

California Air Resources Board

**Public Hearing to Consider Amendments to the
Low Carbon Fuel Standard**

**Final Statement of Reasons for Rulemaking,
Including Summary of Comments and Agency
Response**

**Attachment 2 - Table 2
April Workshop Comments**

*Public Hearing Date: November 8, 2024
Agenda Item No.: 24-6-2*

Submitted Comment

Name

Peter Jordan

Affiliation

H2 Energy Group

Subject

Green Hydrogen-Need a simple way to understand available LCFS

Message

H2 Energy group takes biomass and produces green H2. The biomass is removed by forest management companies from the forest floor. No clear cutting. Just removing the 165 M dead, down and diseased trees in CA. There is no combustion of the biomass. Our pyrolysis process produces syngas (65% H2). We use the syngas to power our production. We do not connect to the GRID. No water or electricity feedstock, just biomass. We perform our own carbon capture in the form of biochar. we filter the syngas to meet Fuel Cell standards. The projected CI score is -118! Yes a negative number!

With a tribal community from Redding, we are partnered to build a production site in Red Bluff. We will be producing 12Metric tons/day of green H2. The CA Hydrogen market needs supply and CARB needs it to be green. How do we figure out our LCFS credit, if any? Happy to discuss the details when ever you'd like. Thanks for listening. Peter

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- My name is Scott Hedderich, and I work for Nuseed, a global agriculture company enabling the transformation of select crops, like carinata, into renewable and traceable sources of lower-carbon energy.

I have 2 points and a question

- 002.1
- First point. On sustainability, Slide 58 lists guard rails and strategies. We would ask CARB to look at adding as a listed strategy a move utilize innovative intermediate cover crops like Carinata - which is a crop not intended for food use and is grown on winter fallow ground. By reference, Europe has been a leader in this area as their recent proposed changes to their annex IX (9) demonstrate - obviously we would like to see California follow a similar path

- 002.2
- Slides 61 and 62 - CARB could be implying that feedstock suppliers would be working with directly with CARB on sustainability certification. Currently, biorefiners seeking pathways work directly with CARB and involve the feedstock suppliers in the process when and where appropriate and that would include auditing and 3rd party verification. At the end of the day, though, the pathway lies with the refiner and they “own” that process.

- 002.2 cont'd
- **Question 1:** Moving forward, are we looking at two parallel processes here or something else that is nested within the pathway process itself?

- **Second point** slide 61 states “Feedstock providers interested in participating in the LCFS will select a CARB approved certification system.” Section § 95502 lays out qualifications and on page 276 of the proposal it states verifier(s) must have experience similar to RSB or ISCC or Bronsucro”.

- 002.3
- So, I am assuming staff is going to develop a list of approved certifiers, similar to the approved auditors and 3rd party verifiers. If so based on past experience, Nuseed would ask that the process developing that list moves as *quickly* as possible. Also, depending on how staff move forward, I want to point out there could be a potential issue here in

- 002.4
- that work with these certification bodies doesn’t envision a rotation component the way work with auditors do.

We’ve been working with RSB for a number of years and would happy to share our learnings with you.

- Lastly, this is a tremendous amount of work, and you all should be proud of your efforts. We looking forward to working with staff as they continue to develop the details around the sustainability provisions

April 11, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95814

Dear Members of the Board:

The Methanol Institute appreciates the opportunity to offer these written comments on the California Air Resources Board (CARB) Proposed Amendments to the Low Carbon Fuel Standard (LCFS) regulations. I was one of the on-line Zoom attendees yesterday that did not get an opportunity to provide oral comments. During a discussion during the technical workshop in response to a comment regarding the use of methanol as a fuel for harbor craft, CARB staff noted that more data was needed on the use of methanol as a marine fuel, and we would be happy to engage with staff on this point.

The Methanol Institute is a global trade association representing the world's leading methanol producers, distributors, technology companies and consumers. The Methanol Institute's mission is to promote emerging methanol markets and drive the expansion of low carbon and net carbon neutral methanol supply. The use of methanol as a marine transportation fuel aligns with CARB's mission in the LCFS program to encourage private sector innovation to develop a diverse supply of low-carbon transportation fuels in California.

003.1

The Methanol Institute believes the large-scale integration of low-carbon and net carbon-neutral fuels, such as renewable methanol, at an accelerated rate in marine applications, will be fundamental to achieving international targets for GHG reductions in the marine sector.¹ Under the current LCFS regulations, renewable methanol is ineligible for credit generation because it is not identified as an opt-in fuel. Therefore, the Methanol Institute supports amending Section 95482 of the LCFS regulations to ensure that low-carbon intensity methanol is made eligible for LCFS crediting as an opt-in fuel when sold for use in marine vessels. Specific proposed regulatory text is attached in Appendix A below.

CARB has determined that marine transportation is a hard-to-decarbonize sector² that severely impacts local air quality in California's port-adjacent communities.³ Expanding the use of renewable methanol presents an opportunity to both reduce carbon emissions and improve local air quality for traditional pollutants. Compared to conventional fuels such as diesel, renewable methanol cuts carbon dioxide emissions by up to 95%, reduces nitrogen oxide emissions by up

¹ See Methanol Institute, "Components in Measuring GHG Intensity of Marine Fuels," available at <https://www.methanol.org/marine/>.

² See California Air Resources Board, "2022 Scoping Plan," 190, available at <https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents>.

³ See California Air Resources Board, "Interim Evaluation Report – Control Measure For Ocean-Going Vessels At Berth," available at <https://ww2.arb.ca.gov/news/carb-passes-amendments-commercial-harbor-craft-regulation>.



003.1 cont. to 80%, and completely eliminates sulfur oxide and particulate matter emissions.⁴ Amending the LCFS regulations to allow low-carbon and net carbon-neutral methanol to generate credits when used in marine vessels will incentivize the use of renewable methanol over traditional marine fuels, leading to an overall reduction in emissions in the marine transportation sector in alignment with CARB's goals to improve local air quality and address global climate change.

In recent years, demand for methanol as a marine transportation fuel has steadily grown as major shipping companies are building out ship fleets capable of running on methanol. Maersk has now launched their third container ship operating on low-carbon and net carbon-neutral methanol. According to Clarksons (<https://www.clarksons.com/>), there are now more than 250 newbuild methanol vessels on order and set to enter service over the next four years. There have also been more than 100 orders for the retrofit of existing vessels to operate on methanol fuels. Lloyd's Register has estimated that the fleet of methanol-fueled vessels could exceed 1,200 ships by 2030⁵.

Since each of the larger 16,000-24,000 TEU containerships will consume as much as 40,000 metric tons of methanol per year the demand for low carbon intensity methanol will reach tens of millions of tons in the coming years. Since many of these vessels will call on ports in California, it will be critically important for the State to foster the production and bunkering of renewable methanol.

The Methanol Institute strongly urges CARB to include in the final LCFS amendments the ability to generate credits from the use of low-CI methanol as an opt-in fuel for marine vessels under Section 95482. The Methanol Institute thanks CARB for its time and dedication to the LCFS amendment process and looks forward to continued engagement with CARB staff throughout this process. As noted above, we would be happy to help you address data needs around the use of methanol as a marine fuel.

Respectfully,



Gregory A. Dolan
Chief Executive Officer

⁴ See Methanol Institute, "Renewable Methanol," available at <https://www.methanol.org/renewable/>.

⁵ See: <https://www.lr.org/en/knowledge/press-room/press-listing/press-release/renewable-production-needed-to-make-methanol-a-viable-fuel-for-the-maritime-energy-transition/>



Appendix A

17 C.C.R. § 95482 - Fuels Subject to Regulation

(b) Opt-In Fuels. Each of the following alternative fuels ("opt-in fuels") is presumed to have a full fuel cycle, carbon intensity that meets the compliance schedules set forth in sections 95484(b) through (d) through December 31, 2030. A fuel provider for an alternative fuel listed below may generate LCFS credits for that fuel only by electing to opt into the LCFS as an opt-in fuel reporting entity pursuant to section 95483.1 and meeting the requirements of this regulation:

- (1) Electricity;
- (2) Bio-CNG;
- (3) Bio-LNG;
- (4) Bio-L-CNG;
- (5) Alternative Jet Fuel; ~~and~~
- (6) Renewable Propane; ~~and~~
- (7) Renewable Methanol.

17 C.C.R. § 95481 - Definitions and Acronyms

(a) *Definitions*. For the purposes of sections 95480 through 95503, the definitions in Health and Safety Code sections 39010 through 39060 shall apply, except as otherwise specified in this section or sections 95482 through 95503:

(132) "Renewable Methanol" means methanol produced from renewable feedstocks including gasification of biomass (ie., municipal solid waste, forestry residue, black liquor, etc.) or bio-methane/bio-gas (ie., from anaerobic digestion of landfill gas, municipal solid waste, animal manure, etc.) collectively referred to as bio-methanol, or from combining renewable hydrogen (ie, from electrolysis of water using renewable electricity) and carbon dioxide (ie., from biogenic sources, direct air capture, or industrial flu gas CO2 capture and utilization (CCU))





April 11, 2024

Liane M. Randolph, Chair
California Air Resources Board (CARB)
1001 I Street
Sacramento, CA 95814

Submitted Electronically

RE: Low Carbon Fuel Standard Workshop – MTS Comments

Dear Chair Randolph,

On behalf of the San Diego Metropolitan Transit System (MTS), we respectfully submit comments related to the CARB Low Carbon Fuel Standard (LCFS) Workshop held on April 10, 2024. We greatly appreciate your time and consideration to the following comments we have provided in this letter.

MTS has been participating in the LCFS program since 2013, beginning with renewable natural gas fueling 40- and 60-foot buses. Over the years, MTS has included the electrical fixed guideway of the Trolley system, propane buses, as well as battery electric buses. The LCFS program has been a vital source of additional revenue for our agency. The credit proceeds we have received are used to offset operating costs and allow MTS to provide as much service as possible to our community in addition to supporting the deployment of low and zero carbon fuels.

MTS supports moving the amendment package forward and endorses the recommendations provided by the California Transit Association. MTS encourages CARB to consider the following:

- 004.1 1) **Create parity in the credit generation between post-2011 and pre-2010 fixed guideway systems.**
- MTS has a legacy system that was built pre-2010, however it requires constant investment to keep the system in a state of good repair. MTS's main Trolley line, the Blue Line, was completely overhauled and rehabilitated after 2011, at a cost of over \$300 million, yet is still considered a pre-2010 system. MTS also has a new Trolley extension that does qualify as a post-2011 system, and **it generates about three times as many credits as the legacy system yet operates with the same technology in the vehicles and electrification of the entire system. This disparity is creating millions of dollars in potential lost revenue MTS could be putting towards enhancing and growing service.**



004.2 2) **Explore providing a credit enhancement for transit.**

- As a transit operator, MTS faces challenges in the next few years addressing significant operating deficits as well as cost increases related to CARB's Innovative Clean Transit regulation. The consideration of providing a credit enhancement for transit can greatly assist in addressing cost increases seen throughout this industry.

004.3 3) **Streamline mechanics of registering with LCFS and tracking credit generation.**

- Currently, for battery electric bus reporting, every single charger needs to be maintained in the Alternative Fuels Portal, and the quarterly reporting needs to be maintained at the charger level. However, since each charging system has one dedicated utility meter for that system, without any other operational uses, reporting at the meter level would be more straightforward and administratively less burdensome for transit agencies, ultimately saving on staff time and costs.

004.4 4) **Continue to support Renewable Natural Gas (RNG) under LCFS.**

- For MTS, the transition from natural gas buses to battery electric buses will take many years, with a plan to complete the transition by 2040. This is not only due to the life cycle uses of current buses, but also the tremendous investment to install zero-emission infrastructure along with the premium cost factors of electric buses. If RNG is no longer generating credits in the LCFS program, many transit agencies, including MTS, could not afford RNG to fuel its fleet during transition years. This could result in agencies needing to revert to fossil natural gas temporarily to balance cost implications. In order to ensure transit agencies continue to operate the cleanest vehicles, it is critically important to continue to support RNG under LCFS.

Thank you for your consideration of our comments. MTS continues to be very supportive of the program as a whole and looks forward to working with CARB on this rulemaking. If you would like to discuss any of the comments in this letter, please contact Julia Tuer, MTS Manager of Government Affairs, at Julia.Tuer@sdmts.com.

Sincerely,



Sharon Cooney
Chief Executive Officer

cc: CARB Board Members



April 11, 2024

Liane M. Randolph, Chair
California Air Resources Board (CARB)
1001 I Street
Sacramento, CA 95814

Submitted Electronically

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Sincerely,



Sharon Cooney
Chief Executive Officer

cc: CARB Board Members

Comments to California Air Resources Board (CARB) LCFS Public Meeting, April 10, 2024

I am Ross Buckenham, with California Bioenergy LLC ("CalBio"), a developer and operator of CA dairy digesters. Thank you, CARB, for all the analysis and thank you for the opportunity to say a few words.

IPCC reports it is a scientific "fact" that the warming of our global system is due to human activity, and they also report that the methane level in our atmosphere has grown three times faster than carbon dioxide contributing 30% of global warming to-date.

This month we will celebrate Earth Day. Yes I say celebrate, despite:

- 2023 the highest average global temperature since pre-industrial times.
- We are experiencing more frequent extreme weather events
- We see rising sea levels and shrinking Ice caps and glaciers
- And acidifying oceans are impacting our coral reefs and other marine systems

We can celebrate Earth Day because despite the climate crisis we have proven solutions, one of which is that aggressively reducing methane emissions can transform its global warming effect into a global cooling effect. This is due to methane's incredibly short life compared to carbon dioxide's near perpetual life in the atmosphere.

Since agriculture is the largest source of global methane emissions, farmers present the largest opportunity to deliver this climate cooling effect.

It is not a solution to simply produce less food. For example global dairy production will increase 50% by 2030 to meet demand which grows unabated despite the marketing of supposed "non-dairy" alternatives.

CARB recognized this and pioneered and incentivized simple but effective technology, called digesters, to capture dairy methane and convert it into renewable fuel while also supporting affordable dairy production. As a result, CA dairy is well on its way to reducing its methane emissions by a whopping 40% by 2030 as documented in a recent UC Davis study and report.

Dairy methane capture contributes toward global cooling, it recycles a waste into an energy, it allows dairy farms to sustainably maintain their dairy cows which themselves are an important and major recycler, transforming significant quantities of inedible agricultural waste into nutrient-rich, dairy.

Over 100 digesters are currently operational in the CA on approximately 400,000 milk cows. These digesters also reduce odors by removing over 350 tons per year of hydrogen sulfide emissions and in doing so reduces 670 tons of small damaging PM2.5 particles. Overall these 100 digesters are the equivalent to removing 8 million cars from the Central Valley roads. Another 100 need to be built. Hence the need for CARB to step down and steepen the compliance curves to match credit supply with deficits and critically to support dairy RNG pathways to electricity and hydrogen fuels via book and claim.

Dairy methane recycling into fuel,

- displaces fossil fuel consumption and reducing exhaust pipe emissions,
- improves local air and water pollution in surrounding communities,
- supports local clean economies through emission reductions,

- generates high-quality, organic fertilizer for sustainable agriculture,
- creates jobs,
- increases investment in disadvantaged communities,
- is one if not the most affordable way for the state to reduce ghg emissions.

The time for debate and half-measures has passed; the time for even more action is upon us.

California's family farms remain committed and "all in" on their important role of producing the majority of the nation's dairy (and the much of world's) economically and sustainably, creating a cleaner, more reliable and affordable food future for generations to come.

Thank you.

Ross Buckenham

CEO California Bioenergy LLC

Submitted Comment

Name

Eric Mintzer

Affiliation

Gelber Group

Subject

Livestock Methane Regulation Question

Message

It seems possible that a Livestock Methane Regulation could come into force in the next couple of years and before the next LCFS rulemaking. Can you please provide guidance on how the program would respond to a Livestock Methane Regulation as per SB 1383?

- 1) Would a regulation requiring reduced methane emissions on dairies affect Avoided Methane crediting because some avoided methane would no longer be additional?
- 2) Would crediting change for existing credit pathways? Or would it only affect new and renewed credit pathways?
- 3) In judging the additionality of avoided methane emissions from non-California dairies, would California regulations be used as a baseline, or would a dairy's respective local and state level methane regulations be used as a baseline?

Thank you

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Submitted Comment

Name

Shannon Amiot

Affiliation

N/A

Subject

Please exclude factory farm gas from this proposal!!!

Message

The California Air Resources Board (CARB) has proposed rules that allow corporate factory farm dairy and hog operations (anywhere in the country) to sell the methane created in their operations into this system as a supposedly "carbon negative" fuel. METHANE IS NOT CARBON NEGATIVE?!?!?

The current CARB counter-intuitive proposal:

- Commoditizes methane production, legislating publicly-funded (taxpayer dollars through government subsidies) support for gas-polluting practices to grow.
- Incentivizes the expansion of confined animal feeding operations.
- Institutionalizes corporate consolidation in the U.S. livestock industry, out-competing and impeding family farmers.
- Continues the overproduction of remote commodities, flooding the market and pushing down prices that would otherwise be invested into local, independent family farms, rural communities, and more effective and palpable responses to climate change.
- Pays foreign multinational meatpackers, like Chinese-owned Smithfield and Brazilian-owned JBS, for their pollution.

Your board knows exactly what they are doing and WE SEE YOU FOR WHAT YOU ARE. Carbon trading has NEVER been a viable solution and only proves "logical" when theoretical economics is the only consideration, leaving out "externalities". In practice, these theories about the economy are proven OVER AND OVER AND OVER AGAIN TO FAIL.

I am sick of your empty words and broken policy and I am sick of corporations seemingly pulling one over the eyes of misguided and oftentimes ignorant "boards of professionals". It's obnoxious and embarrassing.

Aloha

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Submitted Comment

Name

Yaniv Scherson

Affiliation

Anaergia

Subject

Food Scraps Definition Change

Message

The new proposed definition of food scraps is very concerning, restrictive and conflicting with Calrecycle. The last sentence stating what is excluded needs to be deleted. Food scraps now excludes waste streams that are landfilled.

The Food Scraps definition needs to remove the last sentence carve out for these reasons:

Not conflict with Calrecycle

Not set a dangerous precedent with SB 1440 that will exclude food waste feedstock by mere arbitrary carve out in CARB definition

Follow consistent methodology of tracking statewide average of food waste fraction to landfill from all sources.

Issues are that Food Scraps excludes the following:

Liquid waste - many processors convert food waste into liquid form for transportation purposes and compatibility with AD facilities that have hose connections vs solids receiving bins or tip floors. Adding water to landfill food waste suddenly excludes from food scraps. No logical.

Industrial food processing, Manufacturing, Distribution facilities

All these facilities produce food waste and all food waste in California follows statewide average of landfilled fraction. All food waste should be treated the same following statewide average.

The same food waste from manufacturers and distribution centers is sent to grocery stores where wasted food is considered Food Scraps, and same for downstream residential and commercial users. Food waste from these sources is considered food waste by Calrecycle and these generators are subject to the same SB 1383 requirements (they do not get waivers because their food waste doesn't go to landfill, so why would CARB assume all their food waste is 100% diverted?).

Strong recommendation: Remove the last sentence of the definition of food scraps. A definition should state affirmative inclusion, and not exclusions. If a material does not fall in the affirmative inclusion of what Food Scraps is, then by default it is not included. By stating affirmative inclusion and exclusions,

008.1

this introduces confusion if it's in or out.

Second, the 75% landfill capture rate still needs to be changed. In addition to the Oct 2023 EPA paper stating 39% landfill capture for national average this paper from Science is corroborating the same finding the landfills emit far more methane than assumed. The evidence from Nature, Science, and EPA is overwhelmingly clear - 75% is scientifically wrong.
(<https://www.science.org/doi/10.1126/science.adi7735#tab-contributors>)

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Submitted Comment

Name

Jeremy Mall

Affiliation

N/A

Subject

ZEV Definition

Message

009.1

Note that there is no definition for ZEV in the definitions and acronyms section of AB 32. This is a problem because common nomenclature for ZEV is that it's an acronym for "Zero Emission Vehicle" and Staff uses this interchangeably with EVs (the acronym for "electric vehicles") from time to time. This is very confusing to both participants and onlookers

The "ZEV" acronym is a marketing term used by electric vehicle ("EV") manufacturers to brand their vehicles and make them appear cleaner to consumers than they actually are. It is a great marketing ploy because the average consumer does not know the difference between zero tailpipe emissions and zero GHG emissions. They can put a little asterisk that says "zero emission claim refers only to tailpipe emissions" and no one is any wiser. Staff does not have that luxury as AB 32 is a complete cradle to grave GHG policy, making most EVs greater than zero emission due to the use of grid electricity for fuel. Therefore, ZEV and EV acronyms are not interchangeable within the contexts of AB 32.

As it sits today, Staff should define ZEV as zero emission H2 fuel cell vehicles or EVs that only use charging stations connected to off-grid renewable power.

Broadly interchanging the acronyms "EV" and "ZEV" is misleading to participants of program, especially those less familiar with cradle to grave GHG programs. This was especially evident in the most recent workshop when there were multiple comments from the environmental justice community and other NGOs speaking negatively about dairy RNG and its role in AB 32. No grid can run on 100% wind and solar energy and while the California grid significantly lower GHG emission than the rest of the US, it is far from zero. RNG is a key feedstock to decarbonize the CA grid and reduce criteria pollutants in the state. But yet multiple EJ commenters spoke on the fuel as if it were worse than petroleum natural gas. EJ advocates and other NGOs spoke as if grid electricity were already zero emission. In truth, it is nowhere close. Staff need to be more clear with the community about that fact.

It starts with defining ZEV within the proper context of AB 32.

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February 15, 2024

To: California Air Resources Board

Re: Low Carbon Fuel Standard - <https://ww2.arb.ca.gov/rulemaking/2024/lcfs2024>

The Institute for Agriculture and Trade Policy (IATP) welcomes the opportunity to comment on the California Air Resources Board (CARB) proposed amendments to its Low Carbon Fuel Standard (LCFS). IATP is a 38-year-old, non-profit organization with headquarters in Minnesota that works nationally and internationally for fair and sustainable food and trade systems.

010.1

Throughout IATP's history, we have seen firsthand the economic and environmental harm the transition to large-scale confined animal feeding operations (CAFOs) has caused to rural communities in Midwest states. California's LCFS, unfortunately, has contributed to the further expansion of the CAFO system in Midwest states, such as Minnesota and Wisconsin, through its skewed emissions intensity scoring and associated credits for CAFO-derived biogas. An analysis by CoBank concluded that incentives and credits generated through California's LCFS "are the main source of revenue for dairy digester projects."¹ We do not believe biogas projects that subsidize Midwest CAFOs are consistent with California's LCFS intention and purpose: to reduce California's GHGs through its transportation sector by requiring cleaner fuels.

IATP offers the following comments on the LCFS's proposed amendments:

CARB's LCA for biogas excludes significant emissions

010.2

Biogas derived through methane digesters on large-scale CAFOs requires enormous quantities of animal manure. The largest source of direct methane emissions from dairy and beef CAFOs is the animals themselves (at least two-thirds), the remaining emissions (methane and nitrous oxide) come from giant, often liquified, waste lagoons. Hog CAFO emissions come entirely from liquified manure storage. Other greenhouse gas emissions associated with the CAFO system include feed production and the spreading of manure on neighboring fields. Despite the significant emissions coming from the CAFO system, CARB's current emissions intensity analysis gives biogas a negative carbon intensity score, lower than any other transportation fuel, including electricity produced by solar and wind energy which produce no discernable waste, emissions or water pollution.²

¹ <https://sso.cobank.com/documents/7714906/7715329/Interest-in-California-Dairy-Manure-Methane-Digesters-Follows-the-Money-Aug2020.pdf/be11d7d6-80df-7a7e-0cbd-9f4ebe730b25?t=1603745079998>

² <https://ww2.arb.ca.gov/sites/default/files/barcu/board/books/2023/092823/23-8-1pres.pdf>

We urge CARB to reconsider how it calculates its biogas emissions intensity score in the following five areas:

- 010.3 1) The “avoided methane” crediting policy assumes that open air flaring is the only option for dairy, beef or hog producers and that captured methane is an “avoided emission.” This ignores alternative approaches to raising animals (such as on appropriately scaled, pasture-based systems that avoid giant liquid manure lagoons all together) and better manure management (such as lower-emitting dried manure systems). In other words, the CAFO system itself and its management of manure is demonstrably avoidable.
- 010.4 2) CARB’s low score for biogas and ensuing credits incentivizes more manure production from large CAFOs. As farmers struggle through volatile and often below-cost markets, payments for waste production create a new income stream that can subsidize larger herd sizes to produce more manure and access more LCFS credits.³ The growth of CAFOs mean additional direct cow-related emissions. Currently, CARB does not have an effective system to track operations seeking biogas credits that are expanding their herd size (with associated additional methane emissions), or whether the LCFS is helping to finance new CAFOs with additional emissions.
- 010.5 3) The state does not account for several major sources of CAFO emissions within its biogas scoring system. CAFO systems are entirely dependent on low cost (sometimes below cost) feed often from off the farm, just as ethanol or biodiesel are entirely dependent on corn and soy production. The LCA for biogas from beef, dairy and hog CAFOs does not include the significant emissions associated with feed, including nitrous oxide emissions associated with fertilizer use (particularly for corn) and emissions associated with the harvest, processing and transport of feed to the CAFO. The LCA also doesn’t include emissions from cows themselves in the case of dairy and beef. Finally, the LCFS does not count the emissions associated with the application of biogas digestate on the land, which can emit more methane and nitrous oxide than undigested manure.⁴
- 010.6 4) There is growing evidence that CAFOs with biogas digesters are still significant sources of methane emissions. Recent Food & Water Watch research found that 15 California dairies, with biogas digesters receiving credits through the LCFS, emitted enough methane to be tracked by satellite and imaging aircraft.⁵ Other researchers have found that digester systems often leak, leading to an underestimation of their emissions.⁶ Methane leaks from digesters could contribute to as much as a 15% loss rate — cutting into its emissions intensity score and making it impossible to be a net loss emitter.⁷
- 5) CARB doesn’t adequately consider new models of methane digesters, where manure or gas are trucked from several surrounding CAFOs to a centralized digester. For

³ <https://hoards.com/article-30925-energy-revenue-could-be-a-game-changer-for-dairy-farms.html>

⁴ <https://www.sciencedirect.com/science/article/pii/S0167880917300701>

⁵ <https://storymaps.arcgis.com/stories/4b708bdc0d2d419ba34cb352ca79b6e3>

⁶ <https://www.sciencedirect.com/science/article/pii/S2590332222002676>

⁷ <https://iopscience.iop.org/article/10.1088/1748-9326/ab9335>

010.6 cont.

example, a Wisconsin digester project is accessing LCFS credits sources from three local dairies.⁸ A proposed Minnesota digester would collect manure from four dairies in three counties.⁹ Each project includes an enormous amount of additional truck traffic and fuel use to be workable, not to mention the emissions associated with each individual CAFO.

CARB ignores impacts on rural communities outside of California

010.7

One of the stated objectives of the LCFS and associated amendments is “to strengthen equity provisions and promote investment in low income, rural communities....” While the LCFS extends well beyond the boundaries of California, with projects all over the country, CARB’s Standard Regulatory Assessment Analysis notably does not consider rural communities outside of California. We strongly urge CARB to conduct analysis and monitoring of whether low-income, rural communities outside of California are benefiting from biogas investment through the LCFS, including a process for direct public input from community-members.

California’s LCFS has already sent credits to multiple dairy farms in western Minnesota, throughout Wisconsin and in states around the country.^{10,11} Last month, Minnesota’s Public Utility Commission held a hearing in western Minnesota for a \$13.9 million plan for a 28-mile pipeline of methane gas from four local dairies into a nearby natural gas pipeline.¹² The project developers have stated they plan to have California’s LCFS credits help pay for the project. Another digester in western Minnesota is capturing nearly 700,000 gallons of daily manure from three big dairies to power a digester that has partially financed by carbon credits.¹³ Minnesota lost nearly 150 dairy permits in 2023, much of them due to the shift toward larger dairy CAFOs. Biogas digesters are too costly for small and mid-sized dairies, and the economics don’t work for those not located near natural gas pipelines. In essence, CARB’s LCFS system is picking winners and losers in states outside of California.

The phase out timing for biogas credits is too long

010.8

CARB’s current “deliverability” requirements that out-of-state biogas be simply added to a North American pipeline — without assurance that it will be used in California — run counter to the intention of the LCFS and greatly weaken the effectiveness of the policy. The proposed amendments to strengthen the “deliverability” requirement for projects started after 2029,

⁸ <https://investigatamidwest.org/2023/12/22/bio-cash-how-a-cow-powered-controversial-fuel-ingests-wisconsin-clean-energy-dollars/>

⁹ <https://www.mprnews.org/story/2023/09/12/digesters-make-renewable-energy-from-manure-but-face-hurdles>

¹⁰ <https://ww2.arb.ca.gov/resources/documents/lcfs-pathway-certified-carbon-intensities>

¹¹

<https://foodandwater.maps.arcgis.com/apps/mapviewer/index.html?webmap=a40e6dc32bfa4165af469b3a648d4a76>

¹² <https://www.agweek.com/livestock/dairy/minnesota-puc-to-host-meeting-on-13-9m-pipeline-transporting-renewable-natural-gas-from-dairy-farms>

¹³ <https://www.dmt-cgs.com/minnesota-first-rng-plant-amp-americas-dmt/>

with a 10-year grace period, unnecessarily delaying a much-needed fix that could and should happen next year.

010.8 cont.

CARB's own Initial Statement of Reasons (ISOR) admits that biogas takes up only a fraction of vehicle fuel use and that biogas use will decline as zero emission vehicles penetrate the market.¹⁴ There is an acknowledgement that biogas as a transportation fuel will need to transition out of the fuel mix to avoid stranded assets. We agree and would argue that waiting until after 2029 (with an additional 10-year grace period) to phase out biogas crediting is an excessively long period and should be eliminated, particularly for a transportation fuel that depends on waste production and could add GHG emissions in its production.

Guardrails for crop-based biofuels are threatened by Sustainable Aviation Fuels

010.9

A recent National Academy of Sciences paper on life cycle assessments highlighted the critical importance of evaluating scale when assessing different transportation fuels.¹⁵ The proposed amendments open the door for the inclusion of Sustainable Aviation Fuels (SAF) for flights within the state of California. The future of the SAF market is highly speculative. The World Resources Institute estimates that to meet the Energy Department's stated goal on SAF it would require an additional 114 million acres of corn, 20% more than current corn acreage.¹⁶ This type of major expansion in corn production would have a profound effect on land use change. We urge CARB to consider the impact of the additional inclusion of SAFs within the LCFS credit system for California and land use emissions in other states and countries.

The LCFS Amendments Ignore California's own Environmental Justice Advisory Committee

010.10

The state's Environmental Justice Advisory Committee (EJAC) was sharp in its criticism of the current LCFS, including the way CARB has evaluated CAFO biogas. In its comment, the Advisory Committee stated, "The LCFS has exacerbated and entrenched harmful pollution in communities near and regions containing large dairies and other confined animal feeding operations by incentivizing the production, storage, and land application of wet manure."¹⁷ EJAC specifically called on CARB to "Conduct a full accounting of GHG and air pollution emissions associated with pathways relying on the production of fuel from livestock and dairy manure"; "Eliminate avoided methane credits effective January 1, 2024;" and "Eliminate credit generation for pathways relying on the production of fuel from livestock and dairy manure for emissions reductions that otherwise would have occurred or were legally or contractually required to occur." EJAC further recommends that CARB take steps to "immediately initiate formal rulemaking for the regulation of livestock methane."

¹⁴ <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/isor.pdf>

¹⁵ <https://www.nationalacademies.org/our-work/current-methods-for-life-cycle-analyses-of-low-carbon-transportation-fuels-in-the-united-states>

¹⁶ <https://www.wri.org/insights/us-sustainable-aviation-fuel-emissions-impacts#:~:text=If%20the%20U.S.%20were%20to,United%20States%20for%20all%20purposes>

¹⁷ <https://www.arb.ca.gov/lists/com-attach/1-lcfs2024-VjMFaQNjUGABWFA0.pdf>

IATP is supportive of EJAC's recommendations, and we urge CARB to revise its LCFS amendments accordingly.

IATP thanks CARB for considering these comments. Please direct follow-up questions or correspondence to Ben Lilliston at blilliston@iatp.org.

Submitted Comment

Name

Susan Gibson

Affiliation

N/A

Subject

Low carbon fuel standard

Message

Exclude factory farm gas from the Low Carbon Fuel Standard.

Please consider the unintended negative consequences of California's policies on Americans throughout the U.S.

File Upload (i.e., Attachments):

N/A

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Submitted Comment

Name

Paulette Zimmerman

Affiliation

N/A

Subject

Do Not Fuel Factory Farms

Message

Including factory farm gas in California's Low Carbon Fuel Standard would:

Incentivize more corporate factory farms, harming family farmers, rural communities, our environment and climate, in Missouri, the Midwest and across the U.S.

Create more corporate consolidation in the U.S. livestock industry.

Commoditize methane production, which would fuel more methane producing practices.

Create additional overproduction of commodities, pork and milk, increasing supply and further pushing down market prices paid to independent family farms.

Pay foreign multinational meatpackers, like Chinese-owned Smithfield and Brazilian-owned JBS, for their pollution.

Create incentives for the public (taxpayer dollars through government subsidies) to fund anaerobic digesters to capture factory farm gas.

Please consider the unintended negative consequences of California's policies on Americans throughout the U.S.

File Upload (i.e., Attachments):

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Submitted Comment

Name

Dory Colbert

Affiliation

Missouri Rural Crisis Center

Subject

Low carbon fuel standard

Message

013.1

I urge you to exclude factory farm gas from the Low Carbon Fuel Standard. I live in Missouri. Just north of me, JBS has a meat packing plant that this year caused egregious water pollution in the city of Moberly, MO.

Years ago, our state legislature put an initiative on a statewide ballot called "right to farm". Who could argue with that sentiment? It passed. What it really meant was that foreign enterprises could buy Missouri farm land. And they did. Our aquifers and soil are suffering because of it. Now, the state legislature is trying to codify the opposite into state law.

We must start doing the hard work of reversing climate change. The biosphere is collapsing. Excluding factory farm gas from the Low Carbon Fuel Standard is a positive step.

Dory Colbert
Columbia MO

File Upload (i.e., Attachments):

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Submitted Comment

Name

Lea Langdon

Affiliation

N/A

Subject

No Factory Farm Gas for Calif. Low Carbon Fuel Standard

Message

Calif. should NOT allow factory farm gas to be a part of the low carbon fuel standard. To allow it would be to incentivize more factory farms which would have a negative effect on small farmers and rural communities, as well as our environment and the climate. More factory farms would mean more foreign corporations in Calif and across the country, and then we would be paying them for their pollution. Please consider the unintended consequences throughout the country. Do not allow "biomethane" to be included in the Low Carbon Fuel Standard.

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Submitted Comment

Name

Robert Blake Jr

Affiliation

Emeritus Professor of Family and Community Medicine, University of MO

Subject

Low Carbon Fuel Standards

Message

Because of many negative consequences fuels produced by factory farms should not be included in the Low Carbon Fuels Standards. This would defeat the purpose of the standards.

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Submitted Comment

Name

Everett Murphy M.D.

Affiliation

N/A

Subject

CAFO regulation

Message

016.1 Exclude "factory" farm gas from the proposed California "Low Carbon Fuel Standard." The California policy would fuel MORE Factory Farms in the Midwest that are for all practical purposes unregulated with no health protection for the persons living close to them. We do not want unregulated Factory Farms/CAFOs, so don't encourage that.

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Submitted Comment

Name

Victor Purdy

Affiliation

FarmAid, Patchwork family farms.

Subject

Factory farming is a proven recipe for disaster!

Message

China's profits-VS- American sustainability and health.

Who wants meat that stinks like a factory farm evaporation pit anyhow?

Open and smell a package Smithfield meat like i just did and barf reflexes are the result.

More fuel wasted over having to return garbage!

Only The best for my family (sustainability raised meats and organic foods) flavorful and healthy for OUR Country.

Reward sustainable farming practices and not foreign investors seeking to repeat environmental disasters.

Elected officials, Visit a factory farm downwind from the evaporation fountains that spew a mist stinking up nearby towns for hundreds of miles.

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N/A

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Submitted Comment

Name

Sarah Joplin

Affiliation

N/A

Subject

Low Carbon Fuel Standard

Message

Please do not enact rules that allow methane gas created in CAFO dairy and hog operations to be sold into your system as a carbon negative commodity. This is a misguided move which will incentivize the expansion of such operations and compound detrimental environmental and community impacts.

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Submitted Comment

Name

Vic Burton

Affiliation

N/A

Subject

Including factory farm gas in California's Low Carbon Fuel Standard

Message

Including factory farm gas in California's Low Carbon Fuel Standard would:

Incentivize more corporate factory farms, harming family farmers, rural communities, our environment and climate, in Missouri, the Midwest and across the U.S.

Create more corporate consolidation in the U.S. livestock industry.

Commoditize methane production, which would fuel more methane producing practices.

Create additional overproduction of commodities, pork and milk, increasing supply and further pushing down market prices paid to independent family farms.

Pay foreign multinational meatpackers, like Chinese-owned Smithfield and Brazilian-owned JBS, for their pollution.

Create incentives for the public (taxpayer dollars through government subsidies) to fund anaerobic digesters to capture factory farm gas.

Please consider the unintended negative consequences of California's policies on Americans throughout the U.S.

There are many negative consequences that come from this illogical and counterintuitive proposal, and here are two of the big ones:

By commoditizing factory farm pollution in California's "Low Carbon Fuel Standard" policy, California would be incentivizing factory farm corporations to continue, and even increase, their methane production causing MORE methane and greenhouse gases, MORE factory farm expansion, MORE water and air pollution, and MORE corporate consolidation.

This proposal would create additional overproduction of pork and dairy, pushing market prices even further down for independent family farms. Currently, overproduction of pork and dairy and resulting low prices have been devastating for independent family farm livestock producers.

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Submitted Comment

Name

Linda Barta

Affiliation

MRCC

Subject

CARB farm methane gas

Message

By commoditizing factory farm pollution in California's "Low Carbon Fuel Standard" policy, California would be incentivizing factory farm corporations to continue, and even increase, their methane production causing MORE methane and greenhouse gases, MORE factory farm expansion, MORE water and air pollution, and MORE corporate consolidation.

This proposal would create additional overproduction of pork and dairy, pushing market prices even further down for independent family farms. Currently, overproduction of pork and dairy and resulting low prices have been devastating for independent family farm livestock producers.

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Submitted Comment

Name

Jack Meinzenbach

Affiliation

Sierra Club

Subject

Stop California from Fueling MORE Factory Farms in the Midwest

Message

Including factory farm gas in California's Low Carbon Fuel Standard would:

- Incentivize more corporate factory farms, harming family farmers, rural communities, our environment and climate, in Missouri, the Midwest and across the U.S.
- Create more corporate consolidation in the U.S. livestock industry.
- Commoditize methane production, which would fuel more methane producing practices.
- Create additional overproduction of commodities, pork and milk, increasing supply and further pushing down market prices paid to independent family farms.
- Pay foreign multinational meatpackers, like Chinese-owned Smithfield and Brazilian-owned JBS, for their pollution.
- Create incentives for the public (taxpayer dollars through government subsidies) to fund anaerobic digesters to capture factory farm gas.
- Please consider the unintended negative consequences of California's policies on Americans throughout the U.S.

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Submitted Comment

Name

Pattie Smetana

Affiliation

Resident

Subject

Carbon fuel

Message

022.1

Do not include factory farms in the low carbon fuel standard. We also do not want our waters polluted like Iowa from Cafo farms. Small family farms are more sustainable for all.

File Upload (i.e., Attachments):

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**MISSOURI
RURAL CRISIS
CENTER**

1906 Monroe St. ♦ Columbia, MO 65201 ♦ (573) 449-1336 ♦ Fax (573) 442-5716

April 24th, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Public Comment, April 10th, 2024 California Low Carbon Fuel Standard Workshop

Missouri Rural Crisis Center appreciates the opportunity to offer these comments following and in response to the April 10th, 2024 California Low Carbon Fuel Standard Workshop.

Missouri Rural Crisis Center is a statewide farm and rural membership organization representing thousands of farm families in hundreds of rural communities. Our mission is *to preserve family farms, promote stewardship of the land and environmental integrity and strive for economic and social justice by building unity and mutual understanding among diverse groups, both rural and urban.*

MRCC strongly urges the California Air Resources Board to exclude all fuels derived from biomethane from dairy and swine concentrated animal feeding operations (CAFOs) from California's Low Carbon Fuel Standard.

Missouri family farmers and rural communities have been displaced, hollowed-out, and depopulated as a result of the corporate consolidation in, and their control of, our food system and U.S. livestock markets, specifically by way of corporate industrial livestock operations.

There are many negative consequences that come from this counterintuitive proposal, and here are two of the big ones:

- By commoditizing factory farm pollution in California's "Low Carbon Fuel Standard" policy, California would be incentivizing factory farm corporations to continue, and even increase, their methane production causing MORE methane and greenhouse gases, MORE factory farm expansion, MORE water and air pollution, and MORE corporate consolidation.
- This proposal would create additional overproduction of pork and dairy, pushing market prices even further down for independent family farms. Currently and over the last 3 decades, corporate overproduction of pork and dairy have resulted in consistently low farm gate prices that have been devastating for independent family farm livestock producers and put hundreds of thousands of U.S. family farm livestock producers out of business.

Furthermore, including factory farm gas in California's Low Carbon Fuel Standard would:

- Pay foreign multinational meatpackers, like Chinese-owned Smithfield and Brazilian-owned JBS, for their pollution.
- Create incentives for the public (taxpayer dollars through government subsidies) to fund anaerobic digesters for multinational extractive corporations to capture factory farm gas.

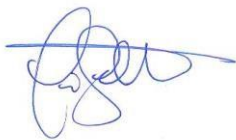
023.1 cont.

The Air Resources Board should not further entrench CAFO pollution in our communities and further tilt the scales against family farmers struggling to hold onto what meager share of the livestock market they have left.

On behalf of our 5,000+ family farm members, we ask that you reform this pollution trading scheme that inflicts harm on our communities. We urge you to reform the LCFS to exclude all fuels derived from factory farm gas.

Thank you for your time and please let me know if you have any questions.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Tim Gibbons', with a long horizontal stroke extending to the right.

Tim Gibbons
Missouri Rural Crisis Center
1906 Monroe St., Columbia, MO 65201
(573) 449-1336
tingibbons@morural.org

Submitted Comment

Name

Cynthia Babich

Affiliation

Del Amo Action Committee

Subject

Low Carbon Fuel Standards

Message

No bio or renewable diesel.

024.1

We are seeing increases in diesel emissions in our West Carson Community and recent premature deaths at early 40. Increase the timeline to compliance and the investment in polluting trucks will decrease.

Cynthia

File Upload (i.e., Attachments):

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Submitted Comment

Name

Yaniv Scherson

Affiliation

Anaergia

Subject

Food Scraps Definition Change

Message

The new proposed definition of food scraps is very concerning, restrictive and conflicting with Calrecycle. The last sentence stating what is excluded needs to be deleted (page 13 of the LCFS rule making, 2nd attachment). Food scraps now excludes waste streams that are landfilled.

The Food Scraps definition needs to remove the last sentence carve out for these reasons:

Not conflict with Calrecycle

Not set a dangerous precedent with SB 1440 that will exclude food waste feedstock by mere arbitrary carve out in CARB definition

Follow consistent methodology of tracking statewide average of food waste fraction to landfill from all sources.

Issues are that Food Scraps excludes the following:

Liquid waste - many processors convert food waste into liquid form for transportation purposes and compatibility with AD facilities that have hose connections vs solids receiving bins or tip floors. Adding water to landfill food waste suddenly excludes from food scraps. No logical.

Industrial food processing, Manufacturing, Distribution facilities

All these facilities produce food waste and all food waste in California follows statewide average of landfilled fraction. All food waste should be treated the same following statewide average.

The same food waste from manufacturers and distribution centers is sent to grocery stores where wasted food is considered Food Scraps, and same for downstream residential and commercial users.

Food waste from these sources is considered food waste by Calrecycle and these generators are subject to the same SB 1383 requirements (they do not get waivers because their food waste doesn't go to landfill, so why would CARB assume all their food waste is 100% diverted?).

Strong recommendation: Remove the last sentence of the definition of food scraps. A definition should state affirmative inclusion, and not exclusions. If a material does not fall in the affirmative inclusion of what Food Scraps is, then by default it is not included. By stating affirmative inclusion and exclusions, this introduces confusion if it's in or out.

025.1

Second, the 75% landfill capture rate still needs to be changed. In addition to the Oct 2023 EPA paper stating 39% landfill capture for national average this paper from Science is corroborating the same finding the landfills emit far more methane than assumed. The evidence from Nature, Science, and EPA is overwhelmingly clear - 75% is scientifically wrong.

(<https://www.science.org/doi/10.1126/science.adi7735#tab-contributors>)

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May 3, 2024

Matthew Botill
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Subject: Comments on the Low Carbon Fuel Standard Workshop

Dear Mr. Botill:

Thank you for the opportunity to comment on the April 10th California Low Carbon Fuel Standard (LCFS) Workshop. The LCFS is one of the most powerful climate change policies in the world, uniquely supporting a wide array of innovative, low-carbon fuel production pathways. Its success has proven a model for similar programs that are emerging in other states and countries. We strongly encourage the California Air Resources Board (CARB) to amend the program in a manner that protects and builds on its successful, technology neutral and science-based approach to ensure the program continues to drive innovation and greenhouse gas reductions for decades into the future.

About Ductor

Ductor was founded in 2009 with the ambitious aim of creating a solution that would help solve today's environmental challenges in the energy and agriculture sectors. Today, we build, own, and operate turnkey microbiological facilities, turning organic resources from the agricultural sector into sustainable fertilizers and biogas. With two plants in Mexico and Germany and numerous projects in the pipeline, we are living up to our purpose and unlocking bio-resources to make food sustainable and energy clean.

Ductor's technology transforms nitrogen-rich organic resources from agriculture, aquaculture, and other organic sources into energy and fertilizers. We specialize in feedstock that cannot be used directly in conventional anaerobic digestion and biogas facilities. This feedstock is fed into the Ductor pre-process, where an IP-protected consortium of microorganisms and the IP-protected Ductor process converts them via fermentation and subsequent ammonia recovery into organic and sustainable liquid nitrogen fertilizer. The feedstock is further processed via anaerobic digestion to generate biogas, which is upgraded to pipeline quality. The digestate is further processed into additional fertilizing and soil-improving products.

Ductor's technology targets the poultry sector, which is growing globally to meet the increasing demand for meat and egg products. According to the USDA, as much as 1.4 billion tons of manure is produced annually by the 9.8 billion head of livestock and poultry in the United States. Sustainable and alternative treatment options for this growing waste stream are needed to address environmental and emissions impacts associated with poultry litter management, storage, and land application.

CARB Should Increase the Step-Down to at Least 9%

Ductor appreciates CARB hosting the April workshop to, among other things, re-evaluate the targets associated with the program. As described in our previous comments related to targets and stringency of the program,¹ Ductor supports a stronger step-down, and encourages the step down to take effect as soon as the amended regulation does – including potentially for a portion of 2024.

Since CARB proposed regulatory amendments in December, the credit bank has continued to grow, and credit prices continue to stay low. According to the most recent program data released by CARB,² at the end of 2023, the credit bank stood at 23.5 million credits, and it grew by a net of 8.2 million credits in 2023. If the bank grows by a similar amount in 2024, the cumulative credit bank would stand at nearly 32 million credits by the end of 2024.

According to the analysis presented at the workshop,³ a 9% step-down would remove 27 million banked allowances through 2046. *This means that even the highest step-down under consideration would not clear the existing credit bank over the lifetime of the program.* We fear this is insufficient to correct the market, especially with the modest proposed 2030 targets, which would strengthen the target less over the next 5 years than a 9% step-down would do in a single year.

026.1

Accordingly, we encourage CARB to continue analyzing near-term targets (the step down and 2030 targets), including consideration of the potential impacts of step-downs of greater than 9% and 2030 targets of greater than 30%. In particular, we support targets in-line with analysis by ICF, which suggests a step-down of 10.5-11.5% is appropriate, as well as 2030 targets of greater than 40%.⁴

Still, while we support even greater levels of stringency that align with the ICF analysis (and which would only support California's climate change goals), we believe the following would be an appropriate, conservative baseline approach for CARB to consider, at a minimum:

- A 9% step-down, to take effect as soon as the regulation does
- Maintain the proposed rate of annual reductions from 2025-2030 in the proposed amendments (2.25 percentage points), which on top of a 9% step down, would take stringency from 22.75% in 2025 to 34% in 2030.

026.2

¹ <https://www.arb.ca.gov/lists/com-attach/6505-lcfs2024-VDBXJFIwUXZQOQh6.pdf>

² See LCFS Dashboard, Figure 3. <https://ww2.arb.ca.gov/resources/documents/lcfs-data-dashboard>

³ See slide 45, <https://ww2.arb.ca.gov/sites/default/files/2024-04/LCFS%20April%20Workshop%20Slides.pdf>

⁴ <https://www.arb.ca.gov/lists/com-attach/7078-lcfs2024-VDVcNFlyVGsLdFQu.pdf>

026.2 cont. We note that, under this framework, if the auto acceleration mechanism (AAM) were triggered twice by 2030, and post-2030 stringency remained as proposed (an increase of 4.5 percentage points annually), the 2030 target would reach 43%, which the ICF analysis has shown to be reasonably achievable, and would better align with the state's economy-wide greenhouse gas reduction goals.

Responses to Request for Stakeholder Feedback

We appreciate CARB requesting additional feedback on the stringency of the program and design of the AAM, and we offer the following responses to the questions posed at the workshop (slide 49).

- **Short-term vs long-term market conditions – how should staff approach the increased stringency need? Is it a onetime near-term need or do stakeholders anticipate rapid and sustained decarbonization progress through the next 10+ years?**

As identified in the ICF analysis, there remains tremendous market interest and opportunity for innovation in low carbon fuels through 2030 and beyond. Ductor, and our technology, are clear examples of this. We have a growing pipeline of projects that we hope deploy in support of California's climate change and other environmental objectives, which would bring additional volumes of low carbon fuels to the state. Completing this pipeline of projects will take years, and requires decades-long vision of reasonable market returns to support financing and project development. Other renewable fuels projects and investments identified in the Scoping Plan (e.g., carbon capture and sequestration, direct air capture, sustainable aviation fuels, etc..) are in a similar position, and likely need to see a market through at least mid-Century in order to support near-term development.

026.3 Accordingly, we encourage CARB to approach increased program stringency as an ongoing need. Each element of the proposed targets (2025, 2030, 2045) is important, and deserves thorough analysis to ensure it aligns with the Scoping Plan and the state's climate change priorities. As described above and further below, we believe this includes:

- A stronger 2025 step-down, of at least 9% and likely 10.5-11.5%
- A stronger 2030 target, of at least 34%, and likely 40+%
- A responsive AAM that is able to quickly correct program stringency if/when the market continues to overperform

We expect the 2045 target deserves further analysis, as well, but we believe the current 2045 proposal is appropriate for now. While long-term targets are important to provide an ongoing signal and vision for the program, there will be additional time to evaluate the 2045 target as part of future rulemakings.

- **Which approach can provide a smooth/sustained market signal to support deeper decarbonization in the 2030s?**

026.4

We believe a strong 2030 target is critical to ensuring a smooth and sustained mid- to long-term market signal. We urge CARB to re-evaluate 2030 targets and ensure that the stringency of the program in 2030 aligns with the State's climate goals (i.e., a 48% economy wide reduction in greenhouse gas emissions).

If the State wants to succeed in meeting its climate change targets, it needs to plan to succeed. Setting appropriately strong targets that align with the State's climate change goals, rather than relying on the AAM to potentially get there, is critical to achieving the outcomes identified in the Scoping Plan. This likely requires a 2030 target of at least 40%, and likely closer to the 48% economy-wide greenhouse gas reduction target.

The AAM is also an important new element of the program, and one that will support a smooth and sustained market signal in both the 2020s, and 2030s.

- **Should staff consider any changes to the trigger conditions for the AAM?**

026.5

Yes. We reiterate our previous comments and encourage CARB to include in 15-day changes adjustments to the AAM that would allow it to be more responsive to market conditions, while still retaining its conservative design. Specifically, we encourage:

- Moving the AAM forward a year, so that it reviews 2025 data and can be potentially triggered in 2026 and take effect in 2027
- Remove the restriction against applying it in consecutive years
- Lower the trigger to no more than 2-2.5x quarterly deficits, per ICF's recommendation⁵

A responsive AAM will best support a smooth/sustained market signal and help avoid boom/bust cycles in investment that might otherwise come if AAM triggers are too slow to respond to market need and lead to long periods of low credit prices (the result of which is likely to be periods of credit price spikes, if low credit prices lead to a period of underinvestment in clean fuels production.)

Other Items for 15-Day Changes

Finally, we wish to reiterate additional comments we offered on the proposed amendments, which we hope CARB will address through 15-day changes:

026.6

- The LCFS has proven one of the most powerful programs in the world for reducing potent short-lived climate pollutants. It similarly can be applied to reduce even more potent N₂O emissions. **Tier 1 calculators, especially for organic waste, should include accounting for avoided N₂O emissions.**

⁵ <https://www.arb.ca.gov/lists/com-attach/7078-lcfs2024-VDVcNFlyVGsLdFQu.pdf>

- 026.7
- Protecting technology neutrality and enabling innovation is central to the success of the LCFS. *We recommend minor 15-day changes, as specified in our previous comments,⁶ to ensure new biogas pathways, including from poultry litter, are clearly supported by the regulation.*
- 026.8
- Avoided methane crediting and book-and-claim access for biogas projects are central to enabling biogas projects and associated emissions reductions. *We urge CARB to avoid restricting avoided methane crediting or biogas book-and-claim accounting in the program.*

Conclusion

We very much appreciate your work, and the work of other CARB staff, to engage stakeholders throughout this process. We understand the wide array of issues related to the LCFS program that are under consideration for amendments, and we appreciate your efforts to strengthen the program and advance California's climate change and related objectives.

Thank you for your consideration of these comments, and please do not hesitate to reach out with any questions.

Sincerely,

Bernard C. Fenner
CEO Ductor Corporation, President Ductor Americas, LLC

Ductor Americas, Inc
1200 18th Street NW
Suite 700
Washington, District of Columbia
20036

⁶ See pp. 4-5: <https://www.arb.ca.gov/lists/com-attach/6505-lcfs2024-VDBXJFIwUXZQOQh6.pdf>

Submitted Comment

Name

Cindy McCarthy

Affiliation

Citizen and voter in California

Subject

Factory Farm Gas proposal in Low Carbon Fuel Standards

Message

Exclude Factory Farm Gas from California's "Low Carbon Fuel Standard" legislation:

To include this would create and bolster incentives to generate more methane gas! And at a time, ironically, when we have come to realize its massive deleterious effects on the earth's health.

Inherently harmful, the methane incentive would additionally, reward Chinese-based Smithfield and Brazilian -based JBS for their pollution! We would be paying them to pollute more!

This would also harm California farmers by consolidating corporate farming and bringing prices down by flooding the market even further than currently.

Our factory-farming is a deplorable industry already, so cruel and embarrassing as a enlightened population - California must do what it does best: LEAD THE NATION , remain in the vanguard showing and teaching the moral way to live.

Thank you for your attention,

Cindy McCarthy

File Upload (i.e., Attachments):

N/A

(800) 242-4450 | helpline@arb.ca.gov
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P.O. Box 2815, Sacramento, CA 95812



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May 3, 2024

Clerk's Office
California Air Resources Board
1001 I Street
Sacramento, California 95814

Comments of Center for Sustainable Energy® regarding the California Air Resources Board's (CARB's) Low Carbon Fuel Standard (LCFS) Workshop

Center for Sustainable Energy® (CSE) appreciates the opportunity to provide comments regarding CARB's proposed amendments to the LCFS, as discussed during the Public Workshop held on April 10, 2024.

CSE is a national nonprofit that accelerates adoption of clean transportation and distributed energy through effective and equitable program design and administration. Governments, utilities, and the private sector trust CSE for its data-driven and software-enabled approach, deep domain expertise, and customer-focused team. CSE's fee-for-service business model frees it from the influence of shareholders, members, and donors, and ensures its independence. Our vision is a future with sustainable, equitable and resilient transportation, buildings, and communities. CSE provides these comments based on our experience designing, implementing, and evaluating statewide incentive programs in California, Connecticut, Illinois, Massachusetts, New Jersey, New York, Oregon, and Vermont, which collectively translates to over \$1 billion worth of program value under management. In California, CSE administers the Clean Vehicle Rebate Project (CVRP) on behalf of CARB, the California Electric Vehicle Infrastructure Project (CALeVIP) on behalf of the California Energy Commission (CEC), and the Pre-Owned EV Rebate Programs, which are funded by LCFS holdback credit revenues, on behalf of the investor-owned utilities (IOUs).

028.1 CSE generally supports CARB's proposed amendments to the LCFS program, including the proposals to strengthen carbon intensity (CI) targets and facilitate zero-emission vehicle (ZEV) adoption by providing additional credit generation opportunities for medium- and heavy-duty (MHD) ZEV infrastructure. CSE encourages CARB to continue providing targeted support to disadvantaged and low-income communities by maintaining the current administrative structure for the holdback credit projects implemented by the IOUs. Accordingly, CSE offers the following recommendations:

1. Strengthen CI reduction targets to stabilize credit prices and provide market certainty.
2. Support ZEV deployment by expanding capacity credit pathways to MHD infrastructure.
3. Maintain the 10 percent administrative cost cap for projects funded by holdback credits.

CSE's responses are discussed in detail below.

1. Strengthen CI reduction targets to stabilize credit prices and provide market certainty.

028.1 cont. CSE supports CARB's proposal to strengthen the CI reduction targets and expand these targets out to 2045. These actions will help stabilize LCFS credit prices and provide long-term certainty to the transportation fuels market in California. Strengthening CI targets may also encourage other jurisdictions with clean fuel standards to adopt more stringent reduction goals. Additionally, CSE supports CARB's proposed Automatic Acceleration Mechanism, which will accelerate the CI targets once certain conditions are met. This will enable CARB to respond to changes in the transportation fuel market without the need for a formal rulemaking process, while simultaneously driving progress towards California's climate and clean transportation goals.

028.2

2. Support ZEV deployment by expanding capacity credit pathways to MHD infrastructure.

028.3

CSE strongly supports CARB's proposal to expand the Fast Charging Infrastructure (FCI) capacity credit pathway to operators of MHD charging infrastructure. This action will provide fleet operators and charging providers with upfront revenue to offset the high capital costs of deploying MHD charging infrastructure. Additionally, this capacity credit pathway will provide an additional tool to assist fleet operators in complying with the requirements of the Advanced Clean Fleets and other fleet-focused regulations. CSE also supports CARB's proposal to make these capacity credits available for operators of privately-owned infrastructure since MHD vehicles are generally more reliant on privately-owned infrastructure than light-duty vehicles.

028.4

CSE does not support CARB's proposal to limit MHD capacity credits to infrastructure installed at locations that are within one mile of a ready or pending Alternative Fuel Corridor (AFC) or adjacent to existing truck parking. CSE acknowledges and appreciates that CARB has proposed these limitations in order to maximize air quality benefits to those communities impacted by truck pollution, which disproportionately tend to be disadvantaged and low-income communities. However, CSE highlights that many MHD infrastructure sites will likely already be located in these communities, regardless of whether this limitation is adopted. Additionally, imposing such a limitation may prevent infrastructure deployment at other ideal locations, including warehouses and distribution centers, which may not be near an AFC or an existing truck parking site but may still provide air quality benefits to disadvantaged and low-income communities. CSE highlights that these geographic limitations on MHD infrastructure sites eligible for capacity credits have also been opposed by the Coalition for Clean Air¹ and Southern California Edison (SCE).² Accordingly, CSE does not recommend CARB adopt this limitation.

¹ Coalition for Clean Air, Amendments to the Low Carbon Fuel Standard, February 16, 2024, at 2-3.

² Southern California Edison, SCE Support for Low Carbon Fuel Standard Regulation Amendments with Some Proposed Modifications and Clarifications, February 20, 2024, at 6.

3. Maintain the 10 percent administrative cost cap for projects funded by holdback credits.

028.5

CSE strongly encourages CARB to maintain the 10 percent administrative cost cap for IOU projects funded by LCFS holdback credit revenues, rather than reducing these caps to five percent, as proposed in Section 95483(c)(1)(A)(5)(c). CSE supports CARB's efforts to ensure that holdback credits support disadvantaged and low-income communities, including the proposal to increase the percentage of residential base credits directed towards holdback projects and the proposal to increase IOUs' minimum investment in these communities. However, reducing the administrative cost cap for holdback projects may undermine the goal of supporting disadvantaged and low-income communities. Equity-focused incentive programs often have higher administrative costs than incentive programs for the general market because additional resources may be needed to identify potential applicants, ensure they meet specified eligibility criteria, and provide the support necessary to complete incentive applications. Specifically, equity-focused incentive programs may require case management and technical assistance services to support those applicants who have the greatest need but are the most difficult to target. Additionally, these programs often benefit from partnerships with community-based organizations (CBOs), who must also be compensated for their work in identifying and supporting priority applicants and informing program design and implementation. All of these factors can result in higher administrative costs. CSE notes that SCE made a similar point in its comments, highlighting that administrative costs nearly tripled in 2021 when SCE began implementation of the holdback credit program offering used EV incentives for low-income individuals.³ Accordingly, CSE suggests that reducing the administrative cost caps for holdback projects may lower program participation and limit overall program effectiveness.

Conclusion

CSE appreciates the opportunity to provide these comments in response to CARB's LCFS Workshop. CSE commends CARB's efforts to improve the LCFS and advance California's transportation, emissions reduction, and equity goals.

Sincerely,



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³ *Id.* at 3.

May 6, 2024

Ms. Liane M. Randolph
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: California Air Resources Board's Potential Changes to the Low Carbon Fuel Standard

Dear Chair Randolph,

Iwatani Corporation of America (ICA) would like to thank the California Air Resources Board (CARB) for the opportunity to comment on the potential changes to the Low Carbon Fuel Standard (LCFS) program. ICA owns and operates several hydrogen refueling stations across California and is rapidly expanding to serve the fast-growing hydrogen market in California and the U.S. Although the plans are not public yet, we are working on some very large heavy-duty projects that are expected to be shared in the near future. Since 1941, Iwatani has regarded hydrogen as the ultimate clean energy source and have consistently engaged in initiatives to encourage its widespread use. ICA is committed to support the zero emissions vehicle (ZEV) market by expanding the fueling infrastructure and supplying hydrogen to both light-duty and heavy-duty vehicles. Under the corporate slogan "A world where all enjoy true comfort – this is Iwatani's desire," we strive to solve environmental concerns with the aim of achieving a carbon free society through the use of hydrogen.

Iwatani has submitted multiple comment letters asking CARB to increase the stringency of the CI reduction targets through 2030 which will balance the demand and supply of LCFS credits in the market and increase the LCFS credit price. We want to reiterate that the revenue from the LCFS credits plays a critical role in economic feasibility of operating ZEV infrastructure and with the current LCFS credit price, it is very challenging to make an investment case for building and operating a hydrogen station for both light-duty and heavy-duty vehicles. Developing and expanding ZEV infrastructure requires time and we strongly believe that the investment in ZEV infrastructure should happen now to make sure we achieve the ZEV mandate goals. Hence, strengthening carbon intensity targets and providing long-term

029.1

029.1
cont.

price signals from CARB will create stability in the LCFS credit market and bring more investment into ZEV infrastructure expansion. ICA believes that the proposed CI reduction target (i.e., 30%) will not be enough to restore and stabilize the LCFS credit price and appreciates the opportunity to revisit the CI reduction targets to ensure the proposed amendments by CARB staff will actually make the change and restores the LCFS credit price. Based on our internal modeling as well as ICF's study¹ the CI reduction target of 30% by 2030 will result in significant oversupply of LCFS credits and overflowed credit bank which will eventually result in fairly unstable and low credit prices. Therefore, ICA urges CARB to consider a greater CI reduction target, at least 40% by 2030, implements a higher CI step down (9%), and enable auto acceleration mechanism (AAM) to restore and stabilize the LCFS credit price faster and jumpstart the investment in production of clean fuels and expansion of ZEV infrastructure.

Sincerely,

Hossein Tabatabaie

Director of Product Management

¹ ICF (2023). Analyzing Future Low Carbon Fuel Targets in California. <https://ww2.arb.ca.gov/form/public-comments/submissions/4306> [accessed 4.29.2024]



May 6, 2024

Carolyn Lozo, Chief, Low Carbon Fuels Standard
Matthew Botill, Chief, Industrial Strategies Division
California Air Resources Board
Per email: LCFSWorkshop@arb.ca.gov

Dear Ms. Lozo and Mr. Botill:

We were gratified to note, when CARB postponed the March 21st hearing on the Low Carbon Fuel Standard program, that your reasons included:

Staff continues to receive substantial feedback on the proposed regulatory package and is postponing the March hearing *to enable additional discussion and re-evaluation of the carbon intensity benchmarks...*

With this letter, we submit comments on three significant points regarding the “avoided emissions” carbon intensity benchmarks of the LCFS.

The first looks at the effect that high negative carbon intensity credits are having on the development of green electrolytic hydrogen in the LCFS, and the potential deleterious national effects related to Treasury rules on use of these “methane offsets.” *Avoided emissions credits could allow fossil-based hydrogen to qualify for clean hydrogen tax credits.*

The second looks at the counterfactual that is at the basis of awarding negative credits. And the third looks at the effects on assumptions about livestock biogas carbon intensity in the context of empirical leakage rates.

030.1

We have submitted a petition to CARB asking that the regulations for livestock methane required in SB 1383 be implemented.¹ If this were to occur, it would automatically eliminate the avoided emissions credits for California operations – except those with existing contracts. Regulation could be innovative, as in the Union of Concerned Scientists proposal for a Low Carbon Milk Standard.² With regulation in place, LCFS could, and should require biogas from other states to be regulated as well in order to participate in the LCFS.

030.2

Alternatively, the LCFS could simply eliminate all avoided emissions credits, except for existing contracts, starting in 2025. This is fully justified based on the fact that the many government and private subsidies, including LCFS, have turned livestock biogas into a commodity. Capture of biogas has become “business-as-usual” and thus should not qualify for avoided emissions CI scores.

¹ https://actionnetwork.org/user_files/user_files/000/106/944/original/2024-03-01_Petition_to_regulate.pdf
a slide presentation is at: <https://my.visme.co/v/319j003r-zz6wqv#s1>

² <https://blog.ucsusa.org/jeremy-martin/something-stinks-california-must-end-manure-biomethane-accounting-gimmicks-in-its-low-carbon-fuel-standard/#:~:text=“The%20carbon%20intensity%20of%20dairy,on%20characteristics%20of%20the%20di>
gester. Feb. 15, 2024.

In addition:

- 030.4 • CARB should recalculate carbon intensity scores for livestock biogas. Recognizing biogas as a commodity means that milk and methane should be treated as co-products in a life-cycle assessment (LCA).
- 030.6 • Require monitoring of controlled and fugitive emissions for digesters and biomethane plants. A mature set of technologies exists to accomplish this.³
- 030.7 • Change LCA standards to penalize leakage levels that make biogas carbon intensive – including nitrous oxide emissions from spreading of the digestate.
- 030.8 • Correcting the spurious avoided emission carbon intensity scores will allow CARB to award the lowest score, and greatest value, to clean, renewable electricity, and accelerate the LCFS goal of supplanting biofuels with electricity. Providing a credit multiplier for zero-emission fuels would also accelerate this shift.
- 030.9 • CARB should work with the cap-and-trade program, the Energy Commission, and the Legislature to establish a statewide policy incentivizing green electrolytic hydrogen that meets the three pillars standard. Only hydrogen produced this way should be incentivized by the state.

Lest we forget:

“Without substantial reductions, GHG emissions from the global food system alone would make 1.5°C an impossible temperature limit. Food systems account for ~33% of global GHG emissions, and livestock production alone accounts for ~50% of that amount despite delivering just 18% of calories and 37% of protein to the global food system. *By 2030 alone, on a business-as-usual trajectory, emissions from the livestock sector will take almost 50% of the GHG emissions budget consistent with limiting global temperature rise to 1.5°C.*”⁴

Thank you for your consideration of these comments, and the attachment.



Daniel Chandler, Ph.D.
350 Humboldt
Steering Committee



Janet Cox, CEO
Climate Action California



Will Brieger,
350 Sacramento
Legislative Team

³ Odeh, N., and M. Abu-Ebid. "Methodology to assess methane leakage from AD Plants_Part I: Report on proposed categorization of AD plants and literature review of methane monitoring technologies." (2016).

⁴ <https://animal.law.harvard.edu/wp-content/uploads/Paris-compliant-livestock-report.pdf>

Comments on the “Avoided Emission” Credits in LCFS

Contents:

A. The dangers of “methane offsets” in the production of hydrogen.....	3
B. LCFS “avoided emissions credits” are a disincentive to developing a green hydrogen industry in California	4
C. The specious nature of “avoided emission” credits for livestock manure biogas capture.....	6
D. The GREET model does not capture all the variables required in order to accurately predict methane and nitrous oxide reduced by anaerobic digesters.	7
E. Avoided emissions credits are not necessary for preserving or incentivizing capture of methane by California dairies.	9

A. The dangers of “methane offsets” in the production of hydrogen

Two well-respected policy analysts, Danny Cullenward and Elizabeth Grubert, have argued that the high carbon intensity scores awarded “avoided emissions” for dairy biogas amounts to a “methane offset.” And that in the context of Treasury’s upcoming rules on 45V tax credits, these may be pernicious.

The logic goes like this: If someone else was going to emit methane to the atmosphere, but agrees instead to capture and inject it into a gas pipeline network, then a hydrogen producer can buy a certificate from that other methane producer representing that same captured gas and potentially treat their *own* fossil gas as negative emissions....Because methane is considered almost 30 times more impactful than CO₂ over a 100-year period, the CO₂- equivalence of avoiding methane emissions is larger than the project’s direct CO₂ emissions, and therefore the resulting hydrogen production process gets a negative carbon intensity score.

“Without methane offsets, fossil hydrogen projects couldn’t benefit much from the hydrogen [IRA 45V] tax credit; even with strict carbon capture and storage pollution controls, they can’t meet the life cycle requirements for the top tier and would likely prefer to claim a smaller carbon storage tax credit instead. But if projects can use methane offsets, they can easily reduce their calculated emissions to qualify for the top tier of the hydrogen production tax credit. This would also mean these fossil projects could undercut truly clean hydrogen projects.

“Remarkably, a fossil hydrogen project without carbon capture could qualify for the top production tax credit by offsetting just 25% of its fuel use. And a fossil hydrogen project that abates 90% of its CO₂ emissions could earn the top tier of the tax credit if it bought offsets for just 4% of its fuel use.”⁵

⁵ Emily Grubert & Danny Cullenward. “The New Hydrogen Rules Risk Opening the Door to Methane Offsets: Having a true green hydrogen industry depends on that not happening.” February 09, 2024. <https://heatmap.news/climate/hydrogen-tax-credit-final-methane-offsets>

030.10 cont. Cullenward and Grubert are making this point in the context of tax credits for hydrogen producers when the goal is to get a brand-new industry of green electrolytic hydrogen off the ground in only a few years. Methane offsets, pre-eminently those of the LCFS, threaten to allow fossil fuel companies to divert these tax credits to hydrogen produced by steam methane reformation (SMR). Thus, what began as a well-intentioned attempt to reduce transportation emissions in California while also abating agricultural methane has turned into a model that threatens the national development of green electrolytic hydrogen!

B. LCFS “avoided emissions credits” are a disincentive to developing a green hydrogen industry in California

California’s goal should be, like that of the federal government, to incentivize green hydrogen. What is meant by green hydrogen? The Treasury has provided several tiers, with much higher incentives for electrolytic hydrogen powered by new renewables (additionality) that are co-located and matched in time with production. Unfortunately, the LCFS has none of the guard rails that Treasury is considering and as a result is incentivizing fossil-based hydrogen but not green electrolytic hydrogen. It should not matter that LCFS incentivizes hydrogen production in the specific context of transportation. There should be *one* California-wide policy to incentivize green electrolytic hydrogen that follows the three pillars.⁶

030.2 cont. It is arguable whether, as in the IRA, somewhat higher carbon intensity production methods should also be incentivized but to a lower extent. Hydrogen made from methane using SMR has a carbon intensity of double what the IRA will incentivize. So that should clearly not be a candidate, but hydrogen made from gasification of woody biomass from forest residues might be a candidate based on lower carbon intensity and social usefulness. Through the wonders of chemistry there are actually many pathways with lower carbon intensity than SMR-based hydrogen. Climate Action California, however, believes that only green electrolytic hydrogen should be *incentivized* by the state of California. That is the only way the clean hydrogen industry we need will come into being.

Under the LCFS currently, hydrogen producers using SMR and other carbon intensive production methods are incentivized because they can buy avoided emissions credits allowing them to offset the emissions associated with carbon intensive hydrogen production which otherwise entail penalties or they can use dairy biomethane as a feedstock.

Table 1, below, shows the feedstocks used in producing hydrogen credited under the LCFS.⁷ Each feedstock is associated with a particular average carbon intensity. Those using methane from livestock digesters have an average negative carbon intensity of at least -200. Note that of the 116 pathways, only one is for green electrolytic hydrogen and its carbon intensity is rated at

⁶ Additionality, co-location and time-matching are referred to as “the three pillars,” and they appear to be certain in the Treasury Departments 45V rules for the highest tier of subsidies (\$3 per kg of H₂ with a carbon intensity of 0.45 kgCO₂e/kg H₂). The lowest tier eligible for subsidies earns only \$0.60 and must meet a 4 kg CO₂e/kg H₂ standard. See: <https://www.resources.org/common-resources/how-can-hydrogen-producers-show-that-they-are-clean/> The carbon intensity common for SMR hydrogen is in the neighborhood of 9 kg CO₂e/kg H₂. <https://www.iea.org/data-and-statistics/charts/comparison-of-the-emissions-intensity-of-different-hydrogen-production-routes-2021>

⁷ The data in Table 1 and Table 2 are from the publicly available LCFS files, accessed December 6, 2023: https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/fuelpathways/current-pathways_all.xlsx

zero, far above the negative scores for manure feedstocks. Of the 116 facilities 89% are in California.

Table 1: Carbon intensity⁸ of LCFS pathways⁹ for hydrogen, by feedstock

Feedstock	N	Mean of Carbon Intensity
Any Other Feedstock (998)	1	88
Dairy Manure (026)	39	-202
Fossil NG & Landfill Gas	2	44
Grid Electricity (039)	2	164
Landfill Gas	2	-9
Landfill Gas (025)	24	112
North American Fossil NG (031)	30	142
North American NG	1	166
North American Natural Gas	1	151
Sodium Chlorate Production Process	1	56
Solar Electricity via Electrolysis	1	0
Swine Manure (044)	6	-354
Wastewater Sludge (030)	2	93
Zero-CI Sources (037)	4	11
Total	116	-17

030.2 cont. Above, 45 of 116 hydrogen pathways use livestock manure as a feedstock (39%). Though comprising less than half of the pathways, it is enough to make the whole hydrogen production system in the LCFS have a mean negative carbon intensity score.

Below we present the same table limited to those pathways where hydrogen is made by steam methane reformation.

Table 2: Carbon intensity and feedstock for the 74 pathways using Steam Methane Reforming to produce hydrogen.

Feedstock	N	Mean of Carbon Intensity
Dairy Manure (026)	30	-201
Landfill Gas (025)	16	107
North American Fossil NG (031)	19	141
North American Natural Gas	1	151
Swine Manure (044)	6	-354
Wastewater Sludge (030)	2	93
Total	74	-46

⁸ *Energy Economy Rate-adjusted Carbon Intensity (gCO₂e/mj) – amount of carbon emitted in producing and consuming a megajoule of energy.

⁹ For the purposes of this analysis we used all of the LCFS data. Many of these pathways, however, have been retired, including 37 whose fuel category is “hydrogen.” In short, the tables show an overview of the history of the program, not just the currently active pathways.

Livestock manure is a feedstock for 49% of hydrogen producers using SMR.

030.2 cont. The difference in carbon intensity between using fossil methane and methane from manure is extreme, showing the effects of a mistaken “avoided emissions” counterfactual. There is no difference in the physical methane used as a feedstock or the hydrogen produced – just the “magic” of avoided emissions crediting if the feedstock is manure.

C. The specious nature of “avoided emission” credits for livestock manure biogas capture

Regulation and the counterfactual of avoided emissions

There is probably no one who cares about global warming who does not recognize the need to abate methane as quickly as possible. Yet in California the majority of methane emissions are unregulated, coming from livestock and to a smaller extent rice. Overall, out of 115 MMT of CO₂e methane, 63MMT belong to livestock and is unregulated (*2020 Emissions Inventory*).

SB 1383 governs methane and other short-term pollutants in California. It calls for CARB to adopt regulations for livestock methane by 2024. We have submitted a petition to CARB asking that the law be followed. If CARB were following the law, the emissions attributed to voluntary action by dairy and other farmers would already be required, so high negative emissions credits would not be permissible.

030.3

Incentives and the counterfactual of avoided emissions

However, there is another way to view the issue. Matthew Botill posed this question, “If we can achieve the SB 1383 40% reduction by incentives why would we regulate?” So, CARB appears to be viewing incentives as an alternative to regulation but designed to accomplish the same mitigation goal. To that end, many incentives for capturing methane are available. Dr. Kevin Fingerman has looked at all of the sources of funding for digesters.¹⁰ These include cap-and-trade, DDRDP, federal RIN credits, the CPUC, Aliso Canyon Settlement funding, the California Energy Commission, and the federal REAP fund as well as roughly 2.5 billion over ten years through LCFS. (This is not government money, but it would not exist without a government structured program.) The total cost to abate a ton of CO₂e via a digester is \$159 (far above the \$9 cited in the 2022 CARB SB 1383 status report).¹¹ Economist Aaron Smith has calculated that for LCFS, specifically, the cost for abating a ton of CO₂e through the avoided emission credits is \$167.¹² Seemingly CARB thinks that the incentives are sufficient to reduce livestock emissions by the required 40% in 2030. So, in this case very generous incentives (enough to establish a whole new biomethane industry in California) are *substituting* for regulation. If this is the case, though, in what sense should the dairy emissions be considered as voluntary actions to reduce emissions? If there were no government incentives (which amount to about \$28 per metric ton of methane) you could argue that individual farmers who install digesters are in fact avoiding

¹⁰ Wakeman, D. and Fingerman, K. (2023). *Waste stream to revenue stream: calculating the costs and climate impact of California’s investments in dairy digester infrastructure*. Arcata, CA. The work was performed for the Center for Food Safety.

¹¹ California Air Resources Board. *Analysis of Progress toward Achieving the 2030 Dairy and Livestock Sector Methane Emissions Target* (March 2022).

¹² Smith, Aaron. “Cow Poop is Now a Big Part of California Fuel Policy” Energy Institute Blog, UC Berkeley, January 22, 2024, <https://energyathaas.wordpress.com/2024/01/22/cow-poop-is-now-a-big-part-of-california-fuel-policy/>

emissions. But with incentives set so high that CARB top administrators believe they nullify the need for regulations, the concept of avoided emissions does not make sense. In fact, forty-two California dairies are among the 58 earning LCFS credits *and* among those with funding from the DDRDP incentives.¹³ The total reductions in ten years claimed for these 42 dairies by the DDRDP is 9,113,976 MTCO₂e. The point here is not that there is double counting (LCFS does not require additionality) but that for those 42 dairies the farmers had already been paid to reduce the emissions the LCFS claims *it* is avoiding.

030.3 cont.

LCFS is governed by the following provision in the Compliance Offset for Livestock: "Eligible offsets must be generated by projects that yield surplus GHG reductions that exceed any GHG reductions otherwise required by law or regulation *or any GHG reduction that would otherwise occur in a conservative business-as-usual scenario.*"¹⁴ The extensive subsidies available and used by dairies already account for the digester reductions since they "occur in a conservative business-as-usual scenario" of multiple private and government funds independent of LCFS. Investors have turned manure methane from a waste product to a commodity. Dairies with digesters now sell both milk and methane. *The concept of avoided emissions requires a counterfactual that, because of extensive subsidies does not, in fact, exist.*

In summary, since everyone knows methane must be abated, and CARB is specifically required by state law to regulate livestock methane by 2024, no magic dust in the form of "avoided emission" counterfactuals should be permitted. Eliminating "avoided emission" carbon intensity scores would mean the carbon intensity assigned livestock methane would be more in line with that of landfill gas (roughly 53 rather than the -321 average of dairy gas). If, on the other hand, government is providing or arranging for handsome profits for a new industry which makes farmers very interested in making manure methane a commodity, then again the high credits due to avoided emissions should not apply, as the counterfactual is erroneous.

D. The GREET model does not capture all the variables required in order to accurately predict methane and nitrous oxide reduced by anaerobic digesters.

Life cycle effects of digesters must include the entire farm over time.

030.4 cont.

There have now been a variety of studies that show the variability of emissions reductions attributable to anaerobic digesters, including the possibility that emissions are *greater* with a digester. For example, a recent Canadian study¹⁵ found a 27% *increase* in GHG emissions when a digester was added to a lagoon system – primarily due to three times more emissions from digestate when applied to the soil. CARB's model, however, excludes nitrous oxide emissions from land application so this effect is not captured.¹⁶

A second study is of two dairies that installed digesters and monitored them over five years. GHG emissions *increased* over the baseline after two years, probably because food wastes

¹³ We also checked the Pathway 2 applications that are pending LCFS approval at <https://ww2.arb.ca.gov/resources/documents/lcfs-pathways-requiring-public-comments>. Two of five California dairies also had DDRDP grants.

¹⁴ CARB Compliance Offset Protocol: Livestock Projects – Capturing and Destroying Methane from Manure Management Systems. Adopted: November 14, 2014. Our italics.

¹⁵ Maldaner, Lia de Sousa. "A life-cycle assessment of greenhouse gas emissions associated with on-farm biogas production." PhD diss., University of Guelph, 2017.

¹⁶ CARB Compliance Offset Protocol: Livestock Projects – Capturing and Destroying Methane from Manure Management Systems. Adopted: November 14, 2014.

were added as a feedstock without additional protections from fugitive gas leaks.¹⁷ Food waste as a feedstock is not included in the CARB model.

In general, the CARB compliance offset model is very detailed, but the precision is questionable (apart from what is not included in the modeling) as most emissions factors are based on an IPCC Expert Group and only one or two studies. The model has not been updated with results from many more recent studies. The approach by the International Council on Clean Transportation, which focuses on specifying and accounting for uncertainties, is – considering the stakes of the climate crisis – far better than the false precision of the LCFS carbon intensity scores.¹⁸

Life cycle effects of digesters must include the leakage from both the collection system and the biomethane upgrading and distribution system.

The CARB model assumes leakage of 5%. Since leakage over 2% in a natural gas system makes it dirtier than coal, even that amount would seem to be troubling.¹⁹ The 5% is intended to cover leakage at the digester as well as in the upgrade to biomethane. However, the IPCC assumes 10% leakage.²⁰ And the 2008 California Climate Action Registry default value was 15%.²¹

Empirically, average leakage from a study of 23 biomethane plants is 4.6%, with a range of 0.4 to 14.9%.²² A 2020 study judged that methane leaks from the process of making “renewable natural gas” is greater than that from flaring, making RNG a more climate destructive process.²³ A 2011 study of a single technologically advanced digester found large differences in leakage rates over time, with the largest being 26.6 kg CH₄ hr⁻¹.²⁴ This leakage rate range has been explicitly modeled for California digesters using CARB’s emission factor as a baseline. Capture

¹⁷ Debruyn, Zachary, Andrew VanderZaag, and Claudia Wagner-Riddle. "Increased dairy farm methane concentrations linked to anaerobic digester in a five-year study." *Journal of Environmental Quality* 49, no. 2 (2020): 509-515.

¹⁸ Zhou, Yuanrong, Diana Swidler, Stephanie Searle, and Chelsea Baldino. "Life-cycle greenhouse gas emissions of biomethane and hydrogen pathways in the European Union." (2021).

¹⁹ Howarth, Robert W., Methane Emissions from the Production and Use of Natural Gas. In Press, EM Magazine, the peer-reviewed trade journal of the Air & Waste Management Association, for December 2022 issue. <https://foe.org/wp-content/uploads/2023/01/Howarth-Comments-on-Clean-Hydrogen-Production-Standard.pdf>

²⁰ Jeong, Seongeun, Marc L. Fischer, Hanna Breunig, Alison R. Marklein, Francesca M. Hopkins, and Sebastien C. Biraud. "Artificial intelligence approach for estimating dairy methane emissions." *Environmental Science & Technology* 56, no. 8 (2022): 4849-4858.

²¹ The registry is a state-founded nonprofit. The 15% figure, unless proven less, is from: Flesch, Thomas K., Raymond L. Desjardins, and Devon Worth. "Fugitive methane emissions from an agricultural biodigester." *Biomass and bioenergy* 35, no. 9 (2011): 3927-3935.

²² Scheutz, Charlotte, and Anders M. Fredenslund. "Total methane emission rates and losses from 23 biogas plants." *Waste Management* 97 (2019): 38-46.

²³ Grubert, Emily. "At scale, renewable natural gas systems could be climate intensive: the influence of methane feedstock and leakage rates." *Environmental Research Letters* 15, no. 8 (2020): 084041.

²⁴ Flesch, Thomas K., Raymond L. Desjardins, and Devon Worth. "Fugitive methane emissions from an agricultural biodigester." *Biomass and bioenergy* 35, no. 9 (2011): 3927-3935. Flaring was a regular part of the operation of this digester and the high values were found during flaring.

of fugitive methane by digesters was reduced by nearly a third at the high end of the leakage range.²⁵

It might be tempting to compare these leakage rates with the amount released if there were no digester, but the proper comparison is with other alternative fuel sources. That is, dairy gas credits are used to offset fossil fuels, so the leakage must be analyzed in that context. According to Grubert, “The estimated leakage range within which RNG becomes more GHG intensive than FNG is about 9.1–11.1% (GWP-100) or 5.0–6.6% (GWP-20).”²⁶

These leakage studies are based on on-the-ground measurements. The California Methane Survey has found intermittent and persistent leaks from dairy digesters in their aerial study of methane super-emitters.²⁷

030.4 cont.

In some cases, the intermittent emissions can be explained by normal operations (for example, periodic waste flushing at large dairies). In other cases, more persistent activity is apparently due to sustained venting at a small number of anaerobic digesters at dairies and wastewater-treatment plants, or to leaking bypass valves at natural gas compressor stations. We find a similar distribution of persistence (20–35% on average) and emissions in the manure-management, wastewater-treatment and oil and gas sectors.

The International Council on Clean Transportation states, “Using manure biomethane as an example, the GHG intensity of its central case is -30 gCO₂e/MJ. Uncertainty in upstream methane leakage can lead to a range of manure biomethane GHG intensities of -44 gCO₂e/MJ to 72 gCO₂e/MJ.... [C]onsidering the uncertainty in these GHG intensities, manure biomethane might have more limited carbon reduction potential in the 100-year timeframe if methane leakage from its production process is high.”²⁸

If the methane from livestock manure is not voluntarily captured but incentivized as a commodity, as we argue, then not only will the theoretical carbon intensity become positive, but leaks (which are not monitored) diminish the value of using livestock methane to offset carbon intensive fuels (like SMR hydrogen) and should be fully accounted for.

E. Avoided emissions credits are not necessary for preserving or incentivizing capture of methane by California dairies.

030.5

Advocates of the dairy/biomethane industrial complex, like Michael Boccadero, say that digesters would not be feasible without the avoided emission negative carbon intensity scores. This is not true. Before the LCFS negative CI scores for biomethane, the cap-and-trade program funded hundreds of digesters around the country, most producing heat and electricity as well as

²⁵ “We also estimate a CH₄ reduction potential of 83 Gg CH₄/yr, assuming CARB’s EF for AD for these large facilities. When we vary the EF for AD from 3 to 20%, reflecting low to high leakage rates, the CH₄ reduction potential varies from 67 to 91 Gg CH₄/yr.” Jeong op cit.

²⁶ Op cit.

²⁷ Duren, Riley M., Andrew K. Thorpe, Kelsey T. Foster, Talha Rafiq, Francesca M. Hopkins, Vineet Yadav, Brian D. Bue et al. “California’s methane super-emitters.” *Nature* 575, no. 7781 (2019): 180-184.

²⁸ Zhou, Yuanrong, Diana Swidler, Stephanie Searle, and Chelsea Baldino. “Life-cycle greenhouse gas emissions of biomethane and hydrogen pathways in the European Union.” (2021).

products made from digestate. That much more future-friendly model has been eclipsed by the biomethane boom which in turn reflects the avoided emission scores.

030.5 cont. “Renewable natural gas,” even without the avoided emission negative scores has a carbon intensity about half that of fossil methane, so biomethane sold via the LCFS can still be profitable. Dairy Cares reports there are 120 digesters operating and 236 digesters funded in California.²⁹ Only 58 are currently part of LCFS, so clearly the avoided emissions credits are not necessary for digesters to be profitable. Existing digesters have a contractual ten years of assured payment through LCFS. These agreements can be honored.

In short, not only does the counterfactual for using “avoided emissions” negative CI scores fail, but these scores are also not necessary.

030.1 cont. Inadvertently, perhaps, LCFS has at least three tigers by the tail – mega-dairies, biomethane/RNG plants, and dirty hydrogen. The problem for CARB is how to let go before letting go becomes impossible in the face of billion-dollar industry lobbies. We have already seen two legislative attempts to limit avoided methane credits killed, one this year (AB 2870) by a power play which did not even permit the bill a committee hearing. And SB 1420, a very bad dirty hydrogen bill that appears to depend on avoided emissions credits, is already in Senate Appropriations. The best way out, and one that is already legislatively mandated, is simply to regulate all livestock methane.

²⁹ <https://www.dairycares.com/dairy-digesters>



DEPARTMENT OF THE NAVY
COMMANDER NAVY REGION SOUTHWEST
750 PACIFIC HIGHWAY
SAN DIEGO CA 92132-0058

5090
N45 / 097
30 Apr 2024

The Honorable Gavin Newsom
Governor, State of California
1021 O Street, Suite 9000
Sacramento, CA 95814

Subj: PROPOSED LOW CARBON FUEL STANDARD AMENDMENTS – SUPPORT

Governor Newsom,

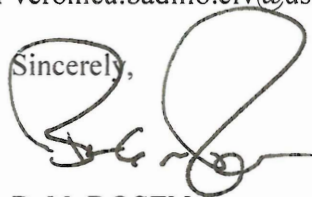
Navy Region Southwest is pleased to express its support for the proposed Low Carbon Fuel Standard (LCFS) Amendments as presented during the public workshop on August 16, 2023 and detailed in the Standardized Regulatory Impact Assessment of September 8, 2023. We appreciate the long-term certainty and benefits of future planning the LCFS provides to the Navy in support of our shared decarbonization goals.

Under the groundbreaking Intergovernmental Support Agreement (IGSA) between the Navy and the Port of San Diego in 2022, proceeds from the sale of LCFS credits are being used to improve and expand energy and utility infrastructure at Naval Base San Diego and the Port of San Diego. The Navy's partnership in this program is the first-ever participation by the Department of Defense in this type of carbon reduction effort.

Since the initial IGSA in 2022, more than \$14.5 million has been generated from the sale of LCFS credits. Commander, Navy Region Southwest plans to expand the IGSA to include two additional bases, Naval Base Coronado and Naval Base Point Loma. This innovative program strengthens the Navy's mission readiness and energy resilience, allows for a consistent funding stream to aide in future planning and execution of utility projects, helps reduce greenhouse gas emissions, and improves air quality around the San Diego Bay.

We appreciate your collaborative commitment to promoting environmental sustainability and your continued support of initiatives to enhance California's air quality. My point of contact for this issue is Veronica Badillo at (619) 247-4437 or veronica.badillo.civ@us.navy.mil.

Sincerely,



B. N. ROSEN
Rear Admiral, U.S. Navy
Commander, Navy Region Southwest

Copy to:
Dr. Liane Randolph, Chair, California Air Resource Board
Dr. Steven Cliff, Executive Officer, California Air Resource Board

031.1

Submitted Comment

Name

Don Gilstrap

Affiliation

Chevron

Subject

Chevron comments on April 10, 2024 LCFS workshop

Message

Please see attached.

File Upload (i.e., Attachments):

N/A

(800) 242-4450 | helpline@arb.ca.gov

1001 I Street, Sacramento, CA 95814

P.O. Box 2815, Sacramento, CA 95812



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Ensuring the growth of the renewable fuels industry in Nebraska

May 3, 2024

Liane Randolph
Chair
California Air Resources Board
P.O. Box 2815
Sacramento, CA 95812
Via electronic submission

RE: Renewable Fuels Nebraska Comments on April 10th LCFS Workshop

Chair Randolph,

On behalf of Renewable Fuels Nebraska, I appreciate this opportunity to offer written commentary on the proposed amendments to California's Low Carbon Fuel Standard (LCFS). Renewable Fuels Nebraska represents a robust community of biofuel producers and advocates, with our membership encompassing all 24 of Nebraska plants producing over 2.2 billion gallons of renewable fuel annually, alongside 55+ associated businesses and numerous supporters nationwide. Our collective mission focuses on enhancing fuel choices for consumers, improving air quality, advancing environmental stewardship, and diversifying our energy sources to bolster green jobs, support family farms, and reduce transportation fuel costs.

Our previous submissions have detailed the critical role that low carbon biofuels and higher biofuel blends play in achieving California's climate objectives. Biofuels have significantly contributed to the LCFS program's success and are well-positioned to continue this trajectory with thoughtful program revisions.

We commend the California Air Resources Board's (CARB) assessment of E15 as a means to reduce greenhouse gas (GHG) emissions and offer economic benefits to California motorists. Since the U.S. EPA sanctioned E15 in 2011, its adoption has surged to 3,400 retail locations across 32 states. This expansion highlights a national acceptance, contrasting sharply with California's current stance, as it remains the only state yet to authorize this efficient and eco-friendly fuel. Should CARB approve and prefer E15 over E10, this switch could equate to removing over 400,000 internal combustion engine vehicles from California roads, all without adverse effects on consumers.

We are also appreciative of CARB's recent updates to the California Transportation Supply (CATS) Model, which now incorporates the benefits of carbon capture



Ensuring the growth of the renewable fuels industry in Nebraska

033.2 utilization and sequestration (CCUS) in bioethanol production. This revision, prompted by incentives in the Inflation Reduction Act, significantly lowers the assumed carbon intensity of E85, facilitating a more substantial GHG reduction in California. The widespread use of E85, particularly in over 1.3 million flex-fuel vehicles within the state, underscores the potential for further emission reductions and supports our advocacy for enhanced FFV production and E85 availability.

033.3 The proposed sustainability certification requirements for crop-based biofuels remain a concern, particularly regarding the perceived indirect land use change (ILUC) impacts. The inclusion of a fixed ILUC penalty seems redundant and punitive, especially given advancements in agricultural productivity and sustainable farming practices. The proposed auditing processes for sustainability also appear to extend beyond the LCFS's scope, potentially imposing unnecessary burdens on biofuel producers without corresponding environmental benefits.

033.5 We also urge a reconsideration of the LCFS provisions regarding low-carbon intensity (CI) power sourcing. Currently limited to hydrogen production, this oversight neglects the substantial CI reduction opportunities available through biofuel production. Allowing bioethanol producers to engage in new low-CI power contracts could significantly advance California's leadership in sustainable energy utilization.

033.6 Finally, we support CARB's initiatives to foster the sustainable aviation fuel (SAF) market, essential for decarbonizing the aviation sector. We encourage ongoing collaboration with SAF stakeholders to expedite the adoption of these crucial fuels.

Thank you again for the opportunity to participate in the April 10th, 2024 workshop. We are committed to collaborating with CARB to ensure biofuels play a pivotal role in creating a more sustainable fuel mix and helping California meet its ambitious climate goals.

Sincerely,

Dawn Caldwell
Executive Director
Renewable Fuels Nebraska



Don Gilstrap
Manager, Fuels Regulations

May 7, 2024

Rajinder Sahota
Deputy Executive Officer – Climate Change and Research
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Dear Ms. Sahota:

Re: April 2024 LCFS Workshop

Chevron appreciates the opportunity to review and comment on the subject Low Carbon Fuel Standard workshop.

Chevron is a major refiner and marketer of petroleum products and renewable fuels in the state of California and a regulated party under the Low Carbon Fuel Standard (LCFS). Chevron is also an international producer of lower carbon intensity fuels with a global integrated procurement, distribution and logistics network and 11 biorefineries in the U.S. and Europe.

Following are our comments on the workshop and additional elements of this rulemaking.

Key Messages

- No science-based case has been made for the need to establish sustainability guardrails.
- If CARB intends to move forward with the proposed deficits for intrastate jet use, then a separate workshop is needed to discuss the inherent compliance challenges.
- A technical workshop on the updates to CA-GREET4.0 is critical to ensure CARB has gathered stakeholder feedback.
- CARB should align the LCFS with Oregon and Washington by allowing exempt applications to voluntarily opt in to the program.

Sustainability Guardrails

As previously noted, renewable fuels consumed in the United States are subject to the Renewable Fuel Standard which has strict requirements around land use, particularly for crop-based feedstocks grown outside of the US and Canada. Therefore, an additional sustainability scheme as part of the LCFS is not necessary.

34.1



Chevron Global Downstream LLC
6001 Bollinger Canyon Rd, San Ramon, CA 94583

34.2 Since CARB asked for input on potential sustainability schemes for review, we suggest including the Canada Clean Fuel Regulation (CFR) as an option in addition to EU RED voluntary schemes. The vast majority of LCFS credit-generating low CI fuels come from US and Canada feedstocks and most of those feedstocks do not participate in an EU RED voluntary scheme today. With the advent of the Canada CFR's land use and biodiversity (LUB) criteria, many of those US and Canada feedstock suppliers are now working on complying with that regulation. Canada's program is similar to the EU RED requirements other than the date for when the land cannot have changed (e.g. January 1, 2008 vs July 1, 2020). Again, the U.S. Renewable Fuel Standard prohibits credit where land use changed after December 2007.

34.3 We do want to note that some Canada CFR compliant feedstocks and some ISCC certified feedstocks are commanding a higher price in the market today than non-compliant ones. CARB adding a sustainability scheme will likely raise costs across lower-CI fuel supply chains.

34.4 One potential positive from a sustainability scheme is that this type of traceability should allow CARB to lower land use change (LUC) values for certain feedstock/fuel combinations. This is similar to the concepts presented on slide 64-65 which discussed higher LUC values for some feedstock/fuel combinations. There is significant ongoing work in US and Canada agriculture to lower the CI of farming practices and produce crops with lower CI profiles. CARB should incorporate these innovative practices to lower the CIs of these feedstock/fuel combinations prior to the proposed January 1, 2028 implementation date.

Intrastate Jet Deficits

34.5 Chevron opposes the proposal to assign deficits to fossil jet fuel used for intrastate flights in California. Because these new deficits can be met with credits from any lower-CI fuel, we do not believe this proposal will achieve the intended goal of increasing the use of alternative jet fuel (AJF). It will instead create a complex and impractical compliance framework that will increase the cost of air travel and affect interstate and international flights as well. We recommend that CARB remove this proposal from the rulemaking and consider other ways to incentivize AJF production and consumption.

34.6 If CARB intends to retain this proposal, it is critical that a technical workshop be held to address the issues with the proposed regulatory amendments. As written, there is no realistic path to compliance.

CA-GREET4.0

34.7 We request that CARB present a technical workshop which goes over the key changes between CA-GREET3.0 and CA-GREET4.0. None of the workshops to date have discussed the model in detail, and we believe it is important for participants in the LCFS program to understand the changes and provide



34.7 contd feedback on them. The CA-GREET4.0 model has an outsized role in the program and will be used for several years to come. A workshop with more technical discussion should be held.

Encouraging Renewables Growth

34.8 There was significant interest expressed during the workshop around encouraging growth in renewables use in the marine sector, in addition to the aviation sector. To promote this growth, we suggest that CARB allow exempt applications in 95482 to voluntarily opt in to the program as is done under Oregon and Washington's programs.

We suggest the following update to 95482(d):

Exemption for Specific Applications. The LCFS regulation does not apply to any **deficit-generating** transportation fuel used in the following applications:

Thank you for the opportunity to comment on these matters. If you have any questions regarding our comments, please contact me at (925) 842-8903 or DGilstrap@chevron.com.

Sincerely,





May 10, 2024

Liane Randolph
Chair, California Air Resources Board
P.O. Box 2815
Sacramento, CA 95812
Via electronic submission

RE: Renew Kansas Biofuels Association Comments on April 10th LCFS Workshop

Chair Randolph:

Thank you for the opportunity to provide written comments regarding the proposed Low Carbon Fuel Standard (LCFS) amendments.

Renew Kansas Biofuels Association is the trade association of the Kansas biofuels processing industry, representing Kansas plants that produce more than 600 million gallons of renewable fuel annually.

Our industry produces ethanol fuels which provide more affordable fuel choices to consumers, while improving air quality and protecting the environment.

We recognize that ethanol has been the number one fuel source that has helped lower the CI score of the gasoline pool in the State of California. And, while not yet authorized for use in California, E15 fuel has helped to accomplish carbon intensity reductions in most other states.

Low carbon biofuels have been among the largest contributors to the success of the Low Carbon Fuel Standard (LCFS) program, and higher blend biofuels can play a vital role in California meeting its ambitious climate goals.

E15 Approval

We applaud the California Air Resources Board's consideration of the role E15 can play in reducing the state's greenhouse gas (GHG) emissions while also providing a cost-savings opportunity for California drivers. Consumers have embraced E15's reputation as a more environmentally beneficial, more affordable fuel.

Since the US EPA approved E15 in 2011, at which time there were *zero* retailers offering it, its availability rapidly expanded to 3,400 retail sites in 32 states. Since then, drivers in America have relied on E15 to drive 100 billion miles.

In contrast, with Nevada, Oregon, the Phoenix metro area, and most recently Montana approving E15 for sale, California remains the only state to have not approved this cost-effective,

035.1

environmentally beneficial fuel that can be used in nearly all the state's 31 million gasoline-powered vehicles.

If CARB approved E15, and replaced E10 with E15, this change would be responsible for the GHG-reduction equivalent of removing more than 400,000 ICE vehicles from California's roads without negatively impacting California drivers.

E85, Flex-Fuel Vehicles, CCUS

CARB's August 2023 updates to the California Transportation Supply (CATS) Model recognize the value of carbon capture utilization and sequestration (CCUS) in carbon reduction during bioethanol production.

035.2

We appreciate CARB's recognition of the bioethanol industry's efforts to further reduce carbon emissions via CCUS, a process incentivized by the Inflation Reduction Act. CCUS provides a pathway to lower carbon intensity (CI) for E85 by reducing the assumed CI score for bioethanol from 66 gCO₂e/MJ to 35 gCO₂e/MJ. This change recognizes the positive impact bioethanol has on California's emissions reduction goals.

Additionally, California's existing approval of E85 has resulted in significant growth of its use in flex-fuel vehicles (FFVs): more than 118 million gallons have been sold at 375 locations across the state in 2023 alone.

California's FFV fleet currently stands at more than 1.3 million vehicles. The use of E85 will promote even greater reductions in GHG emissions and reductions of air toxics.

035.3

We encourage CARB to implement policies that strongly incentivize the production and use of flex-fuel vehicles, as well as continued investment in infrastructure for expanded access to E85.

In doing so, the Board will be achieving multiple goals: improving air quality and GHG emissions, reducing the state's dependence on fossil fuels, and providing consumers with an affordable choice to power their vehicles.

Continued Concerns over Proposed Sustainability Certification

035.4

The proposed sustainability certification for crop-based fuels cites concerns regarding land use change (LUC) factors that are unfounded relative to corn starch bioethanol. In fact, the United States is planting grain corn on roughly the same number of acres as was planted in 1900. At the same time, the per acre yield has increased more than 600%.

035.5

Additionally, the LUC concern is already addressed in the LCFS's CI modeling. Corn starch bioethanol is given an automatic 19.8 gCO₂e/MJ penalty for indirect land use change (ILUC). Adding the proposed sustainability criteria to the current ILUC score amounts to an unfair double penalty for corn starch bioethanol.

035.6

We also believe the 19.8 gCO₂e/MJ score is outdated and not based on the most up to date research. A review of more recent science indicates a decreasing trend in land use values with the newer data indicating values closer to 4 gCO₂e/MJ. If plants are required to certify, then they should be able to use the actual CI of the grain and not be stuck with the 19.8 g/MJ ILUC.

035.7

Further, the details provided in the April 10 workshop will add costly requirements on biofuel producers and farmers. CARB's economic analysis of the proposal does not discuss the sustainability requirement's financial burden of implementation.

035.8

Nor will the requirement allow bioethanol producers to use important tools like climate-smart agricultural practices for CI reduction. Some of these practices include precision application of fertilizer, use of low CI fertilizer, no or low-till farming practices, and the use of cover crops.

The use of these practices for measured carbon reduction is not new, as other state agencies use some of these same practices to reduce the release of soil carbon in the state's natural and working lands.

035.9

Finally, with respect to the proposed sustainability audit, the proposal's audit requirements address issues, while important to environmental and social justice, fall outside the scope of the LCFS. The proposed sustainability audit process would require auditors to conduct: "review of management systems", "review of social practices", and an assessment of the "economic sustainability of the applicant."

From the **LCFS** California Air Resources Board's website:

"Beginning in 2011, the Air Resources Board in California initiated a Low Carbon Fuels Standard (LCFS). The LCFS is designed to decrease the carbon intensity of California's transportation fuel pool and provide an increasing range of low-carbon and renewable alternatives, which reduce petroleum dependency and achieve air quality benefits. The LCFS sets annual carbon intensity standards for gasoline, diesel, and the fuels that replace them, which continually reduce over time."

035.9 cont.

As the LCFS was implemented to lower the carbon intensity of the transportation pool, environmental and social justice goals would not fall within the scope of the rule. For that reason, we would oppose the consideration of issues concerning environmental and social justice for sustainability consideration. If this proposal is adopted, crop-based biofuels would be the only feedstock for which these criteria would be audited.

Expand Access to Low-CI Power Sourcing for Biofuels Producers

035.10

With respect to Low-CI power sourcing, the proposal fails to recognize the carbon-reduction potential in crediting Low-CI power sourcing in biofuels production. The proposal currently only allows this mechanism for hydrogen.

The proposal fails the LCFS' fundamental policy goal of carbon intensity reduction in transportation fuels used in California. Allowing bioethanol producers to source *new* contracted

low-CI power that is not included in a utility resource plan via a power purchase agreement does not impact electricity demand.

035.10
cont.

We would ask that the LCFS allow the purchase of Renewable Energy Credits (REC's) to replace grid electricity at the ethanol plant level. Further, the RECs should not be limited to new renewable energy sources. As the LCFS purpose is reducing the CI of the transportation fuel pool, the LCFS should open that opportunity up to other ways of achieving that goal.

Biofuel production occurs largely in electricity markets outside of California. This renders the argument against expanding low-CI power sourcing due to purported resource shuffling moot. By not expanding this provision to biofuels, it denies the state the opportunity to lead other jurisdictions towards increasing their low-CI power generation capability.

Accelerate the Use of Sustainable Aviation Fuel (SAF)

035.11

As producers of one of the most scalable feedstocks for SAF production, we appreciate the Board's attention to development of this key market through its proposal to remove the exemption for intrastate jet fuel.

We encourage CARB to continue to work with SAF producers, biofuel feedstock producers, and airlines to continue to seek ways to accelerate use of these important fuels to help decarbonize the aviation sector.

Thank you for the opportunity to provide input. The LCFS Program is a critical tool to addressing climate change, and we look forward to working with CARB to ensure the role of biofuels in making California's fuel mix more sustainable and help the state achieve its progressive climate goals through the expanded use of bioethanol.

Sincerely,



Randy Stookey
Senior Vice President of Government Affairs
Renew Kansas Biofuels Association
Randy@Kansasag.org



May 10, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95814

Via electronic submission

Re: Comments on April 10 Low Carbon Fuel Standard Workshop

The Nebraska Soybean Association appreciates the opportunity to provide comments in response to the April 10 Low Carbon Fuel Standard (LCFS) workshop. Nebraska Soybean Association is an affiliate of the American Soybean Association (ASA) and welcomes the chance to engage with the California Air Resources Board (CARB) regarding its most recent workshop.

NSA represents Nebraska soybean farmers on domestic and international policy issues important to the soybean industry. Nebraska ranks 6th nationally producing 278 million bushels of soybeans in 2022. U.S. soybean growers have long been committed to producing the world's food, feed, fuel, and thousands of bioproducts in a sustainable and climate-smart way.

As CARB revises and refines provisions in the Initial Statement of Reasons (ISOR) package Nebraska Soybean Association is pleased to expand ASA's comments provided during the April 10 workshop. Of highest importance is ensuring that sustainability guardrails are workable for the soybean industry. Additionally, Nebraska requests that CARB update soybean land use change modeling that uses 20-year-old data and does not reflect current growing practices. Given the recent federal tax guidance released in April on sustainable aviation fuel, there are also additional opportunities to develop LCFS policies that complement work being done at the federal level rather than create duplicative frameworks that create additional burdens on the biofuels value chain.

Positive Workshop Outcomes

NSA appreciates much of the work that CARB staff highlighted in the April 10 workshop. We agree that the robust public process that CARB has championed throughout the LCFS update work has offered significant opportunities for engagement. The workshop highlighted that liquid fuels will continue to be needed in the transportation sector in California for at least the next decade, and Nebraska Soybean Association believes the role of soy-based biofuels to lower emissions in today's remaining liquid fuel market is vitally important to help mitigate the impacts of climate change. CARB also noted that the Environmental Justice Advisory Committee's proposed agricultural feedstock cap would result in an increase in petroleum diesel usage. We appreciate that analysis done by CARB aligns with ASA conclusions in terms of the negative and perverse impacts of an agricultural feedstock cap.

Looking specifically at soybean oil prices and demand, Nebraska Soybean Association appreciates that CARB explored soybean oil price volatility in recent years and determined that it was not the result of domestic biofuels policy, but instead the result of several factors, including the war in Ukraine, weather, and other market disruptions. Further, CARB dispelled arguments that use of soybean oil for biofuels was impacting food prices and called this argument a "misleading representation" of the interaction between food and fuel. NSA thanks CARB for their work on this and offers ASA and our state association as resources for additional data related to this in the future.

NSA also appreciates CARB's additional attention on waste feedstock integrity. Imports of these feedstocks, especially used cooking oil, have exploded in the past couple of years due to incentives in California's LCFS. During much of this period, used cooking oil (UCO) was worth more than virgin palm oil. The increase in U.S. imports of UCO occurred after the EU started investigating fraud allegations as much of the trade was rerouted to the North American market. NSA encourages CARB to verify the integrity of imported UCO used in the LCFS.

Sustainability Guardrails: Exploring Additional Options

While CARB had mentioned sustainability guardrails broadly before, this workshop was the first time that staff detailed potential sustainability measures required for agricultural feedstocks. Nebraska Soybean Association understands that CARB must balance liquid fuel market demands with environmental sustainability goals in California. However, we believe that it is important to work with the biofuels value chain to develop an outcome that is economically and logistically viable for the industry.

036.1 Unfortunately, the information provided in the ISOR and presented in the April 10 workshop offer limited explanation as to why sustainability guardrails are required for agricultural feedstocks. CARB workshop slides state despite increasing domestic virgin oil supplies and uncertainty about increases in virgin oil biofuel consumption in California, "Guardrails [are] still warranted to reduce risks of potential impacts from increased demand of virgin oils in CA LCFS and inform other clean fuels program design." It is not clear what risks remain that must be addressed. Total land use change risk is captured by the LUC score penalty from the GTAP model¹. From an aggregate standpoint, whether biofuels were produced from a U.S. acre in production in 2007 or thereafter is largely irrelevant for carbon intensity. The total change in the system is the important component. Simply shifting eligibility among domestic acreage only adds costs without a program benefit.

036.2 It is also not clear what is meant by informing other clean fuels program design. Many other programs already account for land use change. We also are uncertain what role California plays in the regulatory affairs of other jurisdictions, like Nebraska. The total land use change in the U.S. for crops cannot exceed late 2007 levels under the federal Renewable Fuel Standard. This provision ensures that total crop acreage in the U.S. cannot expand for biofuels. Furthermore, CARB's Global Trade Analysis Project model for biofuels (GTAP-BIO) assumed 812 million gallons of soy-based biofuels are consumed in state whereas California only consumed 378 million gallons in 2023. Last of all, announcements for crush plant expansion in the U.S. total about a 30% increase in domestic capacity. Even if all of these plants were built, that translates to about 15% of the U.S. soybean crop, and the country currently exports 40 to 50% of the soybean crop.

036.3
036.4 Without clearly demonstrated objectives, it remains difficult to devise suggestions for a program. Furthermore, other biofuels feedstocks consumed in California are generally not held to the same standard where they must prove they did not engage in a behavior that is already accounted for in the life cycle analysis. This in practice drives up the costs of agricultural feedstocks compared to other feedstocks and fuels, such as petroleum. In other words, it discourages the use of renewable diesel relative to diesel, which is detrimental to overall GHG emissions. If CARB insists that sustainability criteria for agriculture must be met, it should look to programs already developed through farmer input

¹ https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/iluc_assessment/iluc_analysis.pdf

036.4 cont. and provide improved scoring for feedstocks that employ sustainability practices to minimize the changes in comparative costs. Based on the criteria outlined in the workshop and proposed third-party audit scheme, Nebraska Soybean Association finds the proposal problematic.

Aligning Sustainability Guardrails with Federal Initiatives

036.5 The recent tax guidance² for sustainable aviation fuel (40B) released by the Internal Revenue Service and Department of Treasury offers insights as to how CARB could offer improved scoring for feedstocks grown employing CSA. The 40B tax credit uses a new GREET methodology (40BSAF-GREET 2024), which shows soybeans offer a 55% emissions reduction, and can improve an additional 5% using limited CSA. The U.S. Department of Agriculture's Climate Smart Agriculture Pilot Program is currently collecting a myriad of outcomes-based data on agricultural improvements from farmers using CSA. Rather than penalizing agricultural feedstocks through an onerous audit system, CARB should consider providing additional emissions reductions to feedstocks employing CSA.

In January, a new Clean Fuel Production Credit (45Z) will go into effect, which we hope will build on the cover crops and no till practices included in 40B. Conservation tillage, crop rotations, sustainable inputs, precision agriculture, and other practices all help produce a more sustainable soybean. These practices are widely used on crop acres throughout Nebraska. Acknowledging the work being done throughout U.S. soybean fields will ensure that CARB does not restrict sustainable feedstocks from its fuel portfolio.

A Critical Need for Stakeholder Engagement

036.6 Any agricultural sustainability criteria that CARB establishes will have significant impacts on how the soy industry and biofuels value chain operates. Hosting one workshop that included sustainability concepts did not provide enough of an opportunity for stakeholder engagement on this topic. Nebraska Soybean Association supports ASA's request that CARB convene a working group of industry stakeholders before finalizing sustainability criteria to ensure that the logistical limitations and financial impacts that could result from this policy are properly considered.

We encourage CARB to convene a working group that includes agricultural feedstock providers, feedstock processors, and biofuels producers to help develop any sustainability provisions that they would be required to implement. This working group should endeavor to flesh out workable sustainability guardrail provisions that CARB can implement by the second quarter of 2025. This would ensure that CARB develop a solution that does not unintentionally limit sustainable lipid-based feedstocks through onerous reporting requirements, while allowing CARB to continue to focus on implementation of the rest of the LCFS update by the end of 2024.

Updating Modeling for Soy Oil Feedstocks

036.7 NSA is also concerned that without a comprehensive update to the GTAP-BIO that CARB utilizes and that relies on 20-year-old data, soy-based feedstocks will be phased out of the LCFS, even though current data indicates a much lower carbon intensity (CI) score. On the one hand, CARB is recommending stringent sustainability guardrails for U.S. soy, but on the other hand is still on track to phase-out soy-based biofuels from credit generation by approximately 2035 or sooner.

² Department of Treasury and Internal Revenue Service. Notice 2024-37.

036.7 cont.

CARB is updating all major models for lifecycle emissions calculations except for GTAP-BIO in this rulemaking. As mentioned above, the soy industry has made vast improvements in sustainability and efficiency over the past two decades, with even greater improvement goals ahead. At the same time, CARB continues to rely on a 2014 model that uses data from 2004. The ILUC score accounts for half or more of the CI score for soy-based biofuels. CARB's current modeling assigns soy biomass-based diesel with an ILUC impact of 29.1g CO₂e/MJ whereas updated results from the model used to calculate ILUC scores indicate a value of between 9 and 10 gCO₂e/MJ for soybeans³. The recently released 40BSAF-GREET 2024 model has an ILUC score of 12.2 for soy-based sustainable aviation fuel in federal programs. The benefits of the LCFS can only be achieved if CI values are accurately captured. If land use change concerns are large enough to justify sustainability guardrails, then the modeling should also be updated to reflect current land use change data. Nebraska Soybean Association urges CARB to update its GTAP model to align with other modeling changes being made.

Conclusion

NSA is encouraged by the continued successes of programs that support the development of cleaner, low-carbon fuels. California's LCFS has in turn supported rural economies that support the soy value chain. We appreciate the work that CARB has done to update and improve the LCFS. However, it is critical that CARB finalizes updates in a way that does not arbitrarily exclude agricultural feedstocks through onerous sustainability guardrails developed without the input of growers.

Nebraska Soybean Association is eager to continue working with CARB to support the role of agriculture in diversifying the fuel supply and supporting cleaner fuel options in California and beyond. On behalf of Nebraska's 23,000 soybean farmers, we appreciate the opportunity to comment and look forward to collaborating with CARB and other relevant stakeholders on implementation of policies that expand the use of soy-based biofuels and market opportunities for soybean farmers.

Sincerely,

Kent Grotelueschen, President

Nebraska Soybean Association

³ Taheripour, F., Karmai, O., and Sajedinia, E. (2023). *Biodiesel Induced Land Use Changes: An Assessment Using GTAP-BIO 2014 Data Base*. Purdue University



May 10, 2024

Clerks' Office
California Air Resources Board
1001 I Street
Sacramento, California 95814

Re: California Air Resources Board Proposal to Regulate Conventional Jet Fuel

Dear Chair Randolph,

In response to the workshop held April 10th, 2024, we are writing to share and restate our serious concern and opposition to the recent California Air Resources Board (CARB) proposal to regulate conventional jet fuel under its Low Carb Fuel Standard (LCFS) Program. We believe the CARB proposal will raise the cost of jet fuel without inducing additional Sustainable Aviation Fuels (SAF) production or use in California, an objective the aviation industry shares with CARB. And further, the proposal to regulate jet fuel is pre-empted by federal law. We encourage CARB to withdraw the proposal to regulate conventional jet fuel and instead establish a joint CARB-industry working group to explore alternative solutions to increase SAF production and use.

037.1 United Airlines, Inc. (United) is committed to reducing its environmental impact and achieving net zero greenhouse gas (GHG) emissions by 2050 without relying on the use of voluntary carbon offsets. Transitioning to SAF is core to this commitment. We have long recognized that scaling up the supply of SAF and achieving net zero GHG emissions by 2050 can only happen by working collaboratively with governments and other stakeholders across sectors. Achieving this ambition for SAF will require new and additional policy incentives, streamlined permitting processes, and close collaboration among governments, the aviation industry, the fuels industry, environmental organizations and others.

Aviation accounts for 2.6% of the U.S. greenhouse gas emissions but 5% of U.S. Gross Domestic Product (GDP) and 4.1% of California's GDP, thus exerting outsized economic impact relative to its share of emissions. U.S. civil aviation firms employ more than 380,000 California-based employees, with an overall economic impact of \$194 billion.¹ Aviation is critical to driving California's economy and its rank as the 5th largest economy in the world, enabling \$114 billion in annual trade flows and underpinning many of California's other significant economic drivers such as agriculture, tourism, manufacturing, banking, technology, and small business.

California has established itself as an early leader in attracting investment, production, and use of SAF through the existing LCFS Program, which provides an opt-in credit for SAF that helps reduce the price difference between SAF and conventional jet fuel. This has enabled United to purchase SAF in California since 2016. Ensuring a healthy and vibrant aviation industry is essential to California's future, and leveraging CARB's early leadership on SAF can enable California leadership in the emerging SAF production industry, creating new jobs and economic development opportunities.

¹ [The Economic Impact of Civil Aviation on the U.S. Economy, State Supplement, US Department of Transportation, November 2020](#)

In its April 10th, 2024 workshop, CARB re-stated that a principle objective of its regulatory proposal is to “Increase the use of alternative jet fuel in the State”. We share that objective as reflected in our company commitment to net zero GHG emissions by 2050 and our US airline industry support for the US government’s SAF Grand Challenge. United, along with other airlines, have clearly demonstrated a strong, enduring market signal for affordable SAF. The challenge remains supply of affordable SAF, not the absence of a market signal by airlines.

With this context, we express our serious concern with the proposal by CARB to regulate jet fuel used for flights within California as an obligated fuel under the LCFS Program. The proposal to eliminate the exemption for jet fuel used on intrastate flights would not result in significantly increased SAF production, availability, or use in California, but would lead to higher jet fuel prices and slow down, rather than accelerate, efforts to increase the state’s SAF production and use. The primary impediment to increased SAF production and availability in California remains the higher cost of SAF for producers and buyers relative to conventional jet fuel and renewable diesel. Whether or not jet fuel becomes a deficit generating fuel has no direct impact on whether SAF is produced or used. As the proposal does not provide a mechanism to reduce the economic disadvantage of alternative jet fuel, it will have no material impact on the availability or use of alternative jet fuel in California.

In addition to not being an effective policy tool to increase SAF production, the proposal seeks to regulate jet fuel and reduce emissions from aviation, both of which are preempted under federal law, a fact that CARB recognized when it exempted jet fuel from the LCFS in 2018.² Aviation, unlike many other industries, is uniquely situated in that other factors such as the safe operation and maintenance of aircraft are of great importance, which the federal government has recognized in the jurisdiction of the FAA and the EPA under the Clean Air Act.

Our mutual interest is to increase SAF production, availability, and use, and the most effective way to accomplish this is to continue the positive, collaborative approach represented by the existing “opt-in” mechanism developed by CARB and the aviation community. Only actual SAF use – not merely the creation of jet fuel deficits – will provide the benefits of SAF desired by CARB, airport communities, SAF producers, and airlines. We urge CARB to reconsider and withdraw the proposal to remove the exemption for jet fuel for intrastate flights, preserve the existing opt-in approach for SAF, and establish a joint CARB-industry working group with stakeholders across the emerging SAF ecosystem to explore alternative policy and voluntary proposals to rapidly increase SAF production, availability and use in California. We look forward to working with CARB on such measures to accelerate SAF deployment.

Sincerely,

Papia Gambelin
Managing Director
Western State Region, Government Affairs
United Airlines

DocuSigned by:

Papia Gambelin

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² CARB stated that “[s]ubjecting aircraft fuels to annual carbon intensity standards would raise federal preemption issues” available at https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2018/lcfs18/isor.pdf?_ga=2.259407882.1202437490.1641231788-253234234.1573227006



May 10, 2024

Rajinder Sahota
Deputy Executive Officer for Climate Change & Research
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: National Corn Growers Association (NCGA) Comments on the April 10 Low Carbon Fuel Standard Workshop

Dear Ms. Sahota and CARB Staff,

The National Corn Growers Association (NCGA) would like to thank CARB staff for their ongoing work on the Low Carbon Fuel Standard (LCFS) and the workshop on April 10 to present potential refinements to the proposed regulatory amendment package.

NCGA represents 40,000 dues-paying corn growers and more than 300,000 farmers who contribute to corn promotion programs nationally. Along with its 50 affiliated state associations and checkoff organizations, NCGA works to protect and advance the interests of corn growers.

NCGA thanks CARB staff for their work to ensure the LCFS program remains true to its intended purpose of decarbonizing California's transportation sector. We appreciate the acknowledgement and reinforcement that biofuels will remain an important and readily available tool in the midterm, especially for legacy fleets, as the state transitions to zero-emission vehicles. While we have valued the thorough process and careful consideration of stakeholder feedback, we urge CARB staff to quickly finalize the proposed regulatory amendment package and bring it to the Board as soon as possible.

NCGA would like to provide the following comments in response to the potential refinements presented during the April 10 workshop:

Increased Step-Down

NCGA appreciates CARB's additional modeling and consideration of increased step-downs of 7% and 9% in carbon intensity (CI). Increasing the step-down to 9%, instead of the originally proposed 5%, is an appropriate value that can reset the current credit-to-deficit ratio and make use of the existing credit bank. The 9% step-down is necessary, as it will remove about 16

038.1

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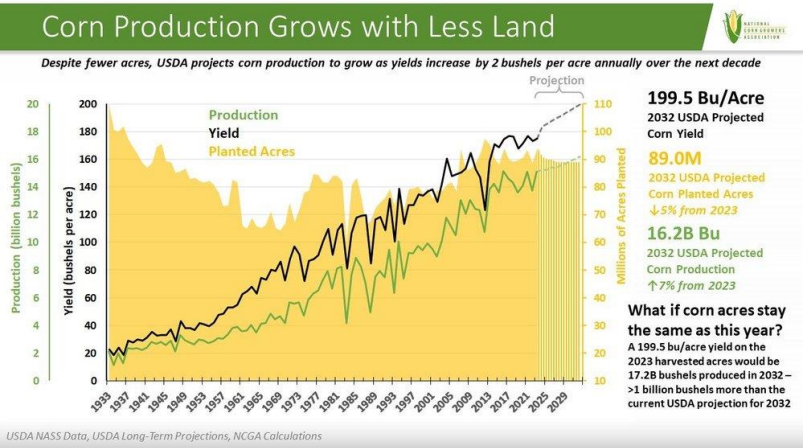
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038.1 cont. million credits from the program, a needed adjustment to stabilize the market and leave an adequate number of deficits in the bank.

Crop-Based Biofuels Sustainability

038.2 In response to the question posed in the staff presentation on Slide 52, increasing biofuel production does not result in food system impacts. Using corn to make ethanol preserves the important nutrients for other uses, including food nutrients. A corn kernel’s starch is fermented to make ethanol with no effect on the kernel’s valuable protein, minerals, vitamins, and fiber used in efficient ethanol co-products such as animal feeds and oils. Land-use is improving as well, with farmers growing more corn on less land and with fewer resources. Since 2007, the average corn yields have increased by more than 25 bushels per acre.¹ On average, the annual increase in corn yield has been 1.8 bushels per acre, per year.² This productivity growth has allowed farmers to meet demand across all uses of corn with significant bushels to spare.

Corn yield growth is attributed to advancements in genetics and plant breeding, enabling the development of better hybrids and parent lines of corn. Agronomic farm management and soil fertility improvements have also contributed to increased yield. Yield increases are expected to continue over the next decade, as the USDA’s long-term projections indicate a two bushel per acre increase each year through 2032.²



038.3 Moreover, we urge CARB to reconsider their sustainability requirements proposal for crop-based biofuels, as it needs additional consideration and consultation with industry. The implementation of such requirements will impose heavy regulatory burdens for credit generators, with much of the responsibility and costs falling on farmers. Specifically, NCGA believes the effort to certify row crop feedstocks to be sourced from non-forested acres after 2008 as unnecessary for domestic crops. If this is pursued, we recommend CARB considers a domestic aggregate compliance approach similar to the monitoring of renewable biomass requirements within the Renewable Fuels Standard (RFS), monitored by U.S. Environmental Protection Agency (EPA).

038.4 Developing a proposal for on-farm crediting to reward improved agricultural practices can be a much more effective solution for tracking sustainability and is what our members have asked for. Incentivizing better farm-level practices through on-farm crediting can lead to tangible reductions in CI scores and support the ongoing goal of lowering CI scores in the LCFS.

¹ [Wrong Again: It’s Time to Get the Facts Straight on Corn Production and Ethanol](#)

² [Rising U.S. Corn Yields Boost Production Without Additional Land](#)

038.5

Also included on Slide 52, staff asked if E15 should be considered to reduce retail gasoline costs. We ask CARB to refer to our written comments on February 20 and encourage the inclusion of E15. Studies show that E15 can save consumers an average of 16 cents per gallon, a significant amount of savings given California's high retail gasoline prices.³ Despite being a climate leader, California remains the only state who has not approved E15, which is not only preventing additional emissions reductions, but will also be a significant obstacle to encouraging other jurisdictions to adopt their own LCFS programs. The E15 Multimedia Evaluation (MME) is in advanced stages and has shown the plethora of value that E15 can bring to California in the form of lower gasoline prices and reduced GHG and criteria pollutants. Ethanol stakeholders have invested significant time, efforts, and money into the MME process over the past six years. The MME is in its final stages, with the stakeholder group awaiting a rulemaking process to commence.

NCGA appreciates the opportunity to engage and provide feedback during this process. We look forward to the finalization of this rulemaking and the implementation of these program amendments.

Sincerely,

A handwritten signature in blue ink, appearing to read "Harold Wolle, Jr.", with a stylized flourish at the end.

Harold Wolle, Jr.
President, National Corn Growers Association

³ [Study: Nationwide E15 Would Save Drivers Over \\$20 Billion in Annual Fuel Costs](#)



May 8, 2024

California Air Resources Board
1001 I Street,
Sacramento, California 95814
Via Electronic submittal

Re: Amendments to the Low Carbon Fuel Standard

To the Air Resources Board:

The Coalition for Clean Air has long supported the Low Carbon Fuel Standard as an essential tool for reducing harmful emissions from the transportation sector, California's largest source of both air and climate pollution. The LCFS supports both the end goal of achieving zero-emission transportation and the interim goal of substituting low carbon renewable fuels for gasoline and diesel during the current period when we still have combustion vehicles on the road. Because of the magnitude of our air pollution and climate crises, we now need the LCFS to both work harder, through greater stringency, and work smarter, by incenting the cleanest fuels and avoiding harms to communities.

Having participated in the September 28 Board hearing, reviewed the December 19 Initial Statement of Reasons and attended the April 10 workshop remotely (although my hand was raised for 3 hours, time ran out before I had a chance to comment), we support both major and minor revisions to the staff proposal. **Most importantly, we are concerned that the absence of a cap on crop-based biofuels jeopardizes the success of the entire LCFS.**

We support the following amendments to the LCFS:

1. Limit crediting of crop-based biofuels.

CARB should establish guardrails to prevent incentivizing conversion of crop lands to fuel production, which exacerbates already-existing food shortages in much of the world. While biofuels made from wastes can provide a net climate benefit, using productive land to produce fuel is detrimental to the climate, because carbon-absorbing natural land elsewhere will be converted into crop production.

At a minimum, CARB should immediately cap lipid biofuels at 2020 levels, to avoid being swamped with soy-based diesel fuels that are shuffled in from other states, depress

039.1

- 039.1 cont. LCFS credit values and provide no additional benefit to our climate, because they are already required for compliance with the Federal Renewable Fuel Standard. Ultimately, these fuels should be phased out of the LCFS.
- 039.2 **2. Increase the stringency of the program, and add an acceleration mechanism.**
Meeting California's greenhouse gas emission caps under SB 32 and AB 1279 will require more rapid progress in phasing out petroleum fuels in the transportation sector, our largest source of climate-changing emissions. Alongside CARB's regulations and incentives for deploying cleaner engines, and the state's as-yet unrealized targets for reducing vehicle miles travelled, the LCFS provides a vital tool for curbing transportation emissions, as reiterated by the 2022 Scoping Plan Update, which calls for a 94% reduction in petroleum use and identifies the LCFS as a key route to that goal. Therefore, we support the proposed standard of a 30% reduction in fuel CI by 2030, and 90% by 2045, with inclusion of an automatic acceleration mechanism as a backstop to assure that the market in cleaner fuels stays at a robust level.
- 039.3 **3. Remove the exemption for aviation fuel by 2026 for both intrastate and interstate flights.**
Conventional jet fuel should be held to the same standard as other petroleum-based transportation fuels. California currently lacks a comprehensive plan for decarbonizing aviation fuels, and including conventional aviation fuel as a deficit generator under the LCFS would help to spur innovation in cleaner fuels and equipment. Cleaning up aviation fuels and equipment will also help protect the health of workers and communities who are most exposed to the emissions from this sector.
- 039.4 **4. Use utilities' base residential LCFS credits to promote equity in zero-emission personal mobility and deployment of clean medium and heavy-duty vehicles.**
LCFS base residential credit proceeds generated by EDUs from electricity used as a transportation fuel should be used to effectively and equitably hasten the adoption of zero-emission electrified transportation, with a focus on disadvantaged and low-income communities. We and our allies are submitting a separate letter on this topic.
- 039.5 **5. Maximize the benefits of the proposed medium- and heavy-duty fast charging infrastructure program by increasing flexibility to better support the deployment of necessary infrastructure.**
CARB regulations, which we support, require a transition to zero-emission engines in buses, trucks and other medium and heavy-duty vehicles. That transition is essential to solving our air pollution and climate crises, and infrastructure challenges are probably the biggest single obstacle to success. Therefore, we support the proposed creation of an infrastructure crediting mechanism for medium and heavy-duty refueling for zero-emission vehicles, both battery-electric and fuel-cell electric.
- 039.6 But the success of the MHD-FCI provision will be constrained by the geographic limitation to projects *"Located within one mile of a reading or pending electric vehicle*

039.6 cont. *Federal Highway Administration Alternative Fuel Corridor or on or adjacent to a property used for medium or heavy-duty vehicle overnight parking, or has received capital funding from a State or Federal competitive grant program that includes location evaluation as criteria.” We recommend expanding the radius to 5 miles, as the 1-mile restriction will undercut program effectiveness, delay deployment, and increase costs for charging and grid upgrades.*

039.7 **6. Allow crediting in the marine sector.**
We urge CARB to allow credits for zero-emission transportation fuels used for ocean-going vessels, and to simplify the process for credits for shore power installations serving electrified harbor craft and for dispensing green hydrogen. The marine sector is a substantial source of emissions in much of the state, and the LCFS can spur conversion to cleaner fuels and support CARB’s regulations of ocean-going vessels and commercial harbor craft.

039.8 **7. Phase out crediting of oil projects.**
California should be planning a transition away from fossil fuels, so allowing credits for oil projects provides a perverse incentive to perpetuate the very problem that the LCFS seeks to solve. These credits should be phased out sooner than the 2040 date proposed by the ISOR.

039.9 **CARB should regulate methane emissions from large dairies.**
This issue is not included within the four corners of the LCFS rulemaking but is related. Dairies are the largest California source of methane, a potent short-lived climate pollutant. CARB should require the large dairies to reduce their emissions of both manure and enteric methane. The regulations should also strive to protect local communities from the adverse impacts of large-scale dairy production.

We look forward to continued discussions as the Board considers the LCFS amendments.

Respectfully,



Bill Magavern
Policy Director
Coalition for Clean Air



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May 10, 2024

Chair Liane M. Randolph
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Via electronic submission Re: Proposed Low Carbon Fuel Standard Amendments

Dear Chair Randolph:

Thank you for the opportunity to comment in response to the California Air Resources Board's (CARB) public workshop on April 10, 2024 and provide additional insights on the proposed amendments to the Low Carbon Fuel Standard (LCFS).

Established in 1907, Bartlett joined the [Savage](#) family of companies in 2018. Its diverse agribusiness is focused on the acquisition, storage, transportation, processing, and merchandising of grain. The company is a leading U.S. exporter of grain to Mexico. Bartlett produces a broad range of flour to meet its Customers' needs and plays an important and growing role in the food and renewable fuel sector with its soybean processing capability. For more information, visit www.bartlettco.com

Our oilseed processing operations yield protein-rich meal for human and animal nutrition, as well as vegetable oil that is used as an ingredient in food manufacturing and as a feedstock for renewable fuels such as biodiesel, renewable diesel and sustainable aviation fuel (SAF). These sustainably produced biofuels help reduce carbon dioxide equivalent (CO₂e) greenhouse gas emissions and the carbon intensity of transportation fuels in use today. Between 2015 and 2021, the soybean industry has seen a 19% decrease in carbon footprint for U.S. soybeans by improving soil health and water quality, increasing yields by 24% while reducing chemical application and implementing no till and expanding cover crops.

We encourage CARB to support the role of agriculture in diversifying the fuel supply through more sustainable feedstocks. The most effective way to do this is by continuing to oppose a cap on vegetable oils.

CARB's additional analysis and remarks delivered at the April 10 workshop rightly recognized a cap or limitation on crop-based oil feedstocks is unwarranted. CARB's findings that renewable diesel and biodiesel have a positive impact on both consumers and the environment clearly underscores the importance of continuing to promote their use as part of California's efforts to achieve its sustainability and air quality goals.

040.1
cont.

As CARB staff pointed out, biomass-based diesel (BBD) has displaced 60% of fossil diesel in California, reducing greenhouse gases, Particulate Matter (PM2.5) and Nitrous Oxide (NOx) emissions.

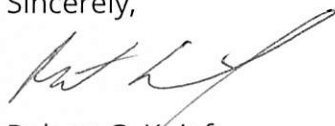
Placing a cap on crop-based feedstocks used to make BBD and other renewable fuels will undo this progress, increasing public health risks and driving up consumer fuel costs. Further, implementing a cap would undercut the necessary investments that are being made to support low carbon feedstocks and further industry expansion.

Internal combustion engines – particularly in the heavy-duty sector – will be on our roads for decades to come. As CARB staff stated during the workshop, California should take advantage of a low carbon fuel that is being produced today at scale by implementing policies that encourage the responsible production and use of renewable feedstocks.

Additionally, as CARB has previously acknowledged, a targeted, risk-based approach to sustainability requirements is encouraged. By accurately assessing deforestation risk, leveraging existing sustainability frameworks such as the Renewable Fuel Standard (RFS), and implementing targeted measures for high-risk regions, CARB can achieve its environmental objectives while also supporting a sustainable and resilient biofuels industry.

Thank you for the opportunity to comment on this important issue.

Sincerely,



Robert G. Knief
President
Bartlett

040.2

May 9, 2024

Chair Liane M. Randolph
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Via electronic submission Re: Proposed Low Carbon Fuel Standard Amendments

Dear Chair Randolph:

Thank you for the opportunity to comment in response to the California Air Resources Board's (CARB) public workshop on April 10, 2024, and to provide additional insights on the proposed amendments to the Low Carbon Fuel Standard (LCFS).

Shell Rock Soy Processing, LLC (SRSP) is an oilseed processing company based in northeast Iowa. Throughout 2021 and 2022 we constructed a new, state of the art, efficient soybean processing facility. We commissioned and became operational in January of 2023, producing protein feed for the livestock industry and vegetable oil for the food and renewable fuels industries. Importantly, SRSP is the first of several new independent entrants in the US, and part of the \$6B in planned capital committed to the growth of capacity for our industry to continue to meet food, feed and fuel needs in our country and abroad. Our investors and lenders committed more than \$300 million to be a part of the large addition of capacity that will continue to connect US grown soybeans to the food and fuels supply chains.

Our oilseed processing operations yield protein-rich meal for human and animal nutrition, as well as vegetable oil that is used as an ingredient in food manufacturing and as a feedstock for renewable fuels such as biodiesel, renewable diesel and sustainable aviation fuel (SAF). These sustainably produced biofuels help reduce carbon dioxide equivalent (CO₂e) greenhouse gas emissions and the carbon intensity of transportation fuels in use today. Between 2015 and 2021, the soybean industry has seen a 19% decrease in carbon footprint for U.S. soybeans by improving soil health and water quality, increasing yields by 24% while reducing chemical application and implementing no till and expanding cover crops.

We encourage CARB to support the role of agriculture in diversifying the fuel supply through more sustainable feedstocks. The most effective way to do this is by continuing to oppose a cap on vegetable oils.

041.1

CARB's additional analysis and remarks delivered at the April 10 workshop rightly recognized a cap or limitation on crop-based oil feedstocks is unwarranted. CARB's findings that renewable diesel and biodiesel have a positive impact on both consumers and the environment clearly underscores the importance of continuing to promote their use as part of California's efforts to achieve its sustainability and air quality goals.

As CARB staff pointed out, biomass-based diesel (BBD) has displaced 60% of fossil diesel in California, reducing greenhouse gases, Particulate Matter (PM2.5) and Nitrous Oxide (NOx) emissions.

041.1 cont.

Placing a cap on crop-based feedstocks used to make BBD and other renewable fuels will undo this progress, increasing public health risks and driving up consumer fuel costs. Further, implementing a cap would undercut the necessary investments that are being made to support low carbon feedstocks and further industry expansion.

Internal combustion engines – particularly in the heavy-duty sector – will be on our roads for decades to come. As CARB staff stated during the workshop, California should take advantage of a low carbon fuel that is being produced today at scale by implementing policies that encourage the responsible production and use of renewable feedstocks.

041.2

Additionally, as CARB has previously acknowledged, a targeted, risk-based approach to sustainability requirements is encouraged. By accurately assessing deforestation risk, leveraging existing sustainability frameworks such as the Renewable Fuel Standard (RFS), and implementing targeted measures for high-risk regions, CARB can achieve its environmental objectives while also supporting a sustainable and resilient biofuels industry.

Thank you for the opportunity to comment on this important issue.

Sincerely,



Corey Jorgenson

CEO

Shell Rock Soy Processing, LLC

Submitted Comment

Name

Darvin Bintlage

Affiliation

Campaign for Family Farmers and the Environment

Subject

Low Carbon Fuel Standard

Message

042.1

Low carbon fuel standard should not include factory farm gases.

This will incentivize more corporate control of factory farms, harming family farmers, rural communities, our environment and climate, in Missouri, the Midwest and across the U.S.

Will create more corporate consolidation in the U.S. livestock industry.

Will commoditize methane production, which would fuel more methane producing practices.

Create additional overproduction of commodities, pork and milk, increasing supply and further pushing down market prices paid to independent family farms driving them out of business.

Pay foreign multinational meatpackers, like Chinese -owned Smithfield and Brazilian owned JBS, for their pollution.

It would create incentives for the public (taxpayers dollars through government subsidies) to fund anerobic digestors to capture factory farm gas. Using public funds for private greed with this false solution.

Recent studies have shown that methane gas contributes to CO2 in the atmosphere when feedback losses and use from production to be comparable to coal use.

Please consider the unintended negative consequences of California's policies on Americans throughout the U.S.

Thank You

File Upload (i.e., Attachments):

N/A

(800) 242-4450 | helpline@arb.ca.gov

1001 I Street, Sacramento, CA 95814

P.O. Box 2815, Sacramento, CA 95812



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Submitted Comment

Name

Ben Steyer

Affiliation

Michigan Soybean Association

Subject

LCFS Comments

Message

see attached comments

File Upload (i.e., Attachments):

N/A

(800) 242-4450 | helpline@arb.ca.gov

1001 I Street, Sacramento, CA 95814

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May 10, 2024

Chair Liane M. Randolph
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Via electronic submission Re: Proposed Low Carbon Fuel Standard Amendments

Dear Chair Randolph:

Thank you for the opportunity to comment in response to the California Air Resources Board's (CARB) public workshop on April 10, 2024 and provide additional insights on the proposed amendments to the Low Carbon Fuel Standard (LCFS).

North Dakota Soybean Processors (NDSP) serves to provide farmer producers with a local, year-round value-adding market for their soybeans. NDSP is a joint venture formed by CGB Enterprises, Inc. (CGB) and Minnesota Soybean Processors (MnSP) to operate a state-of-the-art soybean processing plant, scheduled to open in Summer 2024. The plant will crush 42.5M bushels of soybeans in the first year and produce soybean oil, soybean meal and soyhull pellets.

Our oilseed processing operations yield protein-rich meal for human and animal nutrition, as well as vegetable oil that is used as an ingredient in food manufacturing and as a feedstock for renewable fuels such as biodiesel, renewable diesel and sustainable aviation fuel (SAF). These sustainably produced biofuels help reduce carbon dioxide equivalent (CO₂e) greenhouse gas emissions and the carbon intensity of transportation fuels in use today. Between 2015 and 2021, the soybean industry has seen a 19% decrease in carbon footprint for U.S. soybeans by improving soil health and water quality, increasing yields by 24% while reducing chemical application and implementing no till and expanding cover crops.

We encourage CARB to support the role of agriculture in diversifying the fuel supply through more sustainable feedstocks. The most effective way to do this is by continuing to oppose a cap on vegetable oils.

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CARB's additional analysis and remarks delivered at the April 10 workshop rightly recognized a cap or limitation on crop-based oil feedstocks is unwarranted. CARB's findings that renewable diesel and biodiesel have a positive impact on both consumers and the environment clearly underscores the importance of continuing to promote their use as part of California's efforts to achieve its sustainability and air quality goals.



As CARB staff pointed out, biomass-based diesel (BBD) has displaced 60% of fossil diesel in California, reducing greenhouse gases, Particulate Matter (PM2.5) and Nitrous Oxide (NOx) emissions.

044.1 cont.

Placing a cap on crop-based feedstocks used to make BBD and other renewable fuels will undo this progress, increasing public health risks and driving up consumer fuel costs. Further, implementing a cap would undercut the necessary investments that are being made to support low carbon feedstocks and further industry expansion.

Internal combustion engines – particularly in the heavy-duty sector – will be on our roads for decades to come. As CARB staff stated during the workshop, California should take advantage of a low carbon fuel that is being produced today at scale by implementing policies that encourage the responsible production and use of renewable feedstocks.

Additionally, as CARB has previously acknowledged, a targeted, risk-based approach to sustainability requirements is encouraged. By accurately assessing deforestation risk, leveraging existing sustainability frameworks such as the Renewable Fuel Standard (RFS), and implementing targeted measures for high-risk regions, CARB can achieve its environmental objectives while also supporting a sustainable and resilient biofuels industry.

044.2

Thank you for the opportunity to comment on this important issue.

Sincerely,

Tom Malecha

Tom Malecha
President, North Dakota Soybean Processors



ENTERPRISES, INC.

POST OFFICE BOX 249 / MANDEVILLE, LA 70470-0249 / (985) 867-3500

May 10, 2024

Chair Liane M. Randolph
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Via electronic submission Re: Proposed Low Carbon Fuel Standard Amendments

Dear Chair Randolph:

Thank you for the opportunity to comment in response to the California Air Resources Board's (CARB) public workshop on April 10, 2024 and provide additional insights on the proposed amendments to the Low Carbon Fuel Standard (LCFS).

CGB Enterprises Inc. (CGB) is a progressive leader in the agriculture and transportation industries since 1969. CGB delivers solutions that include everything from buying, storing, selling, and shipping of agricultural products, to global supply chain solutions. Through its subsidiaries, CGB operates a global enterprise with over 1,700 employees at 110+ facilities with access to barge, rail, and/or truck across the Midwest and beyond. The company's entrepreneurial approach has thrived for more than 50 years as CGB has expanded in many new directions, including soybean processing, logistics and transportation, agri-finance, producer risk management, and other related businesses.

CGB's impact to California exists in the work that we do to connect safe and reliable U.S.-supplied organic grain, feed products and oil seeds to the processors and consumers in California. CGB's sustainability efforts center on developing and linking opportunities to incentivize sustainable production practices into U.S. based agricultural production. We are encouraged by CARB's ability to develop and support unencumbered demand for sustainable production attributes in our nation's row crops. We see this as a crucial opportunity to advance and guide the overall rate of practice adoption. CGB looks forward to contributing to these value-added production attributes in our nation's row crop production. Further connecting these sustainable attributes to the food, feed and fuel markets can and will drive their adoption nationwide.

Our oilseed processing operations yield protein-rich meal for human and animal nutrition, as well as vegetable oil that is used as an ingredient in food manufacturing and as a feedstock for renewable fuels such as biodiesel, renewable diesel and sustainable aviation fuel (SAF). These sustainably produced biofuels help reduce carbon dioxide equivalent (CO₂e) greenhouse gas emissions and the carbon intensity of transportation fuels in use today. Between 2015 and 2021, the soybean industry has seen a 19% decrease in carbon footprint for U.S. soybeans by improving soil health and water quality, increasing yields by 24% while reducing chemical application and implementing no till and expanding cover crops.

We encourage CARB to support the role of agriculture in diversifying the fuel supply through more sustainable feedstocks. The most effective way to do this is by continuing to oppose a cap on vegetable oils.

CARB's additional analysis and remarks delivered at the April 10 workshop rightly recognized a cap or limitation on crop-based oil feedstocks is unwarranted. CARB's findings that renewable diesel and biodiesel have a positive impact on both consumers and the environment clearly underscores the importance of continuing to promote their use as part of California's efforts to achieve its sustainability and air quality goals.

045.1 cont.

As CARB staff pointed out, biomass-based diesel (BBD) has displaced 60% of fossil diesel in California, reducing greenhouse gases, Particulate Matter (PM2.5) and Nitrous Oxide (NOx) emissions.

Placing a cap on crop-based feedstocks used to make BBD and other renewable fuels will undo this progress, increasing public health risks and driving up consumer fuel costs. Further, implementing a cap would undercut the necessary investments that are being made to support low carbon feedstocks and further industry expansion.

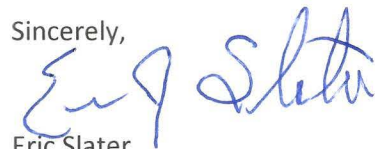
Internal combustion engines – particularly in the heavy-duty sector – will be on our roads for decades to come. As CARB staff stated during the workshop, California should take advantage of a low carbon fuel that is being produced today at scale by implementing policies that encourage the responsible production and use of renewable feedstocks.

Additionally, as CARB has previously acknowledged, a targeted, risk-based approach to sustainability requirements is encouraged. By accurately assessing deforestation risk, leveraging existing sustainability frameworks such as the Renewable Fuel Standard (RFS), and implementing targeted measures for high-risk regions, CARB can achieve its environmental objectives while also supporting a sustainable and resilient biofuels industry.

045.2

Thank you for the opportunity to comment on this important issue.

Sincerely,



Eric Slater
President & CEO
CGB Enterprises, Inc.



59 Greif Parkway, Suite 101 Delaware, OH 43015
740.201.8088 www.ohiocornandwheat.org

May 9, 2024

Rajinder Sahota
Deputy Executive Officer for Climate Change & Research
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Ohio Corn & Wheat Growers Association (OCWGA) Comments on the April 10 Low Carbon Fuel Standard Workshop

Dear Ms. Sahota and CARB Staff,

The Ohio Corn & Wheat Growers Association (OCWGA) would like to thank CARB staff for their ongoing work on the Low Carbon Fuel Standard (LCFS), and the workshop on April 10 to present potential refinements to the proposed regulatory amendment package. OCWGA represents the interest of more than 25,000 corn farmers in Ohio and supports the mission of National Corn Growers Association (NCGA) to create and grow opportunities for America's corn growers.

OCWGA thanks CARB staff for their work to ensure the LCFS program remains true to its intended purpose of decarbonizing California's transportation sector. We appreciate the acknowledgement and reinforcement that biofuels will remain an important and readily available tool in the midterm, especially for legacy fleets, as the state transitions to zero-emission vehicles. While we have valued the thorough process and careful consideration of stakeholder feedback, we urge CARB staff to quickly finalize the proposed regulatory amendment package and bring it to the Board as soon as possible.

OCWGA would like to provide the following comments in response to the potential refinements presented during the April 10 workshop:

Increased Step-Down

OCWGA appreciates CARB's additional modeling and consideration of increased step-downs of 7% and 9% in carbon intensity (CI). We echo the comments being submitted by NCGA which highlight that increasing the step-down to 9%, instead of the originally proposed 5%, is an appropriate value that can reset the current credit-to-deficit ratio and make use of the existing credit bank. The 9% step-down is necessary as it will remove about 16 million credits from the program, a needed adjustment to stabilize the market and leave an adequate number of deficits in the bank.

046.1



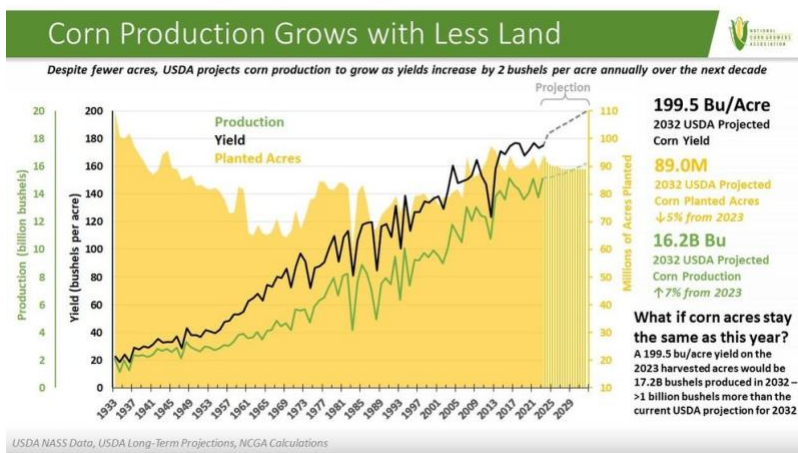
Crop-Based Biofuels Sustainability

046.2

In response to the question posed in the staff presentation on Slide 52, increasing biofuel production does not result in food system impacts. Using corn to make ethanol preserves the important nutrients for other uses, including food nutrients. A corn kernel's starch is fermented to make ethanol with no effect on the kernel's valuable protein, minerals, vitamins, and fiber used in efficient ethanol co-products such as animal feeds and oils.

Land-use is improving as well, with farmers growing more corn on less land and with fewer resources. In Ohio alone, the amount of land in farm usage has declined by 6.4% between 2002 and 2022, representing a loss of nearly 1 million acres of farm land.¹ Yet despite declining agricultural land in Ohio and other states, since 2007, the average corn yields have increased by more than 25 bushels per acre.² On average, the annual increase in corn yield has been 1.8 bushels per acre, per year.³ This productivity growth has allowed farmers to meet demand across all uses of corn with significant bushels to spare.

Corn yield growth is attributed to advancements in genetics and plant breeding, enabling the development of better hybrids and parent lines of corn. Agronomic farm management and soil fertility improvements have also contributed to increased yield. Yield increases are expected to continue over the next decade, as the USDA's long-term projections indicate a two bushel per acre increase each year through 2032.³



046.3

Moreover, we urge CARB to reconsider their sustainability requirements proposal for crop-based biofuels, as it needs additional consideration and consultation with industry. The implementation of such requirements will impose heavy regulatory burdens for credit generators, with much of the responsibility and costs falling on farmers. More specifically, OCWGA asserts that American row crops already meet the demand for domestically sourced feedstocks that do not contribute to deforestation. Since the implementation of the Renewable Fuel Standard (RFS) in 2008, the U.S. Environmental Protection Agency (EPA) has monitored domestic compliance for renewable biomass by adopting an aggregate reporting approach that, if adopted, will simplify CARB's

¹ [New report looks at Ohio agricultural land lost to development](#)

² [Wrong Again: It's Time to Get the Facts Straight on Corn Production and Ethanol](#)

³ [Rising U.S. Corn Yields Boost Production Without Additional Land](#)



046.4

pursuit of meaningful reporting. Developing a proposal for on-farm crediting to reward improved agricultural practices can be a much more effective solution for tracking sustainability and is what corn growers around the country have asked for. Incentivizing better farm-level practices through on-farm crediting can lead to tangible reductions in CI scores and support the ongoing goal of lowering CI scores in the LCFS.

Also included on Slide 52, staff asked if E15 should be considered to reduce retail gasoline costs. **We ask CARB to refer to NCGA's written comments on February 20 and encourage the inclusion of E15.** Studies show that E15 can save consumers an average of 16 cents per gallon, a significant amount of savings given California's high retail gasoline prices.⁴

046.5

Despite being a climate leader, California remains the only state that has not approved E15, which is not only preventing additional emissions reductions, but will also be a significant obstacle to encouraging other jurisdictions to adopt their own LCFS programs. The E15 Multimedia Evaluation (MME) is in advanced stages and has shown the plethora of value that E15 can bring to California in the form of lower gasoline prices and reduced GHG and criteria pollutants. Ethanol stakeholders have invested significant time, efforts, and money into the MME process over the past six years. The MME is in its final stages, with the stakeholder group awaiting a rulemaking process to commence.

OCWGA appreciates the opportunity to engage and provide feedback during this process. We look forward to the finalization of this rulemaking and the implementation of these program amendments. Our growers are proven innovators who continue to produce a bountiful crop while adopting more efficient production standards that meet a wide range of climate smart goals. We welcome the opportunity to, once again, take a leading role in meeting the demands of a new and emerging market.

Sincerely,



Tadd D. Nicholson
Executive Director
Ohio Corn & Wheat Growers Association

⁴ [Study: Nationwide E15 Would Save Drivers Over \\$20 Billion in Annual Fuel Costs](#)





May 9, 2024

California Air Resources Board
Low Carbon Fuel Standard Program

Re: Comments on Proposed Amendments to LCFS Regulation

PineSpire appreciates the opportunity to provide the following comments on the proposed amendments to the LCFS Program and information provided in the April 10, 2024 workshop.

Strengthen Carbon Intensity (CI) Targets and Auto-Acceleration Mechanism (AAM)

047.1 PineSpire appreciates the additional modeling and evaluations provided. In regards to the feedback requested on short-term vs. Long-term market conditions, we would like to emphasize the importance of nearer-term viability. Unless credit prices recover (through aggressive changes to the CI) and market stabilization can be improved (through the AAM process), it will decrease participation, investment, and additional innovations in low carbon solutions, making the long-term conditions moot for most parties that would otherwise participate. The existing credit bank is very robust and CARB will continue to have opportunities to fine tune the implementation to address long-term conditions. PineSpire strongly supports all of the measures to strengthen the program including more aggressive proposed targets and beginning the AAM immediately.

Creating a Phase-Out process in the Rule rather than adjusting Energy Economy ratio

047.2 CARB's proposal to modify the EER of forklifts is not consistent with the definition and purpose of an EER. While the SRIA points to some review of the original analysis, the discussion and methodology in the EER adjustment are not based on the technical parameters of the EER study (see previous comments from PineSpire including on the shortcomings of the explanation provided in the SRIA). It is recommended that rather than adjusting the Energy Economy Ratio, CARB take this opportunity to create a process in the Rule for determining when market saturation of a technology or fuel source has reached a point where it no longer qualifies for full participation in the LCFS program. Applying the reduction to reduce the EER for forklifts, but not to throttle participation by Renewable Diesel, for example, creates a confusing precedent and contributes to market uncertainty as well as undermining the State's push for vehicle electrification.

Phase In of e-Forklift Metering Requirements

047.3 We support the move to metering of forklifts; however, we urge CARB to consider the many complications of developing and deploying devices that can accomplish this and to allow a gradual timeline to transition from estimation method to metering, as Washington and Oregon have done.

e-Forklift Credit Generation issues

047.4 The proposal to shift credit generation from forklift owner to operator would not resolve the issues that currently create complex registrations but could have the opposite effect of increasing confusion and re-registrations. Further work is needed to find a solution that supports accuracy as well as aligning the incentives with the entity making the investment in the hardware.

Thank you for your consideration of our comments.
Sincerely

Ryan Huggins, Partner
PINESPIRE

May 10, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95814

Via electronic submission

Re: Comments on April 10 Low Carbon Fuel Standard Workshop

The Kentucky Soybean Association appreciates the opportunity to provide comments in response to the April 10 Low Carbon Fuel Standard (LCFS) workshop. Kentucky Soybean Association (KSA) is an affiliate of the American Soybean Association (ASA) and welcomes the chance to engage with the California Air Resources Board (CARB) regarding its most recent workshop.

KSA represents Kentucky soybean farmers on domestic and international policy issues important to the soybean industry. U.S. soybean growers have long been committed to producing the world's food, feed, fuel, and thousands of bioproducts in a sustainable and climate-smart way.

As CARB revises and refines provisions in the Initial Statement of Reasons (ISOR) package, KSA is pleased to expand ASA's comments provided during the April 10 workshop. Of highest importance is ensuring that sustainability guardrails are workable for the soybean industry. Additionally, KSA requests that CARB update soybean land use change modeling that uses 20-year-old data and does not reflect current growing practices. Given the recent federal tax guidance released in April on sustainable aviation fuel, there are also additional opportunities to develop LCFS policies that complement work being done at the federal level rather than create duplicative frameworks that create additional burdens on the biofuels value chain.

Positive Workshop Outcomes

KSA appreciates much of the work that CARB staff highlighted in the April 10 workshop. We agree that the robust public process that CARB has championed throughout the LCFS update work has offered significant opportunities for engagement. The workshop highlighted that liquid fuels will continue to be needed in the transportation sector in California for at least the next decade, and KSA believes the role of soy-based biofuels to lower emissions in today's remaining liquid fuel market is vitally important to help mitigate the impacts of climate change. CARB also noted that the Environmental Justice Advisory Committee's proposed agricultural feedstock cap would result in an increase in petroleum diesel usage. We appreciate that analysis done by CARB aligns with ASA conclusions in terms of the negative and perverse impacts of an agricultural feedstock cap.

Looking specifically at soybean oil prices and demand, KSA appreciates that CARB explored soybean oil price volatility in recent years and determined that it was not the result of domestic biofuels policy, but instead the result of several factors, including the war in Ukraine, weather, and other market disruptions. Further, CARB dispelled arguments that use of soybean oil for biofuels was impacting food prices and called this argument a "misleading representation" of the interaction between food and fuel. KSA thanks CARB for their work on this and offers ASA and our state association as resources for additional data related to this in the future.

KSA also appreciates CARB's additional attention on waste feedstock integrity. Imports of these feedstocks, especially used cooking oil, have exploded in the past couple of years due to incentives in California's LCFS. During much of this period, used cooking oil (UCO) was worth more than virgin palm oil. The increase in U.S. imports of UCO occurred after the EU started investigating fraud allegations as much of the trade was rerouted to the North American market. KSA encourages CARB to verify the integrity of imported UCO used in the LCFS.

Sustainability Guardrails: Exploring Additional Options

While CARB had mentioned sustainability guardrails broadly before, this workshop was the first time that staff detailed potential sustainability measures required for agricultural feedstocks. KSA understands that CARB must balance liquid fuel market demands with environmental sustainability goals in California. However, we believe that it is important to work with the biofuels value chain to develop an outcome that is economically and logistically viable for the industry.

048.1

Unfortunately, the information provided in the ISOR and presented in the April 10 workshop offer limited explanation as to why sustainability guardrails are required for agricultural feedstocks. CARB workshop slides state despite increasing domestic virgin oil supplies and uncertainty about increases in virgin oil biofuel consumption in California, "Guardrails [are] still warranted to reduce risks of potential impacts from increased demand of virgin oils in CA LCFS and inform other clean fuels program design." It is not clear what risks remain that must be addressed. Total land use change risk is captured by the LUC score penalty from the GTAP model¹. From an aggregate standpoint, whether biofuels were produced from a U.S. acre in production in 2007 or thereafter is largely irrelevant for carbon intensity. The total change in the system is the important component. Simply shifting eligibility among domestic acreage only adds costs without a program benefit.

048.2

It is also not clear what is meant by informing other clean fuels program design. Many other programs already account for land use change. We also are uncertain what role California plays in the regulatory affairs of other jurisdictions, like Kentucky. The total land use change in the U.S. for crops cannot exceed late 2007 levels under the federal Renewable Fuel Standard. This provision ensures that total crop acreage in the U.S. cannot expand for biofuels. Furthermore, CARB's Global Trade Analysis Project model for biofuels (GTAP-BIO) assumed 812 million gallons of soy-based biofuels are consumed in state whereas California only consumed 378 million gallons in 2023. Last of all, announcements for crush plant expansion in the U.S. total about a 30% increase in domestic capacity. Even if all of these plants were built, that translates to about 15% of the U.S. soybean crop, and the country currently exports 40 to 50% of the soybean crop.

048.3

Without clearly demonstrated objectives, it remains difficult to devise suggestions for a program. Furthermore, other biofuels feedstocks consumed in California are generally not held to the same standard where they must prove they did not engage in a behavior that is already accounted for in the life cycle analysis. This in practice drives up the costs of agricultural feedstocks compared to other feedstocks and fuels, such as petroleum. In other words, it discourages the use of renewable diesel relative to diesel, which is detrimental to overall GHG emissions. If CARB insists that sustainability criteria for agriculture must be met, it should look to programs already developed through farmer input and provide improved scoring for feedstocks that employ sustainability practices to minimize the

048.4

¹ https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/iluc_assessment/iluc_analysis.pdf

changes in comparative costs. Based on the criteria outlined in the workshop and proposed third-party audit scheme, KSA finds the proposal problematic.

Aligning Sustainability Guardrails with Federal Initiatives

The recent tax guidance² for sustainable aviation fuel (40B) released by the Internal Revenue Service and Department of Treasury offers insights as to how CARB could offer improved scoring for feedstocks grown employing CSA. The 40B tax credit uses a new GREET methodology (40BSAF-GREET 2024), which shows soybeans offer a 55% emissions reduction, and can improve an additional 5% using limited CSA. The U.S. Department of Agriculture's Climate Smart Agriculture Pilot Program is currently collecting a myriad of outcomes-based data on agricultural improvements from farmers using CSA. Rather than penalizing agricultural feedstocks through an onerous audit system, CARB should consider providing additional emissions reductions to feedstocks employing CSA.

In January, a new Clean Fuel Production Credit (45Z) will go into effect, which we hope will build on the cover crops and no till practices included in 40B. Conservation tillage, crop rotations, sustainable inputs, precision agriculture, and other practices all help produce a more sustainable soybean. While these options are relevant to most Kentucky soybean farmers, it is not a one size fits all situation. Acknowledging the work being done throughout U.S. soybean fields will ensure that CARB does not restrict sustainable feedstocks from its fuel portfolio.

A Critical Need for Stakeholder Engagement

Any agricultural sustainability criteria that CARB establishes will have significant impacts on how the soy industry and biofuels value chain operates. Hosting one workshop that included sustainability concepts did not provide enough of an opportunity for stakeholder engagement on this topic. KSA supports ASA's request that CARB convene a working group of industry stakeholders before finalizing sustainability criteria to ensure that the logistical limitations and financial impacts that could result from this policy are properly considered.

We encourage CARB to convene a working group that includes agricultural feedstock providers, feedstock processors, and biofuels producers to help develop any sustainability provisions that they would be required to implement. This working group should endeavor to flesh out workable sustainability guardrail provisions that CARB can implement by the second quarter of 2025. This would ensure that CARB develop a solution that does not unintentionally limit sustainable lipid-based feedstocks through onerous reporting requirements, while allowing CARB to continue to focus on implementation of the rest of the LCFS update by the end of 2024.

Updating Modeling for Soy Oil Feedstocks

KSA is also concerned that without a comprehensive update to the GTAP-BIO that CARB utilizes and that relies on 20-year-old data, soy-based feedstocks will be phased out of the LCFS, even though current data indicates a much lower carbon intensity (CI) score. On the one hand, CARB is recommending stringent sustainability guardrails for U.S. soy, but on the other hand is still on track to phase-out soy-based biofuels from credit generation by approximately 2035 or sooner.

² Department of Treasury and Internal Revenue Service. Notice 2024-37.

048.7 cont.

CARB is updating all major models for lifecycle emissions calculations except for GTAP-BIO in this rulemaking. As mentioned above, the soy industry has made vast improvements in sustainability and efficiency over the past two decades, with even greater improvement goals ahead. At the same time, CARB continues to rely on a 2014 model that uses data from 2004. The ILUC score accounts for half or more of the CI score for soy-based biofuels. CARB's current modeling assigns soy biomass-based diesel with an ILUC impact of 29.1g CO₂e/MJ whereas updated results from the model used to calculate ILUC scores indicate a value of between 9 and 10 gCO₂e/MJ for soybeans³. The recently released 40BSAF-GREET 2024 model has an ILUC score of 12.2 for soy-based sustainable aviation fuel in federal programs. The benefits of the LCFS can only be achieved if CI values are accurately captured. If land use change concerns are large enough to justify sustainability guardrails, then the modeling should also be updated to reflect current land use change data. KSA urges CARB to update its GTAP model to align with other modeling changes being made.

Conclusion

KSA is encouraged by the continued successes of programs that support the development of cleaner, low-carbon fuels. California's LCFS has in turn supported rural economies that support the soy value chain. We appreciate the work that CARB has done to update and improve the LCFS. However, it is critical that CARB finalizes updates in a way that does not arbitrarily exclude agricultural feedstocks through onerous sustainability guardrails developed without the input of growers.

KSA is eager to continue working with CARB to support the role of agriculture in diversifying the fuel supply and supporting cleaner fuel options in California and beyond. On behalf of Kentucky soybean farmers, we appreciate the opportunity to comment and look forward to collaborating with CARB and other relevant stakeholders on implementation of policies that expand the use of soy-based biofuels and market opportunities for soybean farmers.

Sincerely,



Adam Hendricks
Kentucky Soybean Association President and Logan County soybean farmer

³ Taheripour, F., Karmai, O., and Sajedinia, E. (2023). *Biodiesel Induced Land Use Changes: An Assessment Using GTAP-BIO 2014 Data Base*. Purdue University

Thank you for the opportunity to provide comments on the California Air Resources Board's (CARB) proposed changes to the Low Carbon Fuel Standard (LCFS). The Ohio Ethanol Producers Association represents the interests of Ohio's biofuel producers and all stakeholders in the ethanol supply chain.

Ohio ethanol producers currently have approved Tier 2 pathways for the LCFS and have a vested interest in ensuring biofuels remains an important element of California's efforts to reduce greenhouse gas (GHG) emissions.

Biofuels has provided the greatest contributions to GHG reductions since the LCFS was first implemented. Bioethanol producers have continued to innovate, lower our carbon footprint, and provide an affordable fuel option for California drivers.

The Ohio Ethanol Producers Association would like to continue to provide consumer-friendly, environmentally beneficial fuel for California drivers. The proposed LCFS changes contain provisions that would have a detrimental impact on bioethanol's ability to contribute to California's GHG reduction efforts.

The proposed sustainability certification for crop-based biofuels raises several serious concerns:

049.1 While the proposed certification would impose additional requirements on biofuel producers and farmers, it fails to acknowledge on-farm climate-smart practices in calculating the carbon intensity (CI) score.

049.2 Concerns regarding land use change relative to corn starch ethanol are unjustified. The acreage dedicated to corn cultivation has remained relatively constant over several decades, mirroring figures from the 1930s. The national increase in corn production stems solely from improved yields. Even if land use change were a concern, it is adequately addressed by the existing 19.8-point penalty.

049.3 Certain aspects outlined in the audit are irrelevant to a carbon-reduction initiative. Factors such as farm labor practices or profitability have no impact on the CI score.

Furthermore, these new audit provisions unrelated to CI would exclusively apply to crop-based feedstocks, exempting other fuel sources from similar scrutiny.

049.4 We encourage CARB to delay any sustainability certification requirements for bioethanol in the 2024 rulemaking. If the requirements are finalized, it could inadvertently result in less bioethanol used in the state and increased GHG emissions.

049.5 Additionally, we ask that CARB continue the process of approving E15 for sale and use in California. With E15 approval, GHG reductions from bioethanol use will be even greater, as bioethanol has as much as a 46% reduction in GHG compared to gasoline.

We thank you for the opportunity to provide comments and are happy to answer any questions Board member or CARB staff may have

Sincerely,

Submitted electronically at:

<https://ww2.arb.ca.gov/lispub/comm/bclist.php>

<https://ww2.arb.ca.gov/public-comments/low-carbon-fuel-standard-workshop-april-10-2024>
May 9, 2024

Clerks' Office
California Air Resources Board
1001 I Street
Sacramento, California 95814

Re: Opposition to California Air Resources Board Proposal to Regulate Jet Fuel

Dear Chair Randolph,

In response to the workshop held April 10, 2024, we are writing to restate our opposition to the recent California Air Resources Board (CARB) proposal to regulate jet fuel under its Low Carb Fuel Standard (LCFS) Program. We believe the CARB proposal will raise the cost of jet fuel without creating additional Sustainable Aviation Fuels (SAF) production or use in California, an objective the aviation industry shares with CARB. Further, the proposal to regulate jet fuel is pre-empted by federal authority. We encourage CARB to withdraw the proposal to regulate jet fuel and instead establish a joint CARB-industry working group to explore alternative solutions to increase SAF production and use.

As California's largest intrastate jet fuel consumer, Southwest Airlines is committed to reducing its climate impact and achieving net zero carbon emissions by 2050, and transitioning to SAF is core to this commitment. We have long recognized that scaling up the supply of SAF and achieving net-zero carbon emissions by 2050 can only happen by working collaboratively with governments and other stakeholders across sectors. Achieving this ambition for SAF will require new and additional policy incentives, streamlined permitting processes, and close collaboration among governments, the aviation industry, the fuels industry, environmental organizations and others.

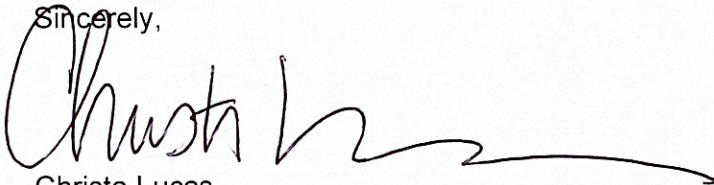
Aviation accounts for 2.6% of the U.S. greenhouse gas emissions but 5% of U.S. Gross Domestic Product (GDP) and 4.1% of California's GDP, thus exerting outsized economic impact relative to its share of emissions. The United States civil aviation industry employs more than 380,000 California-based employees, with an overall economic impact of \$194 billion.¹ Aviation is critical to driving California's economy and its rank as the 5th largest economy in the world, enabling \$114 billion in annual trade flows and underpinning many of California's other significant economic drivers such as agriculture, tourism, manufacturing, banking, technology and small business.

California has established itself as an early leader in attracting investment, production and use of SAF through the existing LCFS Program, which provides an opt-in credit for SAF that helps reduce the price difference between SAF and conventional jet fuel. Ensuring a healthy and vibrant aviation industry is essential to California's future, and leveraging CARB's early leadership on SAF can enable California leadership in the emerging SAF production industry, creating new jobs and economic development opportunities.

¹ [The Economic Impact of Civil Aviation on the U.S. Economy, State Supplement, US Department of Transportation, November 2020](#)

Our mutual interest is to increase SAF production, availability and use, and the most effective way to accomplish this is to continue the positive, collaborative approach represented by the existing "opt-in" mechanism developed by CARB and the aviation community. Only actual SAF use – not merely the creation of jet fuel deficits – will provide the benefits of SAF desired by CARB, airport communities, SAF producers, and airlines. We urge CARB to reconsider and withdraw the proposal to remove the exemption for jet fuel for intrastate flights, preserve the existing opt-in approach for SAF, and establish a joint CARB-industry working group with stakeholders across the emerging SAF ecosystem to explore alternative policy and voluntary proposals to rapidly increase SAF production, availability and use in California. We look forward to working with CARB on such measures to accelerate SAF deployment.

Sincerely,

A handwritten signature in black ink, appearing to read "Christa Lucas", followed by a long horizontal flourish.

Christa Lucas
Vice President, Governmental Affairs
Southwest Airlines



**COMMENTS OF HIF USA
ON
CALIFORNIA AIR RESOURCES BOARD
PROPOSED LOW CARBON FUEL STANDARD AMENDMENTS**

MAY 9, 2024

Highly Innovative Fuels USA (HIF USA) appreciates the opportunity to offer these comments in response to the workshop that the California Air Resources Board (CARB or the Board) held on April 10, 2024 regarding proposed amendments to the Low Carbon Fuel Standard (LCFS) regulation.

A subsidiary of HIF Global, HIF USA is a global eFuels company focused on harnessing renewable energy sources to achieve fuel sector decarbonization. HIF USA is currently developing a large-scale commercially viable facility for generating low-carbon eFuels that can be used in a number of transportation applications and has submitted an LCFS pathway for its process that is currently awaiting CARB approval. HIF USA's focus on eFuel development fully aligns with CARB's mission in the LCFS program to encourage private sector innovation to develop a diverse supply of low-carbon transportation fuels in California. This is why HIF USA has been an active participant in support of CARB's LCFS update process, submitting comments on the regulatory amendment package that CARB released on December 19, 2023 and participating in the September 28, 2023 hearing and April 10, 2024 workshop.

I. LCFS Incentives for Low CI Methanol

HIF USA's representative, Shannon Broome, explained at the September 2023 Board hearing and April 2024 workshop that an important way for CARB to incentivize the proliferation of carbon-neutral transportation fuels in California is to amend the LCFS regulations (specifically Section 95482) to ensure that low-carbon intensity (CI) methanol (also referred to as "green methanol") is eligible for LCFS crediting as an opt-in fuel when sold for use in marine and other specialty transportation applications such as direct methanol fuel cells. HIF USA writes to reiterate this request as CARB considers how to craft a final rule that will create optimal incentives for a variety of low-carbon transportation fuels in California.

As explained in Ms. Broome's testimony at the September 2023 Board hearing and April 2024 workshop, as well as in the written submittal to this docket by Greg Dolan of the Methanol Institute, amending the LCFS regulations to identify green methanol as an opt-in fuel would create an important incentive for low-CI fuels in hard-to-decarbonize sectors such as marine transportation. Currently the LCFS regulations do not identify green methanol as an opt-in fuel, meaning that there is no opportunity for low-CI methanol created via HIF USA's process to generate LCFS credits. CARB could amend the LCFS regulations to incentivize the production and sale of this fuel in California by specifying that opt-in entities can obtain LCFS credits for low-CI methanol volumes sold for use in marine applications.

In a presentation during an LCFS workshop held in July 2022, CARB staff indicated that it was considering the inclusion of methanol as an opt-in fuel for "novel applications," including "commercial harbor craft" under Tier 2 EER-adjusted pathways. Yet, its proposed regulatory

amendments released in December 2023 did not include this proposed change, nor did CARB staff address the possibility of including this change in its presentation during the April 2024 workshop.

051.1 cont.

Ms. Broome asked staff during the April 2024 workshop about why CARB did not move forward with proposing to include green methanol as an opt-in fuel as was under consideration at the July 2022 workshop, and the response was that CARB did not feel that it had enough data on this fuel to support a proposal. CARB also raised the concern that, because methanol was not included as an opt-in fuel in the proposed rule package put out for a 45-day comment period in December 2023, it could not be included in the final amendments. HIF USA addresses these two issues as follows:

051.2

1. HIF USA is more than happy to support CARB in obtaining whatever data it may feel is necessary, either as part of this rulemaking proceeding or in the context of its currently-pending LCFS pathway application. In its April 11, 2024 submittal to this docket, the Methanol Institute also indicated its willingness to engage with CARB staff to facilitate access to all necessary data on green methanol.¹ Indeed, as we have previously commented, we would very much welcome the opportunity to engage with staff on this issue.
2. CARB could accomplish the requested change without initiating a new 45-day comment period. Members of the public were put on notice that CARB was considering including methanol as an opt-in fuel for certain applications back in July 2022 when CARB staff originally presented the concept during its “Public Workshop to Discuss Potential Changes to the Low Carbon Fuel Standard.”¹ HIF USA has commented multiple times in public forums on this change and has noted the benefits of such a change in its written submittals to CARB’s public comment dockets, including in testimony at the September 28, 2023 Board hearing on the LCFS amendments—which occurred well before the proposed rule package was released for 45-day comment.² Thus, the change would be sufficiently related to the regulatory language included in the 45-day package (within the meaning of Cal. Gov. Code § 11346.8(c)) such that CARB would only be required to issue 15-day notice of the change.³ Given the multiple times that the potential change was raised in these proceedings, a reasonable member of the directly affected public has certainly been on notice that such a change was possible.⁴

¹ See CARB, “Public Workshop to Discuss Potential Changes to the Low Carbon Fuel Standard,” “CARB Presentation” at Slide 31 (July 7, 2022), available [here](#).

² See, e.g., Comment 17 for Public Meeting to Hear an Update on the Low Carbon Fuel Standard (Sept. 28, 2023), available [here](#) (HIF USA pre-proposal comments to CARB Board requesting inclusion of low-CI methanol as an opt-in fuel in the LCFS regulations).

³ Cal. Gov. Code § 11346.8(c).

⁴ See 1 CCR § 42 (defining “sufficiently related” changes). See also *Western Oil & Gas Ass’n v. Air Resources Bd.* (1984) 37 Cal. 3d 502, 526 (“[T]he regulation adopted need not be the same as that proposed as long as it deals with the same subject or issue dealt with by the notice.”).

II. Book and Claim Accounting for Low-CI Electricity Used for Production of Hydrogen as E-Fuels Feedstock

051.3 HIF USA shares the concerns of the commenters who spoke at the April 10 workshop⁵ regarding CARB’s proposed regulatory text in 17 C.C.R. § 95488.8(i)(1)(A) which—as proposed in the 45-day package released in December 2023—would restrict the ability of eFuels proponents to use book-and-claim accounting (and specifically, Renewable Energy Certificates (RECs)) to claim the emission benefits of low-CI electricity used to produce hydrogen through electrolysis in the production of eFuels. HIF USA agrees with commenters at the April 10 workshop that CARB should not finalize this regulatory provision as proposed, as it would negatively impact the commercial availability of low-CI eFuels in the California transportation fuel market. HIF seeks to promote the use of eFuels in hard-to-decarbonize sectors where there is significant opportunity to reduce lifecycle emissions, as well as to reduce emissions of conventional pollutants that have impacts in environmental justice communities that are near ports in California.

We appreciate CARB’s willingness, as indicated at the April 10 workshop, to reconsider this issue. To facilitate reconsideration, HIF USA refers to and incorporates by reference its previous submittal to CARB addressing the proposed changes to 17 C.C.R. § 95488.8(i)(1)(A).⁶ As explained in that submittal, we encourage CARB to clarify the language of 17 C.C.R. § 95488.8(i)(1)(A) to ensure the continued use of book-and-claim accounting for low-CI electricity used for hydrogen production through electrolysis as a process step for eFuels. Proposed regulatory text to make this clarification was included in HIF USA’s comments on the 45-day package.

#

We look forward to working with CARB staff on the LCFS regulatory provisions discussed above and on processing our LCFS pathway application to facilitate bringing innovative fuels to California, including green methanol.

If you have any questions or would like to discuss this submittal, please contact Shannon S. Broome, Hunton Andrews Kurth LLP (sbroome@huntonak.com) or (415) 818-2275.

⁵ CARB, Workshop Recording, Low Carbon Fuel Standard Public Workshop - April 10, 2024, available [here](#) at 3:40 (comments of Infinium and Rocky Mountain Institute advocating for use of book-and-claim accounting for low-CI electricity used to produce hydrogen as feedstock for eFuels).

⁶ See Comment 389 for Proposed Low Carbon Fuel Standard Amendments (Feb. 20, 2024) at 2, available [here](#) (HIF USA comments in response to CARB 45-day proposal regarding CARB’s proposed regulatory text for 17 C.C.R. § 95488.8(i)(1)(A)).

May 9, 2024

Liane M. Randolph, Chair
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Comments on the April 10, 2024 LCFS Workshop

Dear Chair Randolph:

052.1

CARB staff continue to suppress the issues that have been raised by the undersigned organizations, the Environmental Justice Advisory Committee, environmental justice organizations, and several Board members. The workshop did not include those issues which we have consistently raised throughout the rulemaking process, including (1) ending avoided methane crediting; (2) adopting Senate Bill 1383 regulations; and (3) protecting the civil rights of San Joaquin Valley and refinery communities.

Defensores del Valle Central para el Agua y el Aire Limpio (“Defensores”) and the other signatories to this letter have amplified concerns regarding the proliferation of factory farm gas and its harmful effects on communities’ health. We have tried to ensure that CARB addresses those concerns throughout – and even prior to – this rulemaking. Unfortunately, CARB staff have consistently chosen to ignore those concerns while blatantly erasing communities’ lived experiences and the impacts communities suffer every day. Accordingly, when Defensores’ members learned that CARB staff excluded their concerns from the workshop agenda, Defensores decided to boycott the workshop.

Defensores’ decision was a wise call. CARB staff leading the meeting attempted to dismiss and discredit comments from environmental justice and public interest stakeholders. Additionally, CARB staff gave priority to in-person participation despite the meeting notice advertising the ability to make comments in person or virtually. In fact, CARB staff ended the Workshop at 4 p.m. even though many remote participants had not had an opportunity to comment, including Food & Water Watch. There was no interpretation available for in-person or remote participants. Had Defensores members participated, had they even been able to participate given the decision to cut off public comments and lack of interpreters, it seems that they would have been reminded by CARB staff, as the other signatories to this letter were, that the LCFS rulemaking would continue to ignore their experience and expertise.

We urge you to watch the entire video of the workshop with a civil rights lens and ask yourself, “if I was participating in this workshop as a member of the public concerned about the impacts of the rule changes, would I feel heard or dismissed?” Any neutral observer of the April 10 workshop would have reached the same conclusion that we communicate to you today: CARB staff is not considering the concerns of all Californians, including those who live, breathe, and drink near large scale livestock operations or refineries. We call on you and the rest of the Board to reset this rulemaking with a civil rights lens, set an even playing field for environmental

justice issues, and ensure that CARB staff respect and understand communities' lived experiences.

Rather than repeat the issues we have consistently raised for several years, which have been ignored by CARB staff, we direct you to our comments in the docket on both the [ISOR](#) and the [environmental analysis](#), as well as [comments from Defensores](#).

Thank you for your commitment to environmental justice.

Sincerely,

Jamie Katz
Phoebe Seaton
Michael Claiborne
Leadership Counsel for Justice & Accountability

Defensores del Valle Central para el Agua y el Aire Limpio

Brent Newell
Law Offices of Brent J. Newell

Tyler Lobdell
Food & Water Watch

Christine Ball-Blakely
Animal Legal Defense Fund

GENERAL MOTORS

May 10, 2024

Clerks' Office

California Air Resources Board

1001 I Street

Sacramento, CA 95814

(Submitted electronically via <https://ww2.arb.ca.gov/applications/public-comments>)

RE: Low Carbon Fuel Standard: 2024 Proposed Amendments

General Motors LLC (GM) appreciates the opportunity to offer comments on CARB's Low Carbon Fuel Standard (LCFS) Proposed Amendments for 2024.

If you have any questions, please contact me at +1-202-775-5071.

Sincerely,

A handwritten signature in blue ink, appearing to read "David Strickland", with a horizontal line drawn above the name.

Hon. David Strickland

Vice President

Global Regulatory Affairs and

Transportation Technology Policy

General Motors LLC

GENERAL MOTORS

EXECUTIVE SUMMARY

General Motors LLC (“GM”), headquartered in Detroit, MI, is a global automotive manufacturer committed to positively impacting the communities where its customers live and work. As of January 2024, GM employs roughly 163,000 employees, operates 155 facilities, delivers over 2 million vehicles annually, and works with more than 10,000 suppliers.¹

GM is focused on advancing toward a zero emissions future that is inclusive and accessible to all.² Battery Electric Vehicles (“BEVs”) are key enablers of our vision for a world with Zero Crashes, Zero Emissions, and Zero Congestion.³ GM regularly reports on sustainability metrics,⁴ and endeavors to track and report emissions inventory.⁵ GM has set science-based targets consistent with the goals of the Paris Agreement to support this vision.⁶

GM appreciates the opportunity to provide its insight as a BEV manufacturer to CARB’s April 10, 2024 Workshop on proposed updates to the Low Carbon Fuel Standard, particularly on aspects of the proposal related to EV charging. This proposal clearly signals CARB’s intention to further pursue reductions in carbon-based fuel impacts to the environment by incentivizing BEV deployment lower carbon intensity electricity. GM supports CARB’s proposed updates to the LCFS framework, with recommendations on specific aspects of the revised program.

GM supports CARB’s framework proposal to tighten carbon intensity stringency, adopt an acceleration mechanism and introduce a step down in stringency for 2025.

053.1

CARB’s LCFS program is among the most successful regulatory programs, delivering significant reductions in carbon intensity from fossil fuels and promoting adoption of lower carbon intensive transportation modes. As such, the market is oversupplied with credits, thereby reducing their value and potential to reinvest in California’s EV infrastructure development. CARB’s plan to increase stringency for the LCFS market will tighten market conditions, bolstering the market and further decreasing carbon intensity in liquid fuels.

The proposed amendment to require a 30% reduction in carbon intensity benchmarks by 2030 is appropriate for market conditions. Adding additional flexibility to the regulation with the adoption of a near-term step-down and an automatic acceleration mechanism will strengthen the LCFS program long-term. Using two credit market ratio signals as the triggers for the acceleration mechanism is appropriate to address the specific problem that the proposal is intended to address.

Credits generated from light-duty electric vehicles should be reinvested into the still developing light-duty electric vehicle market.

053.2

While California leads the US in EV sales having reached 25% market share, the EV transition is far from complete. Substantial progress is needed to meet CARB’s complementary regulatory

¹ <https://www.gm.com/company/usa-operations>

² <https://news.gm.com/company/about-us>

³ *Id.*

⁴ <https://www.gmsustainability.com/esg-resources-and-downloads.html>

⁵ <https://www.gmsustainability.com/data-center.html>

⁶ https://www.gmsustainability.com/_pdf/resources-and-downloads/GM_2021_SR.pdf (pages 11, 16-17)

GENERAL MOTORS

programs, which will require 51% ZEV sales in 2028 leading to 100% by 2035 under Advanced Clean Cars II. The transitioning EV market is entering difficult terrain as the market transitions from early adopters to mainstream buyers. Mainstream buyer characteristics indicate that incentives and infrastructure access are more important than ever. Infrastructure access for light-duty vehicles must be addressed to achieve EV market growth to meet regulatory and climate expectations. Funding generated from residential EV credit generation should be directed to the light-duty EV market by investing in infrastructure deployment, vehicle incentives and public education.

GM recommends that CARB reinstate Clean Fuel Rewards for light-duty EV adopters. Light-duty EV adopters represent the best opportunity for reducing carbon intensive transportation applications, including the harder to transition used vehicle market. Residential light-duty EV charging funds the Clean Fuel Reward program and this program is highly incentivizing to light-duty EV purchasers as it is available at the time of purchase as an “on the hood” incentive. It is paramount that the Clean Fuel Reward program is reliably mechanized for light-duty vehicle purchasers. We urge CARB to reconsider its proposal to allocate the Clean Fuel Reward to medium and heavy-duty electric vehicles and instead reserve these light-duty credits for reinvestment in light-duty EV purchasers.

GM looks forward to reviewing details on CARB’s proposal to add third-party verification provisions to electricity transaction types.

GM recognizes and supports provisions designed to enhance integrity of regulatory programs, while streamlining regulatory compliance and costs. Based on CARB’s proposed regulatory text, CARB’s expectation for how third-party verification should be managed for metered residential EV charging are unclear.

In §95500(c)(1) Applicability, entities submitting Quarterly Fuel Transaction Reports are expected to obtain the services of an accredited verification body, including required site visits. It would be ideal to understand CARB’s expectations for a “site” under this verification requirement, as this definition could be widely interpreted as it pertains to residential EV credit generation and may require considerations to address consumer privacy protections. Finally, third-party verifiers for regulatory programs tend to slow market conditions due to limited accreditors, at least in the near term. We look forward to working with CARB to come to a practical solution for both parties to demonstrate validity of EV residential charging events for the final amendment update.

CONCLUSION

GM supports CARB’s proposed framework for the 2024 Low Carbon Fuel Standard updates. As one of the key stakeholders in low carbon electricity usages within the LCFS program and its administration, GM would be glad to provide further support for any of the above topics and looks forward to continued collaboration on the development of the LCFS program.



May 9, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: FuSE Comments on April 10th CARB LCFS Workshop

Energy Mission Control, Inc. dba FuSE Carbon Technologies (FuSE) appreciates the opportunity to comment on the recent LCFS workshop held by CARB on April 10th. FuSE is a Sacramento-based technology company that helps facilitate participation in the LCFS, as well as in Oregon's Clean Fuels Program, Washington's Clean Fuel Standard, British Columbia's Low Carbon Fuel Standard, and the Canadian Clean Fuels Regulation for many hundreds of small, medium, and enterprise level businesses operating tens of thousands of electric vehicles and equipment in every qualified electricity reporting category. Building upon decades of clean-transportation industry and public funding experience, FuSE has developed a comprehensive and streamlined software platform that eliminates many of the administrative roadblocks that traditionally preclude small fleets from opting into clean fuel programs and allows them to take clear, affirmative, and immediate steps to reinvest in electrification efforts of their business operations.

We offer support, additional background on typical industry practice, information on the current state of affairs on electric off-road vehicle and equipment fleet participation, and a series of suggested alternatives or improvements on the current regulation language and amendment proposals:

054.1

FuSE strongly supports the concept of the AAM, however, believes single-year or intra-year adjustments are technologically feasible and digestible to the market. As currently proposed, and as the market has clearly identified via trading trends, the proposed updates to CI targets and infrequency of AAM triggering is not stringent enough.

054.2

FuSE supports the amended text reflecting the transition of E_{x0} Displaced calculated values not applying to forklifts, and similarly should be expanded to fixed guideways. Original intent and discussion of a model year threshold in both applications was tied to the implementation date of the LCFS program¹, the equipment's already deployed status, and not to the physical difference in equipment efficiencies across those model year threshold dates. The elimination of any model year association with technology deployments, especially as the LCFS program ages, makes less and less sense with newer technologies being deployed and streamlines the administrative work with submitting and reviewing applications greatly. There is no meaningful purpose for pre-2011 or post-2010 designations in these categories, or any others moving forward should new transportation equipment types be introduced in the future.

¹ https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/lcfs_meetings/12022016discussionpaper_electricity.pdf

e-Mission Control strongly opposes the EER reduction for forklifts under 12,000lb lift capacity, for three important reasons:

054.3

- 1) This will **heavily undermine the success of the Zero-Emission Forklift Rule**, which uses the LCFS program funds, as currently calculated, to show a beneficial ROI. Reducing the EER by half increases the ROI by 50% or more, directly impacting small and medium-sized businesses that will be required to purchase new lifts and equipment to comply.
- 2) **The EER is not the place to account for market penetration effects of the LCFS program.** The purpose of the EER, the *Energy Economy Ratio*, is to define how much more energy efficient an alternative-fueled vehicle or equipment is relative to an internal combustion baseline. Making miscellaneous adjustments to the EER value implies that the same may happen to other vehicle or equipment categories as market penetration is increased, even if that is not the agency's current intent. **There already exists high market penetration of renewable diesel, electrified eOGVs/shore-power for container operations, and several other LCFS-qualified equipment segments. Cavalier EER adjustments set a bad precedent for future rulemaking, both in and outside of California.** If market penetration is a concern of LCFS staff, then a credit calculation variable should be introduced. Please be aware that **implementation of metering in the eMHE category will already reduce eMHE credit generation by 90%+ (most fleets will not see an ROI on submetering and Book-and-Claim ROI is not likely in the near term, meaning the reduced EER is impactful in the credit calculation equation twice).**
- 3) **Any tactic taken to reduce credit generation should only come from adjusting the compliance curve.** CARB has an unprecedented opportunity to move more and more capital from regulated entities to fleet electrification, with relatively very little argument from such regulated entities, and we believe any rollback of opportunity is simply a delaying of the overall GHG reduction opportunity in the transportation sector.

As has long been established, the LCFS is meant to incentivize the adoption and use of low-, zero-, and negative-carbon fuels, and any policy within the program that facilitates this goal should be supported. FuSE currently represents many hundreds of small and medium-sized fleets, all of whom are operating some mix of equipment and vehicle types. For example, a small company may operate a few forklifts and a number of light-duty cars as part of their general operation. Simultaneously, a large company may operate hundreds of forklifts, thousands of refrigeration units, dozens of light and heavy-duty vehicles, several off-road pieces of equipment (i.e. yard trucks or rail car movers), and a host of other transportation technologies. In our experience, **none** are entirely zero-emission across their operation. **The LCFS program should holistically support fleets of all types, mixes, and sizes, and, as there is no prohibition on spending funds generated from one technology (i.e. forklifts) on another (i.e. converting TRU's to hybrid eTRU's), CARB should continue incentivizing zero-emission technologies until entire fleets, not specific technologies, are entirely zero-emission.**

054.3 cont.

054.3 cont.

Additionally, considering specific technologies for a reduced EER value simply based on the commercialization readiness or market penetration becomes an extremely slippery slope. In addition to forklifts, total cost of ownership analysis for light-duty vehicles², shore power³, hybrid eTRUs⁴, natural gas Class 8 trucks, and soon, heavy-duty vehicles⁵, all regularly show a net benefit, even without incentive from the LCFS, and many will reach a significant market penetration well within the time bounds of the LCFS. The shore-power market penetration of container vessels subject to the At-Berth Regulation is over 90%, but eOGV is still an eligible category in the LCFS, as it should remain, so ports and port tenants can continue reinvesting in other technologies and other shore power verticals needing upgrades. This trend will continue as manufacturing becomes more effective, supplies become more readily available, and efficiencies and storage capacities increase substantially over the next five to ten years. We believe that the argument for reduced credit generation potential, if based on the concept of additionality (whereby a key decision maker would have made the decision to electrify a certain piece of equipment anyway, even without the LCFS), should be **fleet-focused**, and not equipment-focused. As mentioned above, being equipment-focused is a short-sighted perspective considering the volume and mix of equipment at any one company, and is entirely juxtaposed with the intention of the LCFS. For example, the question should not be, “Will a fleet operator purchase a forklift even without the LCFS value?” but instead should be, “Without the funds that an electric forklift would generate from the LCFS, would that fleet operator have upgraded vehicles or equipment on site that does not have a beneficial TCO?” If “No” is the response to the second question, then no equipment, regardless of commercialization, TCO, or market penetration should be excluded from the LCFS.

Also, while it is not in CARB’s jurisdiction to consider other states or geographies developing clean fuel programs/standards, CARB should note that much of California’s LCFS regulatory language is often heavily utilized in the deployment of other programs (i.e WA and OR both use much of the FSE definition, EER table values, and much more). In the same way that the localized emission reductions from out-of-state renewable fuels imported into the state are seen outside of California, CARB should consider the implications of regulatory change influencing other agencies considering the adoption or amendment of similar programs. Excluding technologies now will set a bad precedent, intentional or otherwise, for states that need to lean on the CARB LCFS regulatory language for success, and worse, heavily influence greenhouse gas emission reduction in areas that do not have wide adoption of electrified vehicles and equipment.

054.4

Metering requirements for forklifts need to be phased in. There is widespread agreement that metering for forklifts is a preferred method of reporting for credit generation, as it more closely aligns with other

² https://ww2.arb.ca.gov/sites/default/files/2020-06/190225tco_ADA.pdf

³ https://theicct.org/sites/default/files/publications/ICCT-WCtr_ShorePower_201512a.pdf

⁴ <https://www.safeconnectsystems.com/the-ultimate-user-guide-to-etru/six-steps-to-convert-to-etru/> & <https://www.mass.gov/doc/etru-grant-brochure/download>

⁵ https://ww2.arb.ca.gov/sites/default/files/2020-06/190225tco_ADA.pdf



reporting categories, is more accurate, and would eliminate an administrative burden related to registering and tracking equipment locations. However, as is also widely agreed, **the electric forklift technology evolution status is still very rudimentary**, with almost all deployed charging systems not having any integrated metering. To date, telematic deployments are still largely cost-prohibitive on a per-unit/battery level to be installed just for purposes of LCFS participation, have difficulty with data access and transfer within confined warehouse operations, and may not be appropriate across mixed

054.4 cont. OEM fleets. As “smarter” technologies are made more available by OEM’s to give energy consumption insight to fleet operators, **we believe a phase-in schedule similar to the ZE Forklift Rule is appropriate to accommodate for naturally-occurring turnover to new systems.**

At only a 50% market adoption of electric forklifts, there is still a significant amount of equipment that needs to be transitioned to a zero-emission fuel source, especially considering that the overall electric market share has not changed in recent years. As mentioned in the paragraphs above, many of the companies we represent have mixed fleets and rely on the funds from their LCFS participation to expedite the continued conversion of their forklifts and to work towards full conversion of their on- and off-road fleets. **FuSE supports the continued use of the Calculated Methodology used for forklift energy consumption, though technical revisions could be considered to ensure data accuracy and integrity.**

054.6 **Regarding Third-Party Verification for the electricity provisions, FuSE supports extra visibility into data submissions as long as it avoids generating prohibitive burdens for small generators.** According to FSE-level registration data, aggregation service providers represent approximately 94% of electricity-provision-related FSEs participating in the LCFS, which we suspect is due largely to the burden of reporting and transaction activities. Specifically, **the verification process should not be so burdensome as to prevent small generators from participating in the program, with or without an aggregator.** FuSE encourages the ARB to further clarify the process of EV charging verification. In regards to site visits, **program participants would benefit from understanding what information other than meter data would need to be verified.** If the addition of verification increases participation costs, small fleets and/or aggregators may be prevented from helping small groups participate in the LCFS program. If verification is expanded to include EV Charging transaction types (eTRU, eCHE, and eOGV Fueling, etc), FuSE would support an exemption for aggregators representing small volume generators, as there is no meaningful mechanical difference between an exempted small generator participating independently and a designator representing such a generator. The designator is simply facilitating the administration of the program and is likely to reduce the chance of reporting error.

054.7 **FuSE supports the inclusion of other equipment types, though we suggest CARB establish EER values for GSE and agriculture equipment.** During the July 7 workshop, CARB mentioned that staff is considering the inclusion or addition of zero-emission applications for rail, agricultural equipment, commercial harbor craft and airport GSE under the Tier 2 EER-adjusted CI pathway application process. We highlight that these application opportunities are already present under the current regulation and any pathway applicant may submit an EER-adjusted Tier 2 pathway application. Using other studies, such



as the CAC's EER RFP⁶, CARB should consider the additions of these equipment types to Table 5, significantly improving the likelihood of LCFS participation of these new technologies and would route badly needed funding toward fleets considering deployment.

As proposed, modifications to the eMHE and eTRU credit ownership will NOT correct existing administrative issues. Staff's intent is to award credit ownership to the fleet operator⁷, however, as proposed, the credit ownership is awarded to the "FSE owner," with FSE defined as the "facility or location" and if, "there are multiple FSEs capable of measuring the electricity dispensed at the facility or location, then it is optional to provide serial number assigned to each equipment by the OEM and the name of OEM." This implies that if there are meters installed on site (which is regularly required in eMHE, eTRU, eOGV, and eCHE categories), then the meter owner becomes the credit generator. It is extremely common in leasing and renting arrangements that the charger ownership (and thereby the individualized meter, if available) be withheld by the lessor, and thereby the opportunity to assert ownership of credit generation remains, and worse, that double-counting occurs due to the lack of incentive of the meter owner to notify the FSE operator that credit generation is occurring. The electricity categories are fundamentally different from the liquid and gaseous fuel categories, and FuSE strongly suggests that CARB clarify that the FSE operator be the eligible credit generator in all electrification categories.

"Private MHD-FCI charging site" is defined in the amendments, but no subsequent regulatory language is proposed. The ISOR is clear that there is intent of supporting private MHD infrastructure, but no language is proposed. FuSE supports clarifying language identifying the opportunity for Private MHD-FCI crediting.

FuSE thanks CARB for the opportunity to comment and participate in the amendment process and looks forward to working with the LCFS team on future improvements that facilitate the transition of California's transportation fuel pool toward a more sustainable and decarbonized future.

Sincerely,

Energy Mission Control, Inc. dba FuSE Carbon Technologies

CC: Todd Trauman, CEO
Colby Green, Director of Business Development
Elaine O'Byrne, Director of Operations

⁶ <https://www.oregon.gov/deq/rulemaking/Documents/CFP2022EWcacStudy.pdf>

⁷ https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/lcfs_appe.pdf



May 9th, 2024
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Low Carbon Fuel Standard Public Workshop, April 10th

Dear CARB staff,

We appreciate the opportunity to provide comment on the April 10th Low Carbon Fuel Standard Public Workshop, part of the greater process in moving forward with updates to this critical program. California Environmental Voters champions climate justice and therefore the potential that an improved LCFS will have to advance environmental and community outcomes. This program is critical to achieving California's climate goals, but it must continue forward with changes that reflect the lessons learned to maximize the program's outcomes.

Inclusion of additional fuel sectors

055.1

We commend CARB staff for recognizing the importance of folding in jet fuel into the LCFS. As California is the largest consumer of jet fuel in the country, it's crucial to expand our decarbonization efforts to this sector of transportation. Intrastate flights are the logical starting point, however as noted in the ISOR this only includes 10% of flights which account for 2% of the state's overall transportation sector emissions. We urge CARB to move forward with this, however CARB should consider the greater emissions benefits of interstate and international flights where possible.

055.2

Similarly, crediting zero-emission shipping fuels and simplifying crediting for shore power installations for electric harbor crafts are both necessary actions to reduce port emissions. This action would be on par with commitments from major cargo owners and shipping to transition to zero-carbon shipping fuels by 2040¹. Any hydrogen used in this sector can and should be truly green hydrogen. Green hydrogen should only be considered electrolytic hydrogen produced using truly clean sources of energy (wind, solar, geothermal) and the production must adhere to the three pillars of 1) additionality, 2) hourly matching, and 3) deliverability in order to not risk increasing emissions. Updating crediting for these would provide the financial incentives to usher in this transition in a timely manner, in addition to reducing the emissions burden faced by port communities.

055.3

ZE Solutions

055.4

The longevity of liquid fuels for legacy vehicles is expected as we transition toward electric vehicles, however the LCFS program is allocating an outsized share of financial incentives to these fuels. In 2022 80% of the funding in the LCFS program went to combustion fuels instead of electricity, which is arguably more pertinent to the state's near- and long-term expectations

¹ "Leading Cargo Owners Stand Together for Maritime Decarbonization." Cargo Owners for Zero Emission Vessels (2021). https://www.cozev.org/img/FINAL-coZEV-2040-Ambition-Statement_2021-10-18-144834_uorz.pdf

for ZEV deployment across the state². Furthermore, the state would see significant benefits if CARB were to increase support for electric school buses and transit buses. Reducing the VMT and emissions are both critical to reaching our climate goals set forth in the 2022 Scoping Plan, so bolstering these types of vehicles should be prioritized.

Polluting fuels

Biofuel cap

Fossil diesel has a known and harmful legacy of emissions that the LCFS seeks to slow, however biofuels are not without their own direct and indirect detrimental impacts. The workshop acknowledges the necessity of guardrails in ongoing biodiesel usage. At minimum, accurate CI scores and the addition of land-use change (LUC) impacts are necessary to factor in the overall impacts of these fuels within the LCFS. Moreover, when EPA compared five models for assessing the climate impacts of crop-based biofuels, only CARB's yielded a positive carbon-reduction impact, which raises the question of how the benefits of such fuels are overstated in the current LCFS³. Given the unprecedented growth these fuels have seen due to this program, a cap would limit associated environmental harms, stabilize credit prices, and prioritize funds going toward ZEV deployment⁴.

Avoided methane crediting phase out

CARB staff's current proposal suggests a 2040 phase-out date for avoided methane crediting, this delayed date a product of the timeline of transitioning to non-combustion vehicles as shared in the 2022 Scoping Plan Update. While we understand the longevity of demand for fuels such as biomethane as certain sectors are slower or more difficult to decarbonize, we urge staff to reconsider the precedent this credit has established.

Dairies account for over half of methane emissions in California yet the only incentive to capture emissions is avoided methane crediting. This model created a perverse incentive where increased herd sizes allow digester operators to capitalize off captured emissions. The livestock waste management associated with digester operation is not the lowest-emissions pathway, given the option for dry handling, however it is perpetuated due to the appeal of maximizing credit generation.

As of January 1, 2024, the regulation of dairy methane emissions is now on the table. In tandem with the ongoing LCFS update process, we are calling on CARB to fortify the current short-lived climate pollutant strategy by kickstarting this regulatory process. Dairy emissions need to be

² Martinez, Adrian. "When Will Governor Newsom Fix Schwarzenegger's Low Carbon Fuel Standard?" *Earthjustice* (2023). <https://earthjustice.org/experts/adrian-martinez/when-will-governor-newsom-fix-schwarzeneggers-low-carbon-fuel-standard>

³ St. John, Jeff. "California's biofuel bias is hampering its EV future. Can that change?". *Energy News Network* (2024). <https://energynews.us/2024/03/13/californias-biofuel-bias-is-hampering-its-ev-future-can-that-change/>

⁴ Martin, Jeremy. "A Cap on Vegetable Oil-Based Fuels Will Stabilize and Strengthen California's Low Carbon Fuel Standard." *Union of Concerned Scientists* (2024). <https://blog.ucsusa.org/jeremy-martin/a-cap-on-vegetable-oil-based-fuels-will-stabilize-and-strengthen-californias-low-carbon-fuel-standard/#:~:text=Capping%20the%20renewable%20diesel%20boom&text=The%20California%20LCFS%20has%2C%20since,other%20secondary%20fats%20and%20oils.>

055.6 cont. treated similarly to that of landfills and oil and gas, instead of operating with only rewards as an incentive.

055.7

Furthermore, we are calling on CARB to engage in good-faith conversations with impacted community members and environmental justice groups about the legitimate harm caused by current dairy methane management practices. While some of these harms may fall outside of the agency's regulatory authority, updates to the LCFS must not add fuel to the fire. Frustration with process concerns and integration of community input thus far indicates that the CARB must take further steps to address these harms within updates to the LCFS, as well as provide greater transparency as to where the agency is unable to act.

We look forward to continued collaboration with CARB on this process to improve the critical work of the LCFS. This is an opportunity to further align the program with the state's complementary programs, however a successful update should be grounded in real climate solutions and productive opportunities for public engagement.

Regards,



Gracyna Mohabir
Clean Air and Energy Regulatory Advocate
California Environmental Voters



May 9, 2024

Rajinder Sahota, Deputy Executive Officer
Low Carbon Fuel Standard Program
California Air Resources Board
1001 I St.
Sacramento, CA 95814

RE: American Biogas Council Comments on the April 10, 2024, Public Workshop to Discuss the Low Carbon Fuel Standard

Dear Ms. Sahota,

The American Biogas Council (ABC) appreciates the opportunity to comment on the April 10, 2024, workshop to discuss the Low Carbon Fuel Standard (LCFS). The ABC is the voice of the U.S. biogas industry dedicated to maximizing carbon reduction and economic growth using biogas systems. We represent more than 400 companies in all parts of the biogas supply chain that are leading the way to a better future by maximizing all the positive environmental and economic impacts biogas systems offer when they are used to recycle organic material into clean renewable energy and soil products, thereby reducing dependency on petroleum. Biogas systems protect our air, water, and soil by recycling organic material, like food waste and manure.

Biogas systems are, at their heart, a biological means to capture methane that would otherwise be emitted into the atmosphere for use as a renewable fuel. This process specifically decreases baseline methane emissions by converting methane back into carbon dioxide. As described in the 2022 Scoping Plan Update and other supporting programs, such as SB 1383, methane is a highly potent greenhouse gas with a 100-year global warming potential (GWP), nearly 30 times that of carbon dioxide. Moreover, as recognized by CARB and many other experts, reducing methane emissions is a key strategy if the state is to meet its greenhouse gas (GHG) reduction targets. These systems protect our air, water, and soil—crucial parts of the solution to the challenges the California Air Resources Board (CARB) seeks to address.

During the April 10 workshop, CARB staff presented additional analysis and modeling on the proposed carbon intensity (CI) benchmarks, including the step-down and auto acceleration mechanism (AAM). While the 45-day package calls for a 5% step-down, CARB staff presented two additional scenarios: a 7% step-down in 2025 and a 9% step-down in 2025. ABC appreciates CARB's responsiveness to stakeholders' calls for a more ambitious approach as the ABC does not believe that the original proposal of 5% goes far enough considering the current size of the cumulative credit bank and its continued growth. As noted in our February 16, 2024, comment letter responding to the proposed LCFS amendments, the step-down must be increased to at least 7%, and we strongly urge CARB to consider being even more ambitious here and adopt a 9% step-down in 2025. With the rate at which the cumulative credit bank is growing, a strong market course correction is desperately needed to ensure that the LCFS continues to be a successful program. We further recommend that CARB retain the annual rate of CI reductions proposed in the 45-day package to complement increasing the step down in 2025 to 9%. This means that with a 9% stepdown in 2025 the 2030 CI reduction target should be 34%.

Also discussed during the workshop was the AAM, a concept that ABC strongly supports. The need for the AAM is to respond to clear overperformance of the program and to send an unambiguous market signal to investors that the program has been further improved to dynamically increase stringency to avoid a repeat of the current circumstances (e.g., excessively large cumulative credit bank, depressive credit values, pullback in clean fuels investments, and lost opportunities for GHG reductions). As proposed in the 45-day package, the first year that the AAM could impact program stringency is 2028. The ABC believes that waiting four years to see these impacts is too long, and we recommend pulling the date for triggering the AAM forward by one year. The AAM should be based on 2025 data; the same year program amendments are implemented, with the trigger assessment occurring in May 2026 and the AAM being applied in 2027, providing the correct conditions are met.

This approach better ensures that potential emission reductions are not left on the table in the event the program continues to overperform following the Board's adoption of the proposed amendments.

056.4 While not discussed in detail at the workshop, the ABC would like to reiterate the important role that biomethane plays in the program. The scientifically based design of the LCFS recognizes the benefits of projects that collect biomethane that would otherwise be emitted to the atmosphere making it available for use in transportation. As a result, millions of gallons of petroleum-based diesel fuel have been replaced with clean biomethane over the past several years delivering substantial reductions in greenhouse gas (GHG) emissions as well as other co-benefits (e.g., reductions in emissions of particulate matter). Furthermore, the ABC would like to emphasize the need for CARB to send a clear policy signal that biomethane is a necessary and effective decarbonization strategy in sectors outside of transportation (e.g. industrial, residential, commercial) if it is CARB's goal to transition biomethane out of the vehicle sector.

056.5 Lastly, the ABC would like to reiterate the absolute importance of concluding this rulemaking as soon as possible. On top of the delays we have already seen, any further delays will continue to diminish the necessary policy signal the market needs to facilitate and encourage investments in clean fuels. Thus, the ABC strongly urges CARB staff and the Board to finalize this rulemaking by mid-2024.

Thank you for the opportunity to comment on the April 10 workshop. We look forward to continued engagement with CARB staff and the refinements to the proposed amendments.

Sincerely,



Patrick Serfass, Executive Director

About the American Biogas Council The American Biogas Council is the voice of the US biogas industry dedicated to maximizing carbon reduction and economic growth using biogas systems. We represent more than 400 companies in all parts of the biogas supply chain who are leading the way to a better future by maximizing all the positive environmental and economic impacts biogas systems offer when they recycle organic material into renewable energy and soil products. Learn more online at www.AmericanBiogasCouncil.org, Twitter [@ambiogascouncil](https://twitter.com/ambiogascouncil), and [LinkedIn](https://www.linkedin.com/company/ambiogascouncil).



May 9, 2024

Rajinder Sahota
California Air Resources Board (CARB)
1001 I Street
Sacramento, California 95814

RE: Electrify America comments on California Low Carbon Fuel Standard (LCFS) Workshop

Dear Ms. Sahota:

Electrify America appreciates the opportunity to comment on the April 10, 2024, California LCFS Workshop. Electrify America is the nation's largest open network of DC fast chargers for electric vehicles (EVs), with over 3,900 ultra-fast chargers across 898 locations around the country, and over 1,100 chargers across more than 250 locations open to the public in California.

A strong LCFS is needed to support the electric vehicle market in California

The electric vehicle sector is at a critical time in California. The market for new electric vehicles was highly successful in 2023, with approximately one quarter of new vehicles deployed in the state being electric. The result has been a surge in demand for public charging that necessitates a rapid expansion of charging infrastructure. In November 2023, Electrify America reported to CARB that dozens of stations in the state are experiencing above 40% utilization, with multiple sites exceeding 50% utilization for the quarter. At 50% utilization, all charging ports at a station are in use, on average, more than 12 hours per day, or essentially during all daylight hours. Now, more than ever, it is critical that California support the installation of additional charging ports to meet the rising customer demand for clean vehicles.

The LCFS has historically been one of the State's most powerful tools for supporting clean transportation in California, including electric vehicles and charging infrastructure. As a leading charging infrastructure developer, Electrify America can attest that every dollar generated from LCFS credits goes directly back into operations and efforts to expand access to affordable, reliable EV charging. As highlighted in the workshop slides and the SRIA, the LCFS is poised to add nearly \$100 billion in value to the EV ecosystem over the next two decades.^{1,2}

However, at a time when charging infrastructure and the EV market more broadly needs to expand rapidly to achieve California's clean air, climate change, and transportation

¹ Staff presentation, slide 9.

² SRIA, Table 24.

electrification goals, LCFS credits have rapidly declined in value, with credit generation substantially exceeding deficits over the past several years, leading to a reduction in credit prices. Specifically, after many years of relative stability, the excess of banked credits began increasing rapidly around Q3 2021 and continues to accumulate. As of May 2024, spot prices for LCFS credits descended to historic lows in the \$51/MT range, their lowest levels in nearly a decade.

An increase in the step-down of at least 9% is needed

057.1

The most important thing CARB can do to stabilize the program is to quickly amend the LCFS to appropriately strengthen targets, reverse the trend of accumulating excess credits, and return the program to a state where it continues to drive investments in a broad array of low carbon fuels and infrastructure, including EV charging. Electrify America has supported the findings of the ICF analysis and in previous comments, urged CARB to propose 15-day changes to the regulation that would increase the step-down to 20-25%, and have it take effect as soon as the regulation does in 2024.

We appreciate CARB re-evaluating the magnitude of the step down in this workshop. Given the market response to the April Workshop (prices have not rebounded), the increasing likelihood that amendments do not take effect before 2025, and the fact that even a 9% step down would not clear the credit bank over the duration of the regulation,³ we believe a step down at the higher end of this range – at least 9% – is needed. We hope CARB will further evaluate the step down and even consider an 11% reduction, which would take the program to approximately 25% stringency in 2025.

A re-evaluation of 2030 targets should coincide with consideration of an increased step-down

057.2

Electrify America has participated in the coalition group working with ICF to analyze market appetite for low carbon fuels and associated appropriate targets for the LCFS. We support the overarching finding of the analysis, that a 2030 target of greater than 40% is appropriate and can be readily supported by the market. A target of at least 40% by 2030 is likely necessary to align with California's climate change goals and Scoping Plan outcomes, as well, which calls for a 40-48% reduction in greenhouse gas emissions by 2030. Given the fact that transportation fuel pathways account for about half of California's greenhouse gas emissions, LCFS targets that align with statewide greenhouse gas reductions are reasonable.

If nothing else, we suggest maintaining the current annual reductions from 2025-2030 envisioned in the proposed amendments (that is, 2.25 percentage points per year), *in addition* to an increased step down in 2025. With a 9-11% step down taking 2025 stringency to 22.75-24.75%, this would translate to a 2030 target of 34-36%. As indicated by the ICF analysis, this target is readily achievable, and we believe it is necessary – coupled with a stronger step-down

³ According to the staff presentation, slide 47, a 9% step-down would draw the bank down by 27 million credits from 2024-2046. This is likely less than the credit bank that will exist by the end of 2024.

057.2 cont. and more responsive auto acceleration mechanism – to maintain a healthy LCFS market to support the state’s transportation electrification goals.

The auto acceleration mechanism (AAM) is an important element of a strengthened LCFS, and should be made more responsive to market conditions

We agree with the sentiment expressed at the workshop that CARB should aim to get the targets correct in their own right, rather than relying on the AAM to “find” the right target. As described above and in previous comment letters, we firmly believe getting the targets right requires an approximately 9-11% step down in 2025 and 2030 targets on the order of 35-40%. The AAM should serve as an *additional* element to support the program, should innovation or other market developments that cannot be currently forecast lead to greater credit generation than anticipated.

057.3 We appreciate the workshop (slide 49) requesting additional feedback on potential changes to the trigger mechanism for the AAM. Per our previous comments, we encourage 15-day changes that would modify the AAM so that it:

- Would be triggered when banked credits exceed 2-2.5 times quarterly deficits.
- Can apply to calendar year 2025 data, potentially be triggered in 2026, and the compliance schedule can be potentially pulled forward starting in 2027.
- Can be triggered in consecutive years if market conditions warrant.

These changes would allow the AAM to be more responsive to market conditions that warrant ratcheting program stringency, without creating undo risk for the program.

Comments on additional elements to support transportation electrification

Finally, we reiterate our previous comments on other aspects of the Proposed Amendments:

- 057.4 • We support the proposed capacity crediting provisions for zero emission vehicle infrastructure, including shifting FCI crediting proposals to medium and heavy-duty vehicles (MHD-FCI) and targeted deployments for light-duty vehicles (LD-FCI).
- 057.5
- 057.6 • We support amendments to clarify that the owner of EVSE at multi-unit dwellings that is not serving a dedicated or reserved parking space is eligible to generate credits.

Thank you again for the opportunity to comment on the April 10 workshop, and for considering revisiting the step down. We hope CARB will also revisit the 2030 target and AAM triggers, in order to ensure a strengthened program that supports the state’s climate change and clean transportation goals in the near-term, and beyond.

We appreciate CARB’s efforts to support the transition to EVs in California and look forward to continuing to work with CARB through the LCFS amendment process and in other forums to

advance the State's transportation electrification and climate change goals. Please do not hesitate to reach out with any questions.

Sincerely,

/s/

Rhiannon Davis
Director of Government Affairs
Electrify America, LLC



May 9, 2024

Matthew Botill
California Air Resources Board (CARB)
1001 I Street
Sacramento, CA 95814

Re: Brimstone's Comments on the April 10th California Low Carbon Fuel Standard Workshop

Dear Mr. Botill:

Brimstone appreciates the chance to comment on the California Low Carbon Fuel Standard (LCFS) April 10, 2024, Workshop. Brimstone supports California's climate change goals, including achieving carbon neutrality and net-negative greenhouse gas emissions by 2045. We support 15-day changes to adopt a more stringent step-down to strengthen the market and remove excess credits. We also strongly encourage additional 15-day changes to accommodate additional carbon removal protocols that may be developed through the SB 905 process or otherwise, including mineralization of carbon dioxide from the atmosphere and ocean.

About Brimstone

Brimstone is a California-based company, headquartered in Oakland, with a deeply decarbonized process for making ordinary portland cement. Traditionally considered one of the toughest materials to decarbonize, the cement industry has nearly the same greenhouse gas impact as all the world's cars on the road today.

Our process produces ordinary portland cement—the type of cement used in virtually all construction—from carbon-free calcium silicate rocks, rather than limestone. This avoids the 60% of emissions that come from cement's traditional feedrock and also produces a magnesium byproduct that passively mineralizes CO₂ from air, permanently storing it as magnesite rock.

Brimstone is upending the conventional wisdom that CO₂ emissions are a necessary to manufacture cement and that the only way to decarbonize its production is by accepting the cost and complexity of carbon capture. We are also proving that avoiding carbon emissions and removing them from the air can, and ideally do, go together.

A step-down of at least 9% needed to support a strong LCFS market

We appreciate CARB re-evaluating the targets proposed in the program. As noted in the workshop, further step-downs in near-term stringency of the program are likely needed to

remove surplus allowances and ensure the LCFS continues to drive additional investment in low-carbon fuels, carbon dioxide removal, and cleaner transportation. We therefore support strengthening the step-down to at least 9% in 2025--and further strengthening the 2030 target to ensure greenhouse gas emissions outcomes that align with CARB's 2022 Scoping Plan.

058.3

LCFS amendments should allow mineralization or other potential new carbon removal or DAC protocols to be used if they are adopted separately

Currently, the LCFS stands out as one of the few global markets for carbon capture, removal, utilization, and storage (CCRUS). We encourage CARB to leverage this powerful tool to support development of carbon dioxide removal technologies and strategies needed to meet the state's climate change goals. We hope CARB will consider additional carbon removal and storage protocols to accommodate new credit-generating pathways under the LCFS, including direct air capture (DAC) of carbon dioxide via mineralization and enhanced rock weathering.

While developing new CCRUS protocols is beyond the scope of the current rulemaking, CARB may adopt them separately through the SB 905, SB 27, or other processes. Accordingly, we encourage CARB through 15-day changes to ensure that, if and when new protocols are adopted, new carbon removal strategies and technologies will be immediately eligible to generate credits under the LCFS. Specifically, regulatory text should simply refer to the CCS Protocol by reference, and not include other limiting factors or definitions related to DAC or CCS projects, including references to geologic sequestration, pipeline transport of CO₂, or other parameters that might bias and limit future technologies and applications of CCRUS.

This will allow new CCRUS strategies to be deployed on a tech-neutral basis, if and when they adhere to adopted protocols by CARB, without needing to go back and amend the LCFS again. Broadening the definition of eligible DAC projects and carbon removal strategies will unlock solutions with significant potential for widespread impact, crucial for meeting California's carbon neutrality goals.

Conclusion

Thank you again for the opportunity to comment on the recent LCFS workshop. We look forward to working with you and other stakeholders through the LCFS process, SB 905 implementation, and other forums to keep the state on track to meet and exceed its climate goals. Please do not hesitate to reach out if you have any questions about Brimstone or these comments.

Thank you,

Simon Brandler
VP of Policy & Public Affairs
Brimstone

Date: May 9, 2024

To: California Air Resources Board 1001 I Street, Sacramento, California 95814

From: Jack Lucero Fleck, 350 Bay Area (Organization for identification purposes; our full team has not been able to review these comments)

Re: Amendments to the Low Carbon Fuel Standard

Redirecting the Low Carbon Fuel Standards (LCFS) Program Away from Biofuels toward Electrification

Summary

The LCFS program awarded about \$3.3 billion in credits in 2022. Of these \$2.5 billion went to biofuels (biomethane, biodiesel, ethanol, renewable diesel) and \$0.8 billion went to electrification of transportation. (See Addendum I for details) This paper argues that most of LCFS credits should go to electrification.

Two key asks:

CARB members—do not approve increases in liquid biofuel or biomethane pathways, i.e. cap these credits at existing levels.

CARB staff—review and consider these cost effectiveness calculations along with environmental and health impacts and equity considerations.

There are many important reasons for the LCFS to stop supporting biofuels, or at least put a cap on the existing levels of support, and to shift LCFS to increase support of electrification of transportation.

- 059.1 • Numerous arguments against biofuels, particularly detailing environmental impacts, are laid out in this [letter](#) signed by dozens of environmental justice, health and climate organizations.
- 059.2 • The case against the continued expansion of biodiesel and renewable diesel as consuming unsustainable amounts of land is further argued [in this paper](#).
- 059.3 • Since roughly $\frac{3}{4}$ of Greenhouse Gases (GHGs) from transportation come from cars, $\frac{3}{4}$ of LCFS credits should go to EVs. (This paper does not examine ethanol; we do note, however that ethanol cannot deliver zero emission transportation.)
- 059.4 • Equity is an important benefit to using LCFS credits to help low income people obtain EVs, rather than having the credits go to refineries and large dairies.
- 059.5 The main point of this paper is that the **cost effectiveness**—cost per metric ton (MT) of GHGs reduced—of using LCFS credits to support electrification would be better than

059.5 cont. using credits for biofuels made from soy oil. Note that the lower the cost per MT of GHG reduction, the more cost effective a fuel type/LCFS support action is. Table I shows the results of calculations in Addendum III comparing cost effectiveness of LCFS fuel types. **Feedback on any assumptions, calculations or conclusions in this paper are welcomed!** See Addendum II for an explanation of Carbon Intensity (CI), which is used in these calculations.

Table I Comparison of Cost Effectiveness of LCFS Fuel Types

Fuel Type/LCFS support	Cost per MT of GHG reduction
Electricity–Funding EV purchases & chargers	\$96
Biodiesel / Renewable Diesel including used cooking oil	\$114
Biodiesel/Renewable Diesel from soy oil	\$142
Heavy duty ZEV truck chargers	\$152 - 250
Biomethane with -99 Carbon Intensity (2022 average)	\$123
Biomethane with 30 Carbon Intensity	\$707
Using solar to support Level 2 EV chargers	\$109 - 532
Using solar to support DC fast chargers	\$196
Using grid electricity	\$354

059.6 Table I shows that redirecting the LCFS program to support targeted EV purchases and chargers is a cost effective strategy. LCFS credits should be focused on low and moderate income gas “superusers” to achieve the LCFS and the State climate, equity and cost effectiveness goals.

The numbers support a policy of putting a cap on all existing biodiesel, renewable diesel (with a possible exception for Used Cooking Oil (UCO) as a feedstock) and biomethane credits. With this cap, existing biofuel production would continue, at least for the next few years, until it is phased out as LCFS stringency increases. Most credits would be directed to electrification, where they are more cost effective, least environmentally destructive, and most equitable—a win-win-win.

059.7 Regarding the current use of funds to support electrification, the argument of this paper is that most of the LCFS program should be directed toward helping low income people who currently need to drive many miles, i.e. gas superusers, switch to an EV. Currently most of the electricity credits go to charging with renewables and/or to biomethane,

which are less cost effective ways to spend the LCFS funds. Addendum IV discusses this in more detail.

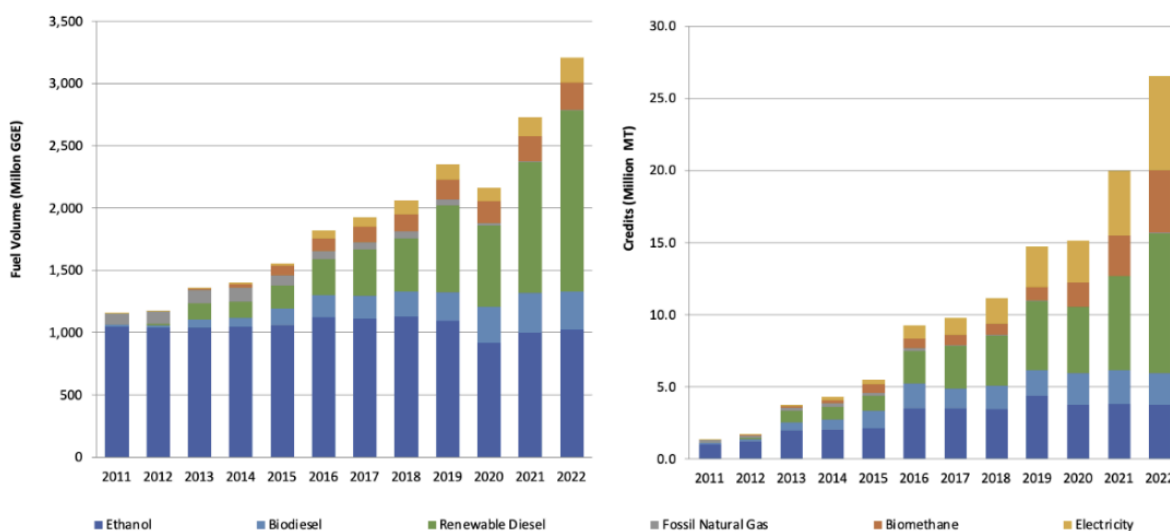
059.7 cont.

CARB has a choice to make. The LCFS program can continue its massive biofuel subsidies, or it can redirect LCFS to focusing its credits electric vehicles—cars, trucks and buses— as well as EV chargers. This redirection would be a great improvement for equity and environmental justice as well as for the climate. This conclusion is supported with calculations and further discussion in Addendums III and IV below.

Addendum I: How much are the current LCFS credits worth?

In 2022, the LCFS program gave credits as shown in Figure 1 below: (CARB LCFS dashboard)

Figure 1—Volumes and Credits in the LCFS Program
(from [LCFS Dashboard](#), Fig 2 spreadsheet)



With credits having a weighted average of \$125 per MT (Credit Price series from [LCFS Dashboard, Fig 4](#)) in 2022, the total credit values came to \$3.3 billion as shown in Table 2:

Table 2: Value of Credits in LCFS program 2022
(from Fig 2 spreadsheet in LCFS dashboard)

Credits (million MT)	2022	2022 Value - Millions of \$
Biodiesel	2.2	\$276
Biomethane	4.3	\$543
Electricity	6.5	\$817
Ethanol	3.7	\$468
Renewable Diesel	9.7	\$1,212
		\$3,316

Table 2 shows that \$817 million were credited to electricity, while \$2.5 billion went to biofuels, including \$2 billion to biodiesel, renewable diesel, and biomethane.

Addendum II - Explanation of Carbon Intensity

The key to understanding the LCFS is Carbon Intensity (CI). Each alternative fuel has a carbon intensity that is measured in grams of CO₂ equivalent (CO₂e) per megajoule of energy (g/MJ). CO₂e includes greenhouse gases other than CO₂ by converting the amounts of these gases to the equivalent amount of CO₂. A joule is a measure of energy—it's a small number—1 kilowatt hour is equal to 3.6 million joules, or 3.6 MegaJoules (MJ).

Gasoline (CARBOB) has a CI of 101 as shown in Figure 2. source: [page 17 of LCFS Basics with Notes](#).

Figure 2

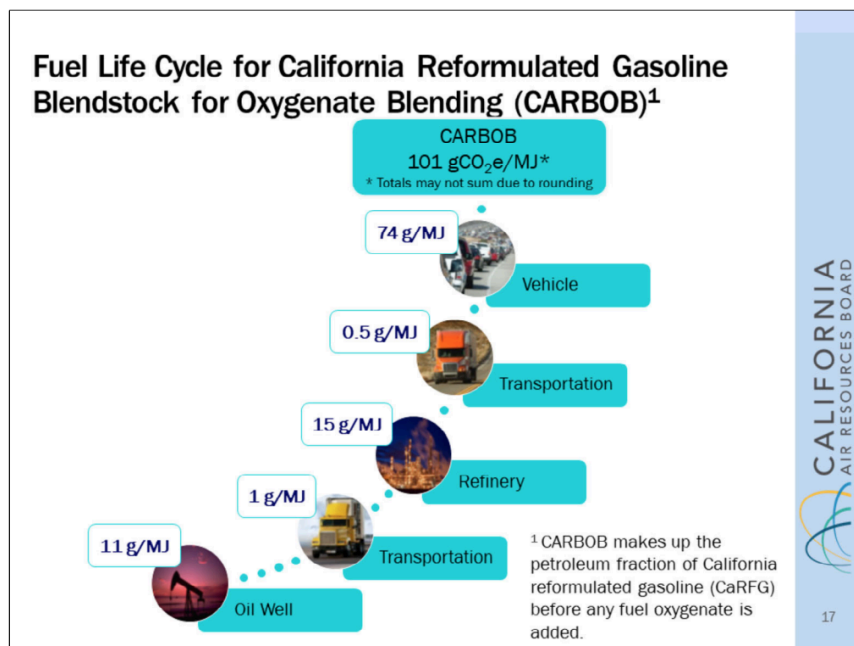


Figure 1 in Addendum I shows the volumes of alternative fuels and the credits that they earn. One credit represents 1 metric ton (MT) of GHG reduction. Fuels with a Carbon Intensity (CI) higher than the target (aka “the benchmark”) pay to the LCFS to subsidize the fuels with lower CIs. The current benchmark is around a CI of 90; so gasoline with a CI of 101 has to pay for exceeding the benchmark. The lower the CI, the higher the credit—e.g. as shown in Fig. 1, biomethane has a small volume of sales, but earns a high number of credits. This is because it has a negative CI, which is discussed in Addendum III.

Addendum III – Calculations of Cost Effectiveness

A. Electric Vehicles Calculation and Discussion

The calculations below show that using LCFS credits to support purchase of EVs and chargers for targeted individuals can reduce GHGs at a cost of \$96 per metric ton, i.e. well below the cost for biofuels.

Electric Vehicle Calculation

Assume LCFS incentives of \$10,000 for a new EV, and \$5,000 for a used EV, and that used EVs are limited to ½ of new EVs in the program.

Estimating 210 grams per kwh for California electricity (see Fig 3 from CARB below)

Estimating 12,000 miles per EV at 2.6 miles per kwh = 4600 kwh per EV per year

$4600 \times 210 \text{ grams} = 969,000 \text{ grams} = 1.0 \text{ Metric tons of GHGs per EV per year}$

Internal combustion Engine Vehicle (ICEV) at 12,000 miles / 25 miles per gallon x 25 lbs GHG per gallon (includes refining) x .9 CI adjustment for ethanol = 10,800 lbs of CO₂

$10,800 \text{ lbs of CO}_2 / 2200 \text{ lbs/MT} = 4.9 \text{ MT per ICEV per year}$

Savings per car per year = 4.9 MT - 1.0 MT = 3.9 MT saved per EV

The calculation above assumes an average user with 12,000 miles per year. However, if CARB directed the subsidies to gas “superusers”, i.e. drivers who use more than 1000 gallons of gas per year, say 24,000 miles per year, then the savings per EV per year is doubled to 7.8 MT as calculated below:

24,000 miles divided by 2.6 miles per kwh = 9,200 kwh

$9200 \times 210 \text{ grams/kwh} = 1.9 \text{ metric tons for an EV}$

ICEV 24,000 /25 mpg = 960 gallons x 25 lbs x .90 = 21,600 lbs of CO₂

$21,600/2200 \text{ lbs/MT} = 9.8 \text{ metric tons for a ICEV}$

Then an EV saves $9.8 - 1.9 = 7.9 \text{ MT per car per year}$

This assumes that the superuser turns in their old car for junk.

Assuming \$10,000 to incentivize purchase of a new EV and \$5000 for a used EV with $\frac{2}{3}$ new and $\frac{1}{3}$ used, with \$1.5 billion in subsidies, that would be = 120,000 new EVs and 60,000 used EV sales

New EV purchase:

$120,000 \text{ cars} \times 7.9 \text{ MT per car} \times 15 \text{ year life of a car} = 14.2 \text{ MMT}$

Used EV purchase: assume

–60,000 used EVs.

–used car has a life expectancy of 7.5 years.

–no change in total vehicles (i.e. disposing of one car results in buying one more). There are 2 considerations:

- a. These used EVs were being driven by regular users–i.e. 12,000 miles / 2.6 mi/kwh = 4600 kwh per year per car. $4600 \text{ kwh} \times 210 \text{ g/kwh} / 1,000,000 \text{ g/MT} = 1.0 \text{ MT per car}$. With a superuser, this would increase to 2.0 MT per car. This 1.0 MT increase totals:
 $60,000 \text{ cars} \times 1.0 \text{ MT} \times 7.5 \text{ years} = 0.5 \text{ MMT increase in GHGs}$.

- b. But assume that there is a 50% chance that the person who sells the EV buys a new EV, or is part of a series of EV used car purchases that lead to buying a new EV. [Estimates](#) vary from 50% to 80% of this probability; the calculations here use the lower number (50%) to be conservative. If the seller does buy, or lead to a purchase of, a new EV, there is a net of one less ICEV on the road, which is a savings of 3.9 MT per car. 60,000 cars x 50% EVs x 3.9 x 15 years = 1.8 MMT. This assumes that the new EV buyer is not a superuser.

This gives a net GHG decrease for 60,000 used EVs of $1.8 - .5 = 1.3$ MMT.

Combining new and used results gives a total GHG reduction of $14.2 + 1.3 = 15.5$ MMT

Using an LCFS total of \$1.5 billion/ 15.5 MMT = **\$96 per metric ton** as shown in Table 1.

Figure 3 – 2021 GHG Emissions by Scoping Plan Sector & Sub-Sector

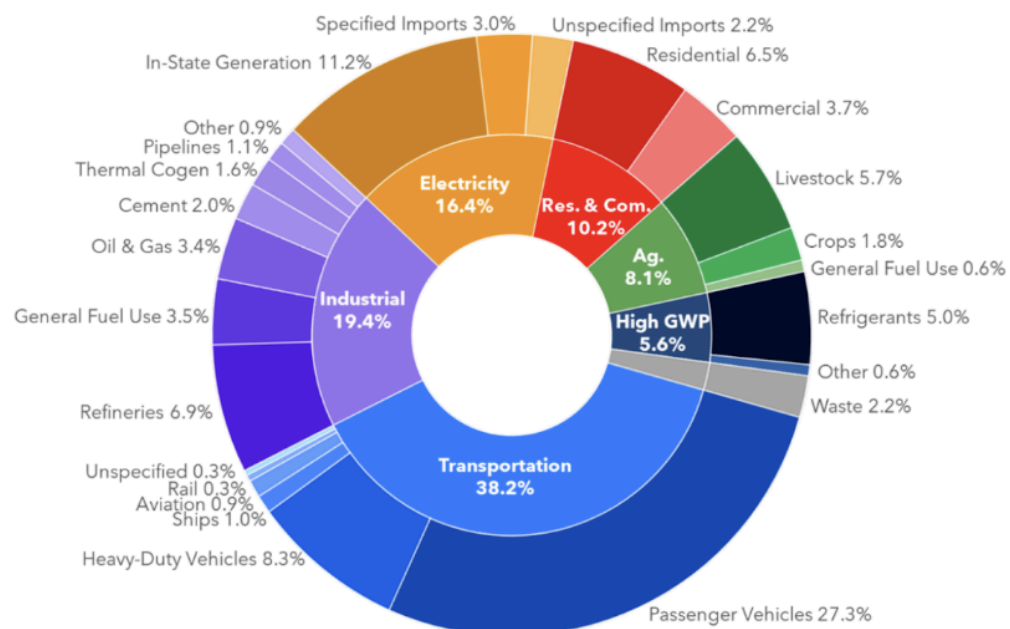


Figure 6 shows 2021 GHG emissions by Scoping Plan category. The inner ring shows the Scoping Plan sectors, while the outer shows the sub-sectors. Values do not sum to 100% due to independent rounding.

$$11.2\% \text{ electricity} \times 381 \text{ MMT} = 42.6 \text{ MMT/203TWH (in state)} = 210 \text{ g/kwh}$$

$$(42.6 \times 10^{12} \text{ grams} / \underline{203 \times 10^9 \text{ kwh}} = 210 \text{ g/kwh})$$

EV Discussion:

The LCFS program currently supports the Clean Fuel Reward (CFR) program, which provides upfront incentives for purchasing or leasing a new EV in California. So the concept of using LCFS funds to support EV purchases is already a part of the LCFS program.

California had [26 million registered cars](#) with 5.3 million new and used car sales in 2023. ([1.8 million new](#) and [3.5 million used](#), based on 10% of national used car sales) If the LCFS can only subsidize the purchase of 180,000 EVs (plus chargers) per year, it is important that the money be spent wisely—i.e. where it is most cost effective. If 10% of these 5.3 million cars are owned by gas superusers, that would be 530,000 cars. If half of those are low/moderate income, then that would be 265,000 superusers to target for EV purchases with LCFS support. The LCFS credits should focus on these car buyers to achieve the maximum benefits.

The calculations above suggest that used EV subsidies should be considerably less than new EV purchases given their more than 80% lower cost effectiveness—7.9 MT per new EV vs 1.3 MT for a used EV. But equity considerations for low income drivers support giving some subsidies for used EVs. The 50% lower subsidy used here could be lowered more, or the number of used EVs allowed could be decreased, both of which would improve the cost effectiveness of the program, but would reduce equity for low income car buyers.

Another criticism is that the \$96 figure takes all the credit for the EV purchase, when other subsidy programs also can contribute. For example, if a car also receives a \$7500 federal tax credit then the \$10,000 could be seen as only contributing $10,000/17,500 = 57\%$ of the incentive, for a cost effectiveness of \$168/MT.

There is no doubt that the cost effectiveness calculations have a lot of uncertainty, both plus and minus. However, these calculations show that EV incentives are highly competitive with biofuel subsidies.

B. Biodiesel and Renewable Diesel

The calculations below show that the \$1.5 billion that the LCFS credited to biodiesel and renewable diesel (from Table 2) yielded 13.2 million metric tons of GHG reduction. $\$1.5 \text{ billion} / 13.2 \text{ million} = \text{\$114 per metric ton of GHG reduced}$, as shown in Table 1.

Data in Tables 3 and 4 is from the spreadsheet attached to [Fig 2 in the LCFS Dashboard](#). Table 3 shows the CI for various fuels. In 2022 the CI for biodiesel averaged 28, and for Renewable Diesel averaged 37.

Table 3 – Carbon Intensity averages for LCFS Fuel Types

CI Avg	2022				2023			2022 Average
	2022Q1	Q2	Q3	Q4	2023Q1	Q2	Q3	
Ethanol	58.47	59.71	59.39	59.21	60.09	60.47	61.32	59
Biodiesel	27.32	27.62	29.05	29.99	32.41	28.42	30.5	28
Renewable Diesel	35.78	35.95	38	38.1	41.51	43.74	43.01	37
Bio-CNG	-61.4	-103.67	-111.5	-119.2	-93.03	-131.36	-132.15	-99
Bio-LNG	53.96	54.4	55.04	54.35	49.82	49.5	48.59	54
Electricity	27.04	27.68	24.09	41.35	42.48	47.94	48.19	30
Alternative Jet Fuel	22.67	45.46	42.36	42.41	47.16	36.67	48.75	38
Hydrogen	34.01	24.54	32.14	39.66	31.11	47.94	34.11	33

Table 4 shows the volumes of fuels in gallons of gas equivalent (gge). Using gge allows the LCFS to compare the fuels with the same standard of measure.

Table 4 Volume of fuels in LCFS (gge = gallons of gas equivalent)

Conversion to gge using energy density from Table 3 in the LCFS regulation	2022 totals (gge)	Rounded total for 2022 (million gge)
Biodiesel	306,166,029	306
Biomethane	221,146,628	221
Fossil Natural Gas	15,615,972	16
Electricity	218,472,981	218
Ethanol	1,025,105,423	1025
Renewable Diesel	1,560,372,740	1560
Other (Hydrogen, AJF, Renewable Naphtha, Propane)	61,685,509	62

Table 5 shows the calculation of GHG reductions from biodiesel and renewable diesel using CI 101 for fossil diesel and using CI = 28 for biodiesel and CI = 37 for renewable diesel from Table 3 above:

Table 5 Total GHG reduction from biodiesel and Renewable Diesel in 2022

Biodiesel	28/101	72% reduction	306 million gal x 25 lbs/gal / 2200lbs /MT =		3.5 MMT	x 72% =	2.5 MMT
Renewable diesel	37/101	63% reduction	1560 mil gal x 25 / 2200 =		17 MMT	X 63% =	10.7 MMT
							13.2 MMT total

For comparison, the same credit total of \$1.5 billion would result in 15.5 MMT reduction for EVs – \$96 per MT vs \$1.5 billion/13.2 MMT for biodiesel and renewable diesel = **\$114 per MT** as shown in Table 1.

C. Zero Emission Trucks and Buses

Sections A and B above show that use of LCFS credits to fund light duty EVs would be more cost effective than using the credits for biodiesel or renewable diesel. But can LCFS funding of zero emission trucks and buses compete with these biofuels? The argument is that heavy duty vehicles are more difficult to decarbonize than light duty vehicles. Therefore, biofuels can act as a bridge fuel to give us a start on reducing emissions for heavy duty vehicles.

What do the numbers show?

It is true that the technology and the market for light duty vehicles is more advanced than for trucks and buses. However, [CARB, in its Advanced Clean Fleets](#) program argues that lower total cost of ownership of ZEV trucks are “expected to deliver a net savings of \$48 billion to fleets,” plus a savings of \$26.5 billion in statewide health benefits from criteria pollutant emissions. If CARB, or other government agencies, can use loans from low interest revenue bonds to finance the upfront costs, taking advantage of lower operating costs, then the issue becomes focused on charging infrastructure.

Emissions from an average truck – This calculation estimates that a typical medium duty or drayage truck emits about 28 MT of GHGs per year:

–20,000 miles per year

–8 miles per gallon

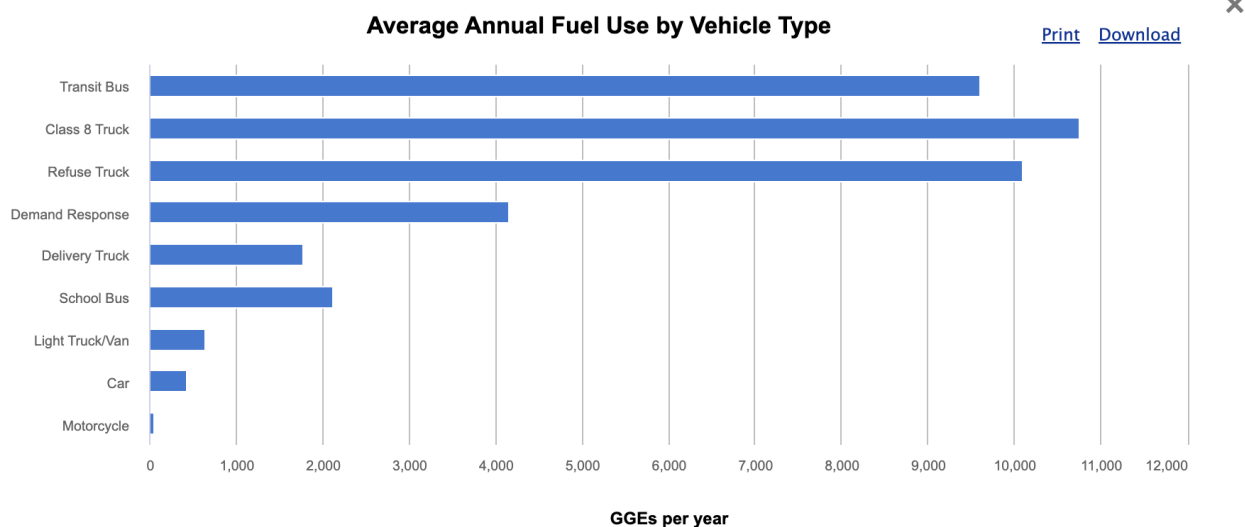
– $20000/8 = 2500$ gallons / year x 25 lbs of GHGs/gal / 2200 = 28 MT per truck per year.

These assumptions are estimated from Figures 4, 5, & 6 below ([source](#)) Figure 4 shows that some heavy duty trucks and transit buses use around 10,000 gallons per year, which would emit 115MT of GHGs per truck or bus. However, it is likely that these mileage numbers would exceed the current capability of battery operated trucks and buses. A separate analysis of hydrogen fuel cells and advances in battery technology would be required to compute cost effectiveness for various optional technologies, but that is beyond the scope of this paper.

An exception to this is school buses, which have much less annual mileage and fuel use. Also school buses have greater opportunity for charging since they are used fewer hours per day. California has about 25,000 school buses. Assuming a lifetime of

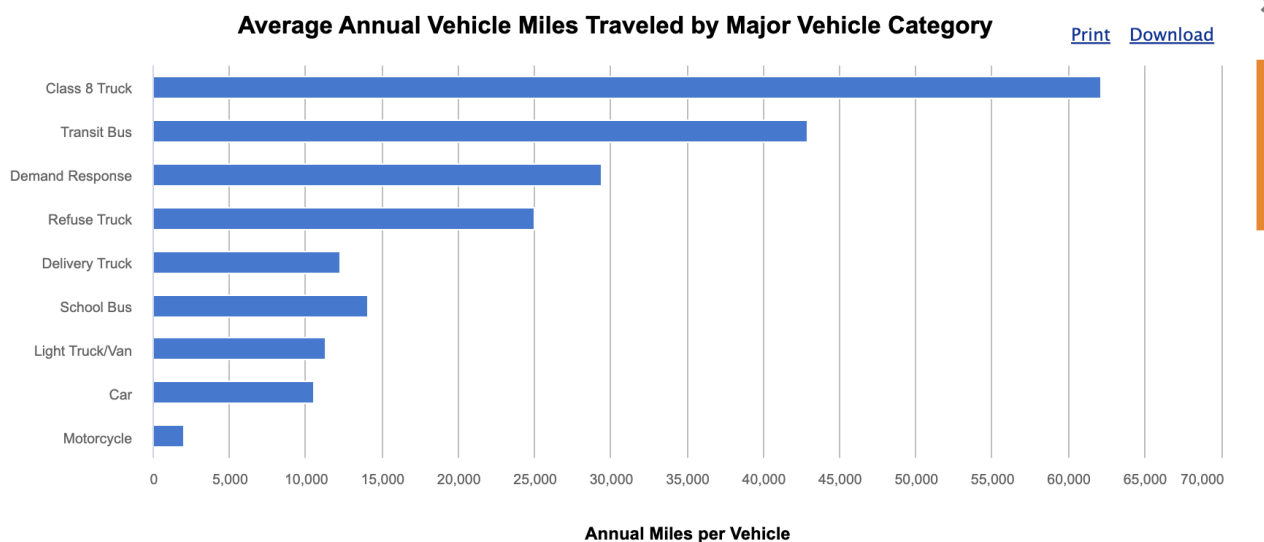
15 years, the state needs to replace 1,667 per year. If a subsidy of \$100,000 combined with other financing programs helps to buy new school buses and relatively low cost Level 2 chargers, the total cost would be 1,677 buses x \$100,000 = \$167 million. This should be easily affordable for the LCFS.

Figure 4 – Fuel Use for Different Truck/Bus Types



Last updated: February 2024

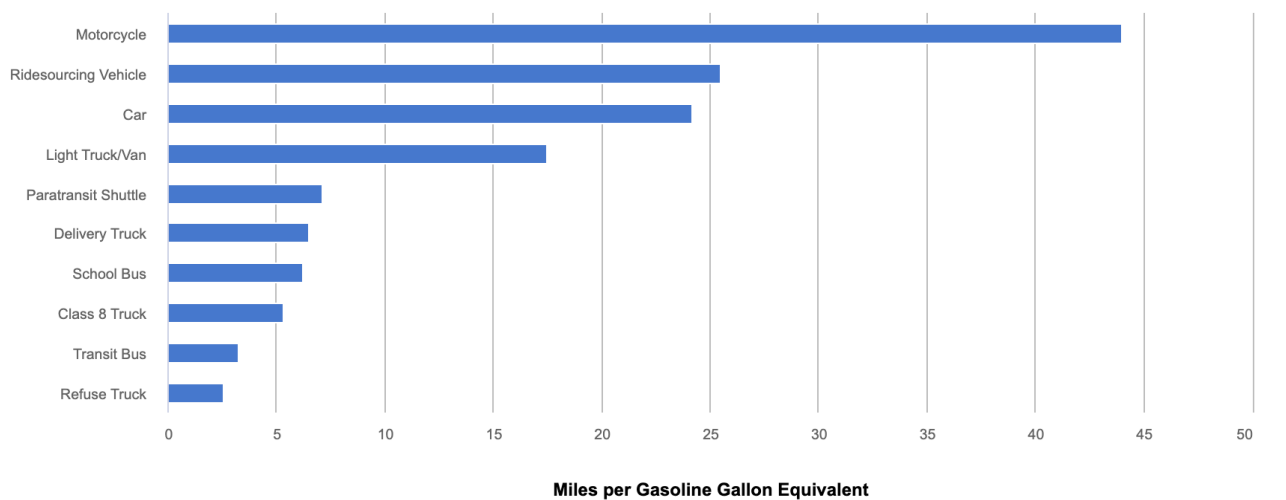
Figure 5 – Mileage by Truck/Bus Types



Last updated: February 2024

Figure 6– Fuel Economy by Vehicle Type
Average Fuel Economy by Major Vehicle Category

[Print](#) [Download](#)



Last updated: February 2020
 Printed on: March 22

Emissions from an electric medium duty truck—This calculation estimates that an electric truck would average 5 MT of emissions per year.

Assume: 0.9 miles per kwh ([average of several trucks from this source](#)) and assume 210 g/kwh (Fig 3 above)

20,000 miles / .9 miles per kwh = 22,000 kwh

22,000 kwh x 210 grams/kwh / 1 million g per MT = 4.6 MT, say 5 MT

Compared to fossil diesel, the savings would be 28 - 5 = 23 MT per year

Note that these reduced emissions would be further reduced every year as the electricity grid gets cleaner. On the other hand, there is little reason to believe that emissions from biofuels would be reduced significantly over time; in fact these emissions could be increased as land use charges (see below) are re-evaluated.

Cost of Battery Electric Trucks chargers (admittedly this is a very limited sample—additional references would be welcomed)

The Port of Oakland is installing 145 chargers for drayage trucks for an estimated \$50 million—\$345,000 each. This comes to \$360 per MT of GHG reduction based on this calculation

The Port of Oakland (Port) was awarded a Trade Corridor Enhancement Program (TCEP) grant in the amount of \$41,635,000, which requires \$17,841,000 of matching funds for a total of about \$60 million. This covers costs for the Port to plan, design and install:

- 145 chargers for battery- electric heavy duty trucks and cargo handling equipment in the Seaport;
- one megawatt (MW) of solar panels;
- up to 6.5 MW of battery storage;
- associated substation upgrades.

I estimate that the solar panels and storage that go with this project will cost about \$10 million, so the cost of the chargers and substation upgrades is \$50 million. This comes to \$345,000 each for 145 chargers. If a charger can service 3 trucks a day, then the cost per truck would be about \$115,000. Using a savings of 23 MT per year for 20 years (20,000 miles per year per truck), that is 460 MT saved per truck. The cost would be $\$115,000/460\text{MT} = \text{\$250 per MT}$.

However, [this article](#) about ZEV chargers in Illinois describes 100 chargers costing \$21 million—\$210,000 each. This would be more cost effective than the Port of Oakland Project with about \$152 per MT emission reductions.

Illinois calculation: $\$21 \text{ million} / 100 \text{ stations} = \$210,000 \text{ per station}$.

Again $23 \text{ MT per year} \times 20 \text{ years} = 460 \text{ MT saved per truck}$.

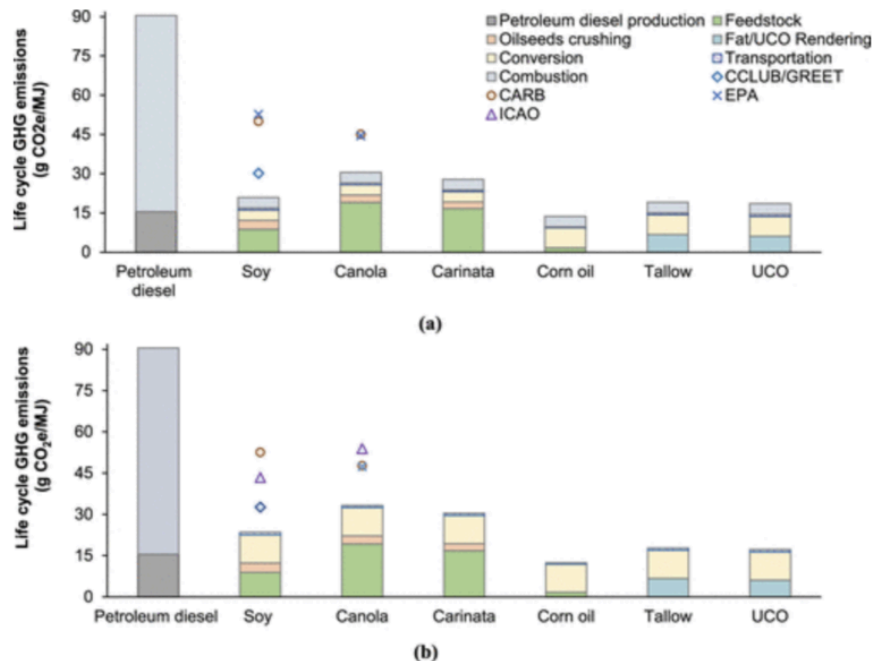
Each station serves 3 trucks per day = $\$70,000 \text{ per truck} / 460\text{MT saved over 20 years} = \text{\$152 per MT}$

How does that compare to the current biofuel credits? As discussed in Addendum III - B above, the GHG reductions from biodiesel and renewable diesel average \$115 per MT, which is well below both the Port of Oakland figure and the Illinois figure.

However, the CI for soy oil (about 50 as shown in Figure 7 below) is much higher than the CI for used cooking oil and tallow (around 15). Therefore, if we compare the cost effectiveness of soy oil with ZEV trucks, the results are closer. A CI of 50 results in a 50% reduction in GHGs compared to fossil diesel. Adding 306 million gallons of biodiesel to 1560 million gallons of renewable diesel in 2022 gives 1866 million gallons total produced (Table 4 above). As before, assuming 25 lbs of GHGs per gallon / 2200 lbs per MT gives:

$1866 \text{ million gallons} \times 50\% \text{ reduction} \times 25 \text{ lbs per gallon GHGs} / 2200 \text{ lbs per MT} = 10.6 \text{ MMT reduction}$. This gives a cost effectiveness for diesel made from soy oil: $\$1.5 \text{ billion} / 10.6 \text{ MMT} = \text{\$142 per MT}$

Figure 7 – CI of biofuels using various feedstocks



Source: <https://pubs.acs.org/doi/10.1021/acs.est.2c00289>

Figure 7 below shows the carbon intensity (CI) of both biodiesel (Fig 7a) and renewable diesel (Fig 7b). The CI of these biofuels have an added Land Use Charge of 30 for Soy and Canola, but not Corn Oil, Tallow and Used Cooking Oil (UCO). The land use charge is assessed because of these feedstocks' impact on food supplies and forests.

The low CI score for corn oil is not without controversy, but that is beyond the scope of this paper.

As noted above, the current 210 g/kwh for electricity generation should drop steadily as California aims to reach 90% clean electricity by 2035. These changes would bring the cost effectiveness of zero emission trucks below biofuels made from soy oil very soon, and eventually below Used Cooking Oil as well

These calculations support continued use of UCO for biofuels, but placing a cap on Soy Oil.

D. Biomethane

Biomethane Calculations

CARB estimates that biomethane production totaled 221 million gallons gas equivalent (gge) (Table 4) and that total credits for biomethane were valued at \$543 million (Table 2)

Using Carbon Intensity = -99 (Table 3; note that this is a NEGATIVE number) gives an estimated savings of 4.4 MMT:

Gasoline has a CI of 101 and produces 25 lbs of GHG per gallon

A CI of -99 would be a decrease of 200 CI: $101 - (-99) = 200$ CI

The credit would be increased by $200/101 = 2.0$ times

This is the equivalent of assuming that a ICEV produces $2.0 \times 25 \text{ lbs/gal} = 50$ lbs/gal of GHGs compared to a zero emission vehicle

$221 \text{ million gallons} \times 50 \text{ lbs per gallon} / 2200 \text{ lbs per MT} = 4.4 \text{ MMT}$

This is a cost effectiveness of $\$543 \text{ million} / 4.4 \text{ MMT} = \textbf{\$123 per metric ton of GHG reduction}$

Using a more realistic CI of 30, would result in a CI reduction of $71/101 = 70\%$. Using $25 \text{ lbs/gallon} \times 30\% = 7.5 \text{ lbs per gallon}$. $221 \text{ million gallons} \times 7.5 \text{ lbs/gal} = 1658/2200 = .75 \text{ MMT of GHG}$. $\$543 \text{ million} / .75 \text{ MMT} = \707 . **This would be \$707 per MT GHG reduction.**

As previously calculated, if the money were spent on EVs instead of biomethane, the cost per metric ton of GHG reduction would be **\$96 per MT**. The total GHG reduced would be $\$543 \text{ million} / \$96 \text{ per MT} = 5.7 \text{ MMT}$ rather than 4.4 MMT using a CI of -99, and 0.75 MMT using a CI of 30.

Biomethane Discussion

Similar to liquid biofuels, biomethane cannot compete with subsidies to EVs, even with an exaggerated CI of -99. Using CI = negative 99 (the 2022 average for biomethane), gives a cost effectiveness of \$123 per MT, compared to \$96 for EVs. Using a more realistic CI of 30 for biomethane would increase the cost per MT to \$707 MT. The only way biomethane can stay competitive is to assume a large negative CI. This requires the assumption that methane is an unavoidable byproduct of dairy farming, which is not a valid assumption.

Also, methane/natural gas comprises less than 1% of transportation fuel, so biomethane will never achieve a significant reduction in GHGs from transportation. Likewise, if used to make electricity or hydrogen, biomethane would produce a very tiny amount of electricity or hydrogen needed. By comparison, EVs already constitute about a 6% reduction in GHGs from transportation, and this increases with every EV sold.

Addendum IV - Cost Effectiveness of Electrification Options

The calculations below show that subsidizing solar plus storage is comparable to the cost effectiveness of subsidizing EV purchases. The calculations are very approximate since calculation details for cost effectiveness of different pathways are not readily available. We recognize that this topic needs more detailed analysis and development, and we hope to work with CARB and staff to develop these ideas further.

Table 6 shows that most electricity credits go to charging. The amount for supporting purchases of new and used EVs does not make the chart.

Table 6– Electricity Credits

Electricity Credits	2022				2023			
	2022Q1	Q2	Q3	Q4	2023Q1	Q2	Q3	
Fuel Application Type								
Electricity – Onroad EV charging – LDV/MDV	-	-	-	-	-	-	-	-
Electricity – Onroad EV charging – HDV	-	-	-	-	-	-	-	-
Electricity – Onroad residential grid EV charging	622,330	682,099	717,363	835,597	731,067	803,075	880,277	
Electricity – Onroad incremental Low-CI residential EV charging	106,492	123,546	125,458	27,269	26,031	22,334	33,624	
Electricity – Onroad non-residential grid EV charging – LDV/MDV	4,878	4,990	14,875	16,456	10,035	24,601	22,113	
Electricity – Onroad non-residential low-CI EV charging – LDV/MDV	169,417	226,248	243,113	249,189	270,533	290,405	346,218	
Electricity – Onroad non-residential grid EV charging – HDV	1,209	1,599	2,255	4,599	4,639	4,863	6,992	
Electricity – Onroad non-residential low-CI EV charging – HDV	12,699	14,241	14,547	13,906	15,035	16,904	18,919	
Electricity – Offroad fixed guideways	56,387	55,074	69,093	73,779	65,831	70,873	76,653	
Electricity – Offroad eOGV	49,563	95,906	99,127	112,692	97,895	89,774	91,618	
Electricity – Offroad eCHE	17,113	16,404	14,945	14,209	12,713	11,960	14,766	
Electricity – Offroad eForklifts – EDU	-	-	-	-	-	-	-	
Electricity – Offroad eForklifts – Reported	346,091	370,631	385,276	405,177	402,332	407,780	419,490	
Electricity – Offroad eTRU	6,979	9,006	10,164	9,674	8,440	11,129	10,685	
Total	1,393,158	1,599,744	1,696,216	1,762,547	1,644,551	1,753,698	1,921,355	

Another important point is that 29 of the 144 electricity pathways in the electrification category are biomethane related ([source](#)). Plus some of the “Low-CI” charging pathways include biomethane. As argued in Addendum III, this is not a good use of LCFS funds. As noted above, the very large negative CI numbers in these pathways must assume that methane is an unavoidable by-product of dairies, but this is a false assumption.

The calculations below estimate that using:

- Grid electricity to charge cars gives a cost/benefit ratio of \$354/MT.
- Solar plus storage which includes assuming the purchase of an EV has a cost effectiveness of \$109. This is using utility rates from NEM 3.0 (the current CPUC program for rooftop solar). It does not include cost of the chargers.
- Solar plus storage to charge EVs for the general public would cost \$532/MT. And it does not include purchase of an EV with related GHG reductions, as discussed below.

- Solar plus storage to charge DC fast chargers gives an estimated cost/benefit ratio of \$159/MT.

As noted, there are many assumptions in each of these calculations that need to be further developed.

A. Grid Electricity

One of the LCFS pathways, listed [several times in the electricity pathways](#), is described as “California grid electricity used as a transportation fuel in California”.

This use of LCFS funds is

1. Not cost effective
2. Unlikely to be enough to incentivize electric vehicles purchases;
3. Not able to move the state toward its zero emission goals.

Regarding points 2 & 3: Using the state average of 30¢ per kwh, and taking roughly \$1 billion in LCFS electricity credits, that could purchase $\$1 \text{ billion} / 0.30 = 3.3 \text{ TWH}$ from the grid. California produced 203 TWH in 2021, so this would be a 1.6% potential reduction in electricity prices. But such a reduction is unlikely to provide a significant stimulus to electrification.

Cost effectiveness calculation:

Assumptions:

A car gets 2.6 mi/kwh on average

12,000 miles average per year per car

25 miles per gallon

25 lbs of GHGs per gallon (includes drilling, shipping, refining)

Carbon intensity of gasoline is 90 (with ethanol), i.e 90% of CARBOB

Calculations:

$1 \text{ car} \times 12,000 \text{ mi/year} / 25 \text{ mpg} \times 25 \text{ lbs/mi} / 2200 \text{ lbs/MT} \times 0.9 \text{ CI} = 4.9 \text{ MT per ICEV}$

4600 kwh for one car per year (12,000 miles per car/ 2.6 mi/kwh = 4600kwh)

MT saved: $4600 \text{ kwh} \times 210 \text{ g/kwh} / 1,000,000 \text{ g/MT} = 1.0 \text{ MT grid electricity used for charging an EV for one year}$

Therefore an EV on the grid saves 3.9 MT per car per year (same result as Addendum III-A).

Using 30¢ per kwh as an average grid cost: $30¢ \times 4600 \text{ kwh} = \$1,380$.

If LCFS covers this cost, that gives: $\$1,380 / 3.9 \text{ MT} = \text{\$354 per MT}$

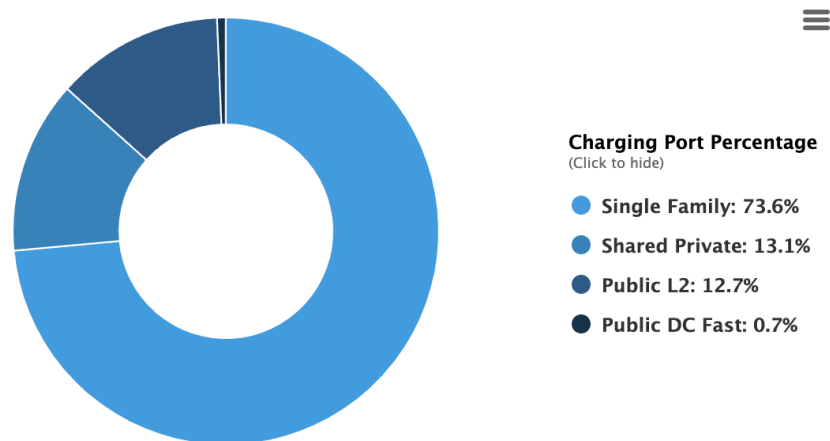
B. Cost effectiveness of supporting solar for EV charging (\$/MT of GHG reduction)

A key issue in this calculation is how much installing a charger can take credit for expanding purchases of EVs. If a charger, say in a home, can be credited with a person buying an EV, then it is appropriate to give credit for the 4.9 MT of GHGs that a ICEV emits per year. This gives a cost effectiveness of \$109 per MT (see calculation below), which is quite good.

Figure 8 below, shows that most charging is private (86.7%) Providing solar plus storage to people who are buying an EV is a good investment, and LCFS should include that in its pathways

Figure 8 – Most Charging is done at home ([Source](#))

To support 28,000,000 plug-in electric vehicles in California you would need:



However, a public charger has a harder time making such a claim. The calculations below estimate \$532 per MT for using solar plus storage to charge EVs.

Assumptions:

\$3.30 per watt for solar. This is an average value for rooftop solar. Utility scale solar is about half the cost of rooftop solar, but it does not receive a 30% federal credit, and it has to cover transmission, distribution and administration charges.

Therefore, the resulting cost/benefit calculation is assumed to be comparable.

2.9kw of solar provides enough kwh for a car for a year: $12,000 \text{ miles} / 2.6 \text{ mi/kwh} = 4,600 \text{ kwh}$; 2.9 kw makes about 4,600 kwh per [pvwatts](#))

7% interest/discount rate

25 years life of solar plus storage
1 kwh = 210 g of GHG in California

4600 kwh needed is provided by storage/365 days/year = 12.6 kwh average per day. I'm estimating 16 kwh for the battery storage, assuming that, in a setting with numerous charging stations, the energy from the batteries could be transferred to cars that need more than average. If more energy is needed than the batteries can provide, this would come from the grid

Storage cost: \$1150/Kwh ([energy sage](#)) [NREL estimates](#) about \$900/kwh for a 6 hour battery for a utility scale project. I'm using the higher cost to be conservative.

80% of solar is self consumed via the batteries (20% export/import from the grid). This is a rough estimate, which takes into account peak cases where imports are needed if numerous cars need more than 16 kwh in a day. The 20% import also accounts for imports which are likely to be needed in short winter days, just as there will be some surplus to be exported in long summer days.

NEM3—pays approx 5¢ per kwh for exports (the CPUC Avoided Cost Calculation)

Capital Recovery Factor (CRF) – 25 years, $i = 7\%$ = .08581

Calculations:

Solar: 2.9kw cost: $\$3.30 \times 2.9 = \$9,600$ less 30% federal tax credit = \$6720

Storage: 16 kwh storage x \$1150/kwh = \$18,400 cost of storage for one car
30% tax credit: $70\% \times \$18,400 = \$12,880$

Cost of solar + storage = $\$6720 + \$12,880 = \$19,600$

Annual equipment cost: $\$19,600 \times .08581 = \1682

Costs due to solar imports and exports:

80% is self-consumed by day use and re-plenishing the charger = $80\% \times 4600 \text{ kwh} = 3,680 \text{ kwh}$

20% is exported at 5¢ per kwh (rough estimate of average avoided costs per CPUC calculations) $20\% \times 4600 \text{ kwh} = 920 \text{ kwh} \times .05 = \46

Since the solar plus storage produces 3,680 kwh, the imports are $4600 - 3680 = 920$ kwh. At a cost of 30¢/kwh this is a cost of \$276

Total cost: $\$1682 - 46 + 276 = \$1,912$

If the grid had been used to charge the car, the annual cost would have been $4600 \times 30¢ = \$1380$. Therefore the extra cost is $\$1,912 - \$1380 = \$532$

Assuming the solar plus storage includes a new EV: This comes to 4.9 MT per year per car as shown here:

1 car x 12,000 mi/year / 25 mpg x 25 lbs/mi / 2200 lbs/MT x 0.9 CI = 4.9 MT per ICEV

Using solar assumes no GHGs from production of the electricity.

Then the cost effectiveness would be $\$532/4.9 = \textbf{\$109 per MT}$.

Without including an EV, the solar panels save 1.0 MT as calculated above in Section IV-A for grid electricity:

$\$532 / 1.0 \text{ MT} = \textbf{\$532 per MT GHG reduced}$

If the LCFS pathway includes paying for a charger:

- 1) If the charger pays for itself via charges on top of electricity rates, then the cost effectiveness remains at **\$109 - 532 per MT**
- 2) If the charger is used by one person and costs \$5,000, and the cost is spread over 25 years at 7% interest, that is $\$5,000 \times .08581 = \429 per year.
Then the cost effectiveness is $(\$532 + \$429)/4.9 = \textbf{\$196/MT}$
Of course this number depends on the assumed cost of the charger, which could be much less for a single family home vs. an apartment.
- 3) If the charger is a public DC fast charger:

This study:

<https://www.sciencedirect.com/science/article/pii/S2213624X23000238> says:
We find that costs can range between \$122,000 and \$440,000 for corridor DCFCs from the sites we studied.

Using \$200,000 as the cost of the charger

Assuming the same 5 people use it per day (this is a wild guess—data would be helpful here), and assuming that they would not have bought an EV without the charger

Each car saves 4.9 MT of GHG per year; so 5 cars save 24.5 MT

$\$200,000 \times (\text{Cap Rec Factor, } i=7\%, n=25 \text{ years}) = .08581 \times \$200,000 = \$17,162/\text{year}$

$\$17,162/5 \text{ cars} = \$3,432 \text{ per car}$

Solar cost + charger cost = $(\$532 + 3432) = \$3,964 \text{ per year}$

$\$3964 \text{ per year} / 24.5 \text{ MT} = \textbf{\$162/MT}$

Discussion of electrification:

The cost effectiveness of supporting solar to charge an EV can be fairly strong if the cost of the charger is low. The cost effectiveness of funding high speed chargers is also not too high, and these are important to eliminate range anxiety by EV buyers.

Fortunately federal infrastructure funds are now available for high speed chargers, so this does would assist LCFS funding.

The conclusion of this section is that using LCFS funds to support solar and EV charging could be a good use of the program's funds. Proposals would need to be evaluated to see how cost effective they are likely to be.



Cuiabá, Mato Grosso, Brazil | May 10, 2024

CARB staff

California Air Resources Board
1001 I ST
Sacramento,
CA 95814

RE: Proposed 2024 LCFS Amendments

Dear CARB staff:

UNEM – Brazilian Corn Ethanol Association welcomes the opportunity to comment on the proposed changes to the Low Carbon Fuel Standard (LCFS). UNEM is the voice of the Brazilian corn ethanol industry, representing more than 90% of national corn ethanol production and 20% of total ethanol production, offering 1.63 billion gallons to the market in the 2023/24 crop year.

In line with CARB's goals highlighted at the LCFS workshop on April 10, 2024, Brazilian corn ethanol from second crops produces a low CI biofuel and is poised to show how its cutting-edge technological advances are making an effective contribution to climate change mitigation.

It is crucial to emphasize that Brazilian corn ethanol encounters a substantial predicament within the LCFS program due to the lack of a regional default value. The prevailing global standard value for corn ethanol in the program fails to encompass the distinctive attributes of Brazil's second crop production, resulting in punitive measures for Brazilian applicants. With this in mind, we call on CARB to reconsider the calculation of the emissions intensity of Brazilian corn ethanol.

To improve the calculation of the Brazilian corn ethanol CI score by the LCFS, we urge CARB staff to consider the following issues:

1. Renewable biomass can be used as a process fuel with a low CI.

060.2 cont.
(see source
comment at
end)

060.1

060.2 cont.

2. New agricultural practices and the introduction of soybean-corn multi-crop systems are solutions to reduce the risk of land use change (LUC) emissions associated with the expansion of bioenergy.
3. Brazil has huge areas of soybean cultivation that can be used to increase the production of corn as a second crop, eliminating the need to acquire additional land.
4. Multiple cropping of corn and soybean carries a low risk of land use change and should be considered in the LCFS/CARB.
5. The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) has recognized that second crops hold zero or negative indirect land use change (ILUC) values. Additionally, CORSIA acknowledges a zero ILUC value for sequential cropping in general, encompassing second crop corn.
6. Negative ILUC impacts for Brazilian corn ethanol have been extensively documented and analyzed in reputable scientific literature.
7. Brazilian corn ethanol is classified as low LUC risk by ISCC/CORSIA.
8. CARB's 2028 Sustainability Certification Program can be improved.

060.3

Use of renewable biomass as a process fuel:

060.1 cont.

Biomass is a renewable and sustainable energy source. The use of renewable biomass for industrial processes offers a compelling solution for tropical countries due to its abundant supply and low environmental impact. As an important component of this LCFS framework, Brazilian corn ethanol producers advocate for the consideration of the use of renewable biomass as a process fuel.

Renewable biomass provides thermal and electrical energy for industry without using fossil fuels for the production process. This is beneficial to produce low-carbon fuels, as this approach reduces greenhouse gas emissions during processing due to the biogenic nature of the carbon burned in the energy-generating boilers.

While other corn ethanol producers elsewhere rely on natural gas or even coal for production, Brazilian ethanol producers are using renewable biomass, such as

eucalyptus, other energy crops and residues. CARB's recognition of the benefits of using renewable biomass to generate energy as part of a low CI ethanol production process is important and will encourage other market participants to move away from fossil sources.

060.1 cont.

Agricultural residues are treated as carbon-neutral, so wood residues should be treated similarly. Woody biomass grown for energy purposes is recognized as neutral by the Intergovernmental Panel on Climate Change (IPCC) because the carbon released during combustion was earlier sequestered from the atmosphere in the plant's growth process. We also emphasize that the biomass sources used by Brazilian second crop ethanol producers are fast-growing species.

The Global Decarbonization plan recently published by the International Energy Agency (IEA) underlines that biomass will inevitably play an important role in the energy transition. This statement by the IEA underscores the importance of CARB analyzing the different types of biomasses as process energy for LCFS pathways and determining the parameters for low CI renewable biomass.

Agricultural practices and multiple cropping systems for soybeans and corn to reduce the risk of LUC:

060.2 cont.

Growing corn as a second crop is a technique in which a second harvest is grown during an additional growing window in the same year. Soybeans and corn are planted in a no-till system without plowing or harrowing the soil. This helps to increase agricultural yields, reduces the risk of land-use change and enables farmers to produce more food and biofuels on the same area of land without having to expand the area under cultivation.

In the Brazilian state of Mato Grosso, where most of the corn ethanol plants are located, almost all corn, about 99%, comes from second crop cultivation. This crop is grown after and on the same area as soybeans. Soybeans are grown in the summer, from September to December/January, and corn is sown immediately after and on soybean residue between January and February, both in no-till.

Agricultural practices and technologies related to corn production have advanced significantly in recent years. Advances in agricultural technology have enabled the introduction of multi-crop production systems, with a focus on cropping models that combine short rotation soybeans and corn as a second crop. These cultivation techniques offer numerous advantages, including higher production per area, better soil protection and optimization of resources in the agricultural production process.

Farmers have adopted a more strategic approach to their farming practices. These include direct farming, a form of regenerative agriculture, crop rotation, the use of high-yielding corn varieties adapted to the region and the development of early soybean varieties adapted to the Brazilian Cerrado (savanna biome), which was important for the development of the second crop.

Precision agriculture has also played an important role in this approach with the introduction of satellite monitoring systems, moisture sensors and drones. This helps to optimize the use of inputs such as fertilizer and irrigation. These practices have proven effective in maximizing the yield of second crop corn and promoting more sustainable and efficient production.

Second crop corn is a decisive factor in improving land efficiency in modern tropical agriculture. Studies have shown that the soybean-corn system can maintain its advantages, especially in terms of soil quality, even under long-term cultivation if good soil management practices are applied. The introduction of direct cultivation in the Brazilian Cerrado region has led to a significant increase in carbon input into the soil, mainly due to the cultivation of a second crop in the same season.

060.2 cont.

3. Brazil has huge areas of soybean cultivation that can be used to increase the production of corn as a second crop, eliminating the need to acquire additional land:

Farmers can expand their corn production without affecting income from other crops. However, they would have to bear the higher risk of a second harvest due to the end of the rainy season or uncertain demand. The corn market is highly responsive to market incentives and can fill existing soybean fields, as has been seen over the past decade. In the Centre-West region, there are 28. million acres of corn acreage, and in the

state of Mato Grosso, 60% of soybean acreage is available for corn expansion. For this reason, corn ethanol production is mainly concentrated in Brazil's Centre-West region, where 97% of corn production is a second crop and 99.5% of corn ethanol is produced.

060.2 cont.

Corn as a second crop has increased its share of the total Brazilian corn area and accounted for around 77 % in the 22/23 harvest. This expansion mainly took place in already established soybean areas. Between 2000/01 and 2022/23, the area under corn cultivation for the second crop in Brazil increased by about 36.3 million acres. However, the area under cultivation for the first corn crop fell by 14.8 million acres in the same period. At the same time, the area under soybeans rose from 34.5 million acres to 108.7 million acres, which corresponds to an increase of 74.1 million acres. The Centre-West region, which accounts for 73% of Brazil's corn second crop production, had a soybean area of 28.4 million acres in 2011/12, which corresponds to the area for corn second crop production in this region in 2022/23.

The expansion of corn second crop production in the Centre-West region was mainly on soybean fields that had already been consolidated for many years. According to the latest data from the Brazilian government, 60% of the soybean area in the Centre-West region is already earmarked for the second crop corn in the 2022/23 season. This means that 40% of the area is still available to produce a second crop.

The expansion of second-crop corn production in the Center-West region occurred mainly in soybean areas that had already been consolidated for many years. According to the latest data from Brazilian Government, the Center-West region has already allocated 60% of the soybean area for second-crop corn in the 2022/23 season. This means that 40% of the area is still available to produce a second crop.

Zero ILUC value for multiple cropping under certain conditions:

060.2 cont.

The U.S. Environmental Protection Agency (EPA) has studied the potential of producing biofuels from camelina and has concluded that it is unlikely to result in significant emissions from indirect land use change if (1) it is expected to be grown on fallow land and (2) it has limited impact on other markets.

According to the EPA, camelina is not currently a popular crop and farmers are unlikely to grow it on a large scale as they could use the land for more valuable crops. However, as growing camelina in rotation can increase the value of the land, it may be used on small areas. Currently, the uses of camelina for non-renewable fuels are limited and there is no significant market for camelina compared to other crops. Therefore, an increase in the production of camelina-based biofuels is not expected to have an impact on the production of other agricultural crops or commodity markets. As a result, the EPA believes that there will be no significant greenhouse gas emissions associated with indirect land use change.

060.2 cont.

Carinata, a winter crop grown in the southeastern United States and South America, is not expected to have a significant impact on LUC emissions. Renewable Energy Group, Inc (REG) conducted an analysis that found no indirect emissions for carinata oil. According to REG, carinata is well suited as a winter crop rotation in Southeast cropping systems because it performs better compared to other oilseed crops and provides soil benefits during the winter months when vegetative cover is required. In the Southeast, carinata is typically grown in the winter months between the seeding and harvest of summer crops such as soybeans, sorghum, peanuts, and cotton. The usual planting schedule is to plant in November and harvest in early May before sowing the next crop.

The cultivation of ethanol from corn in Brazil meets the conditions used by the EPA to determine low ILUC for carinata and camelina, which provides an additional level of confidence for this assessment. Table 1 summarizes the requirements that the EPA established to classify camelina or carinata as low emitting in land use. In the case of camelina, two technical requirements had to be demonstrated in a rulemaking process. Carinata, on the other hand, was approved in a petition process because it was able to demonstrate four technical requirements listed by the EPA as well as ILUC modeling from the CORSIA regulation. Second crop corn in Brazil meets the same technical requirements as camelina and carinata and offers additional safety levels.

Table 1. Comparison between camelina, carinata and corn of the second crop to be considered as low LUC:

		Camelina	Carinata	2 nd crop corn
1	Low impact in other (international) markets	x	x	x

2	Does not generate land displacement of the 1st crop.	x	x	x
3	Do not compete with other winter crops		x	x
4	Low risk of reducing yields of the main crops		x	x
5	ILUC under CORSIA		x	x
6	ILUC based on the FAPRI-CARD model			x
7	ILUC based on the IAM external model			x
8	ILUC based on GTAP/LCFS approach			x
9	Evidence on SOC enhancement			x
10	Rulemaking process	x		
11	Petition Process		x	x

- **Effects of the second crop on the commodity markets:**

Camelina and carinata have a limited commercial use. The oil of these plants is used for cosmetics and to produce biofuels. Camelina meal currently has little market importance and the market for carinata meal is even smaller. But the lack of economic importance does not eliminate the risk of ILUC and makes the future even more volatile. It is not important that the effect of a second crop on the market is zero, but that the risk of significant impact is low. That is the key point.

On the other hand, corn as a second crop is much better understood in this respect. Data and evidence show that corn dynamics in Brazil are largely dominated by the second crop and that shocks in the domestic market have no lasting impact on the global commodity market. Many econometric studies have shown that mainly internal market factors influence the Brazilian corn price and that shocks in the international corn price have a positive effect on the local price, while the opposite has not been proven.

060.2 cont.

A recent econometric study by the University of Campinas confirms this result based on monthly data for the period 2005 to 2022. Various empirical strategies were used, including the estimation of vector autoregressive models (VAR), estimates of

vector autoregressive models with error correction (VEC), cointegration tests, causality tests and estimates of impulse response functions. Through these methodologies, the results confirmed that the corn price in the Center-West region shows a direct reaction to fluctuations in the international price, while the reverse phenomenon is not observed.

060.2 cont.

In contrast, price shocks on the corn market in the state of Mato Grosso do not spread to other countries. Consequently, price changes in the local corn market due to ethanol demand have no impact on the international market and are limited to the second harvest. Understanding the mechanism underlying the functioning of the market allows for better predictability of market movements compared to crops without an established market.

- Second crops for biofuels do not displace the main crop:

060.2 cont.

Carinata and camelina crops do not displace primary crops due to their economic competitiveness, which also applies to corn cultivation. As the data from large-scale production in Centre-West shows, around 100 % of the additional corn comes from the second crop, which leads to an increase in yield and area. It is important to note that the area planted to the first corn crop in Brazil decreased, allowing other crops to expand. As far as the second crop is concerned, no competition for land is expected in the foreseeable future. In Brazil, 108.7 million acres are currently planted to soybeans and only 42 million acres to corn as a second crop, a difference of 27 million acres.

- The cultivation of secondary crops for biofuels does not lead to a reduction in the yield of the main crop:

060.2 cont.

When soybeans are harvested, only small amounts of residue remain, leaving the soil unprotected, which leads to evaporation and leaching of nutrients. This can lead to soil erosion and a loss of organic carbon. However, growing corn after soybeans helps to retain nutrients in the soil, reduce soil erosion and prevent plant diseases and pests.

Factors such as soil cover, carbon input, straw formation on the soil surface and soil organic matter are decisive for the stability and efficiency of the production

system. On the other hand, growing soybeans in monoculture can affect the stability of production, especially in harvests with irregular rainfall. Annual soybeans and corn as a second crop increase total yields per hectare and lead to positive results. Technological advances and regional climatic conditions have enabled early sowing of soybeans, making corn an ideal successor crop.

060.2 cont.

As of 2022/23, the average soybean yield in Brazil is 3.5 t/ha, a significant increase compared to 2.6 t/ha in 2011/12. In the Centre-West region of Brazil, the yield has increased by 25 % within a decade. As shown in Figure 1, the combination of soybeans and corn leads to consistently higher soybean yields over the years.

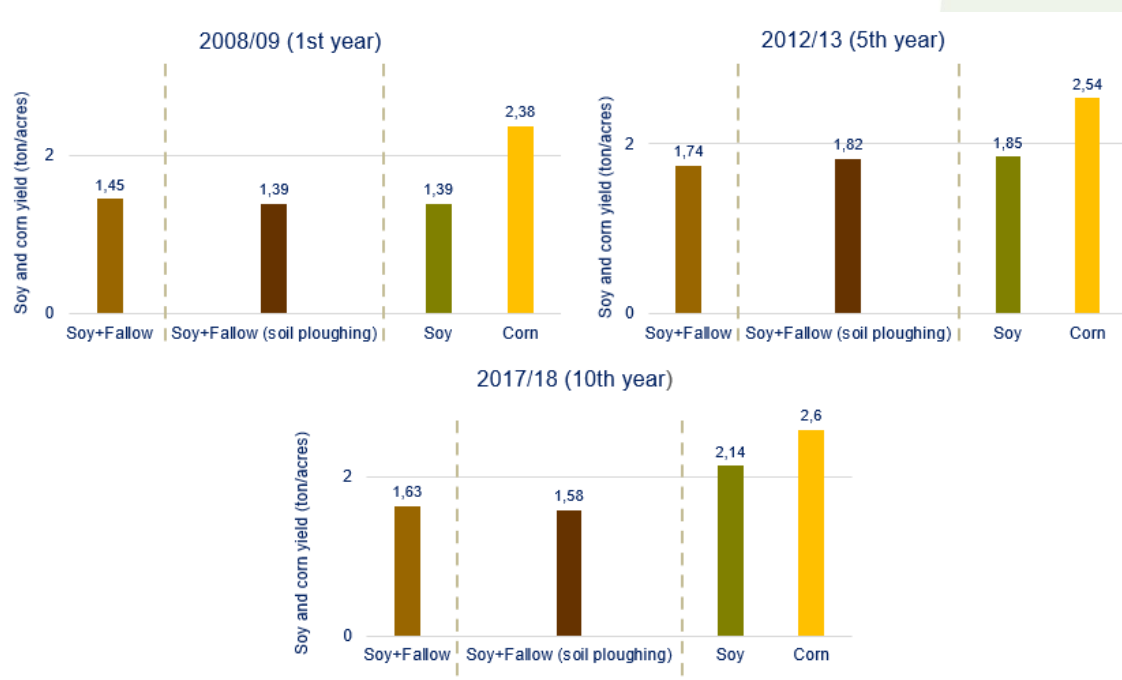


Figure 1. Controlled field trial: soybean in different production systems. Source: MT Foundation (2020).

CORSIA has recognized that second crops hold zero or negative ILUC values:

CORSIA has previously discussed cases of secondary crops such as camelina and carinata that have been given a negative ILUC value because they do not require additional land and have no significant impact on other markets. The negative ILUC for these oilseeds, which are used to produce oil and meal, is since existing feed sources are replaced by the feed portion of the grain used to produce oil and sustainable aviation fuel (SAF).

060.2 cont.

There is currently no final decision from CORSIA on the correct ILUC value for corn in the second crop in Brazil. The standard GTAP-Bio and GLOBIOM models used in this regulation have not been prepared for the analysis of second crops, which already exist on a large scale, which is a singularity of Brazil. In the meantime, CORSIA has determined that “sequential cultivation” (in the case of second crop corn) is suitable for a zero ILUC value under the certification of the low-LUC risk approach, considering the “yield increase approach”. This methodology aims to promote low-LUC risk practices and can be a solution for cases where ILUC models face a major challenge in accurately representing management practices or land use dynamics.

Negative ILUC impacts for Brazilian corn ethanol have been extensively documented and analyzed in reputable scientific literature:

Moreira et al. (2020) developed a consistent life cycle assessment (LCA) for ethanol in Brazil using corn second crop as feedstock. This study was based on the Brazilian Land Use Model (BLUM), a reduced version of the FAPRI-CARD model used in the RFS2 regulation. The study, published in Nature Sustainability, found an ILUC value of -4.7 gCO₂e/MJ for a payback period of 30 years, considering the additional production of 1 billion liters of ethanol from multi-cropping corn by 2030.

060.2 cont.

The negative ILUC value is mainly due to the presence of the second crop in the Center-West region, the use of eucalyptus wood chips in cogeneration and the displacement of conventional animal feed by distiller's dried grains (DDG). The use of second-crop corn was not restricted in the model, and any corn variety (first or second crop) could be selected for ethanol production. The model result showed that most of the additional corn would be grown as a second crop in the Centre-West region of the model (this region has low costs and high supply elasticity). The result already considers

market-mediated effects and could apply to any corn crop in Brazil. This scenario was labeled Scenario 1 (S1).

060.2 cont.

In the paper, simulations of alternative scenarios were conducted to analyze the sensitivity of the results to DDG nutritional efficiency (when displacing forage) and the role of planted eucalyptus forests in ILUC. The results are shown in Figure 2. For scenario S2, which was like S1 but excluded the area expansion for eucalyptus, the ILUC result was 0.4 gCO₂e/MJ. This result shows that the expansion of eucalyptus cultivation contributes to a further reduction in ILUC values. It is important to note that the ILUC value is very close to zero even without taking the eucalyptus expansion into account. For scenario S3, which ran like S1 but assumed a conservative lower nutrient equivalence for DDG, ILUC emissions were -2.6 gCO₂e/MJ. Finally, for scenario S4, which ran like S1 but with a more optimistic assumption of DDG food efficiency, emissions were -7.4 gCO₂e/MJ. The main reason for this decrease in emissions was the reduced cultivation of annual crops and pastures.

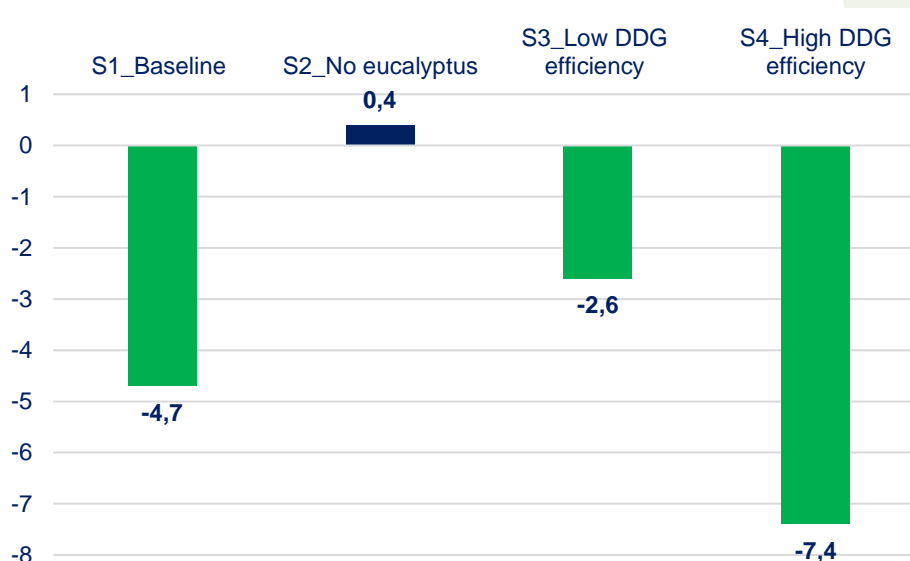


Figure 2. ILUC results for multi-cropping corn ethanol in Brazil (gCO₂e/MJ). Source: Moreira et al. (2020).

Based on the current operating conditions of this application, Scenario 4 appears to be the most suitable option. It involves the use of eucalyptus as the primary fuel source and includes an improved fiber separation technology that increases DDG efficiency. Sensitivity analysis shows that this pathway has low ILUC emissions which

remain stable across a range of potential uncertainties, with emissions ranging from 0.4 to -7.4 gCO₂e/MJ.

Corn as a second crop SAF is characterized by a consistent negative ILUC assessment model (IAM) that explicitly considers multi-crop cultivation in Brazil. Fiorini et al. (2023) estimated the ILUC for SAF in different scenarios using the Brazilian Land Use and Energy System (BLUES) model. The BLUES model is a process-based IAM that uses least-cost optimization and mixed-integer programming to predict long-term outcomes up to 2050 in 5-year intervals.

060.2 cont.

The model includes five macro-regions in Brazil and covers both conventional and new energy and land use technologies. The model was assessed in the latest IPCC report on mitigation strategies (IPCC, 2022). Although the model is not perfectly suited for analyzing RFS, it provides valuable insights. The study analyzes the impact of ILUC for five different commodities, two policy scenarios to combat deforestation in Brazil and five different blending targets for SAF. The results show that corn derived alcohol-to-jet (ATJ) performs best in most cases. Moreover, this was the only pathway that consistently showed negative ILUC values in all scenarios, even when deforestation was not well controlled in Brazil.

Table 2. Cumulative LUC GHG emissions of the assessed scenarios (gCO₂e/MJ) in 2050. Source: Fiorini et al. (2023).

Bio-SAF blends	Maize		Sugarcane		Palm		Macaw low productivity		Macaw high productivity	
	Def	ZeroDef	Def	ZeroDef	Def	ZeroDef	Def	ZeroDef	Def	ZeroDef
10%	-298.0	-286.8	-108.9	-186.9	-169.5	-125.0	-208.0	-170.7	-223.8	-196.8
20%	-74.5	-95.2	-13.7	-107.8	-22.0	-98.8	-3.8	-58.0	7.2	-43.1
30%	-48.9	-53.3	1.0	-36.6	5.4	-31.7	9.2	-34.0	12.5	-24.2
40%	-56.9	-64.0	-5.1	-33.7	3.8	-21.6	15.0	-18.8	10.3	-17.0
50%	-48.4	-37.4	0.2	-23.5	3.8	-13.7	10.4	-4.3	7.9	-13.6

Multiple cropping of corn carries a low risk of land use change and should be considered in the LCFS/CARB:

060.2 cont.

It is widely recognized that ILUC values are not precise and can vary significantly depending on the model and approach. These models can only indicate risk levels and do not provide exact data points. The ILUC value for corn in the second crop

060.2 cont.

can vary between 0.4 g CO₂e/MJ and -298 gCO₂e/MJ depending on the model, premise, and efficiency level. These results differ significantly from the original assessment of regular US corn as defined in the LCFS/CARB. Based on the current analysis, multi-crop corn cultivation can be considered with a low probability of ILUC emissions.

Brazilian corn ethanol is classified as a Low LUC risk by the ISCC/CORSIA:

According to ISCC (2022), when implementing low LUC risk practices to produce SAF, actions that lead to LUC should be avoided. It is important to encourage the production of additional commodities in relation to a baseline without increasing the demand for land.

To obtain certification as low LUC risk under ISCC CORSIA, there are two approaches to commodity production that are categorized as low risk, considering practices introduced after January 2016 (in exceptional cases 2013):

- (i) yield increase.
- (ii) utilization of unused land (degraded land).

The yield of harvested commodities can be enhanced through diverse strategies, including the refinement of agricultural practices, the formation of collaborative partnerships, the practice of sequential cultivation, the mitigation of post-harvest losses, and the implementation of both mechanical and non-mechanical advancements. These measures, as expounded upon by the ISCC (2022), can effectively augment the productivity and quality of agricultural output.

060.2 cont.

One of Brazil's second crop ethanol producers has become the first ethanol producer in the world to receive the international ISCC CORSIA certification with the addition 'low LUC risk'. This certification confirms that the company's production process complies with global standards for the production and supply of ethanol and corn oil for SAF and that Brazilian second crop ethanol is a feedstock that does not cause emissions related to indirect land use change. This approach aims to ensure that the production of biofuels makes a positive contribution to reducing carbon emissions, particularly in hard-to-decarbonize sectors such as aviation.

CARB's 2028 Sustainability Certification Program:

We would like to make the following additional suggestions regarding the requirement that all crop and forest-based feedstocks must be certified by January 1, 2028:

060.3 cont. **Clear guidelines:** Develop clear rules and definitions to ensure that products have the required sustainability attributes to avoid misinterpretation and ensure compliance with stakeholder involvement and learning from existing programs.

060.4 **Focus on fuel value chain:** certification of production that meets the requirements of the LCFS without interfering with other sectors of the local economy and respecting national sovereignty.

- Recognize that raw materials and fuel production may serve multiple sectors with different certification standards.
- Certifications should be limited to the fuel production chain, respect the laws of the individual countries, and avoid interference.
- Certification procedures should be tailored to and focused on the specific sector of the product concerned, while respecting the sovereignty of the countries supplying the raw materials.

060.5 **Avoid market reserves:** Encourage competition and diversity of certifications by establishing comprehensive rules that are compatible with different systems, reducing red tape and providing more options for qualified materials.

- Sustainability certification for LCFS should be a process that encourages continuous improvement and educates a growing number of producers about the benefits of sustainable practices and does not impose restrictive and unnecessary criteria that could monopolize the market by qualifying a limited number of producers or processes.
- There is a risk that sustainability certifications will only apply to certain curtailment schemes. Homogeneousness should be balanced to prevent monopolization of the market.

- CARB should aim to establish comprehensive rules that allow multiple certification programs without being too restrictive, promote competition, expand options for qualified materials, and reduce bureaucracy.
- CARB should conduct a comprehensive evaluation of certification programs, focusing on broad sustainability criteria to include different systems, including regional systems such as Brazil's Renovabio program, if the certification scheme meets the required sustainability criteria of the LCFS or commits to meeting/implementing these criteria.

060.6

Interchangeability of certifications: Allow interchangeability with other certifications that are equally or more stringent to avoid duplication and promote efficiency and compliance with required attributes, such as transparency and traceability. Avoid creating LCFS-exclusive modules in certifications such as ISCC and RSB to minimize complexity and duplication of effort.

- Avoiding linking each market or program to its own certification system avoids duplication of effort, multiple management systems, additional documentation, additional costs, and slow processes.
- Encourage the use of interchangeable certifications that meet equivalent standards to save time and resources.
- The LCFS could expand its certification schemes to include those that are compatible and interchangeable and consistent with its principles and criteria across the supply chain.
- The certifications could be based on strict national environmental laws that prescribe social and ecological responsibility and reflect the standards of the LCFS.
- Ensuring transparency and traceability in the production chain is crucial, especially for proving land use change and ensuring that products meet the required characteristics. Compliance with laws related to non-verified requirements could confirm compliance with the required LCFS attributes.

060.7

Optimize time and reduce costs: Strategies to optimize the time and reduce the costs of implementing and maintaining certifications, improving efficiency and accessibility

using standard values, remote testing, investing in qualified inspectors and training local professionals can mitigate logistical challenges and reduce costs for growers.

- The use of regional default values can streamline certification and monitoring, as less data and documentation is needed than when relying on actual GHG values, which can lead to delays.
- In addition to the required audits by the certification programs, LCFS applicants must also undergo on-site visits by independent auditors to obtain traceable certificates. This requirement can significantly increase both the time and costs of the certification process. Conducting remote audits where possible and investing in qualified auditors and training local professionals, especially in developing regions, could save time and resources.
- Annual fees, volume-based fees and fees per unit of production required by certification programs, together with implementation costs such as infrastructure adjustments on farms, preparation of certificates and staff training and on-site audits, can be prohibitive for all producers, especially small farms.
- Certification costs can drive up the price of biofuels and place a financial burden on producers and the entire supply chain, which can lead to a decline in production and supply volumes due to the high costs and bureaucratic burden.

Scalability: The introduction of regional eligibility criteria and a modular certification approach could simplify the certification process, reduce costs, and promote scalability, as different parts of the production chain can comply with the certification standards independently of each other.

- The introduction of regional eligibility could solve this complexity by seeing specific regional characteristics and streamlining the certification process.
- Enabling random audits using the square root of the number of farms to be certified to shorten the audit time.
- Global scalability must account for potentially prohibitive costs for all producer types, including fees for Certification Bodies, property adaptations, and staff training to meet evolving standards.

- A scalable solution might involve a modular adherence mechanism within the production chain, where certification is independent for different product batches or areas, thereby simplifying management and reducing costs.

060.2

Based on the April 10 presentation, default values will only apply to sites that already have defined pathways, so **we urge that a default value for Brazilian ethanol from second crop corn be included in the rulebook.** In addition, the certification process should be robust and efficient, as different certification processes should not be assessed overlapping and should be easily scalable.

Therefore, we request that CARB to reevaluate the Brazilian case and allow the submission of a new rulemaking process to establish a regional default value that reflects the reality of Brazilian second crop corn.

Respectfully,



**UNEM – Brazilian Corn Ethanol Association
President and Chief Executive Officer**

ATTACHMENT

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May 10, 2024

The Honorable Liane Randolph
Chair, California Air Resources Board
Low Carbon Fuel Standard Program
1001 I Street
Sacramento, CA 95814

RE: April 10, 2024, California Low Carbon Standard Workshop

Dear Chair Randolph and Members of the California Air Resources Board,

DTE Vantage (DTE) appreciates the opportunity to provide the following comments on the April 10, 2024, workshop to discuss the proposed amendments to California's Low Carbon Fuel Standard (LCFS) program. DTE is a developer, owner, and operator of biomass, co-generation, and landfill gas electricity facilities in California and nationally, supplies renewable natural gas (RNG) to the state, and participates in the LCFS program.

Our company has invested millions of dollars in California's decarbonization goals due to the strong market signal provided by the LCFS program. By spurring investment and innovation, the LCFS has been and can continue to be a critical tool for achieving the state's objectives to reduce the carbon intensity of the transportation sector, while continuing to set a leading example for other states and jurisdictions on how to drive performance-based emission reductions in the transportation space.

We appreciate the California Air Resources Board's (CARB) efforts to engage stakeholders and provide the agency's underlying model assumptions and outputs as it considers changes to the LCFS program. We respectfully submit the following comments for your consideration.

Further Increasing the Stringency of the Program Will Accelerate California's Transportation Decarbonization Goals

As DTE and other stakeholders have commented throughout this amendment process, CARB has an opportunity to enhance the market signal to low carbon fuels and drive further greenhouse gas (GHG) emissions reductions by increasing the LCFS program's stringency. DTE strongly supports CARB's efforts to strengthen the program in the 15-day package. We are encouraged by the Agency's recent workshop outlining its intention to increase the 2030 carbon intensity (CI) targets from 20% to 30% by 2030, with a one-time reduction of 5%, 7%, or 9% in 2025. However, we urge the Agency to consider even more stringent reduction goals to support California's ambitious climate targets and address the current LCFS market imbalance.

Time is of the essence when considering implementation of the new LCFS amendments; we strongly urge CARB to stay on pace for a late 2024 or early 2025 implementation. DTE Vantage's internal modeling suggests that the currently proposed changes to the LCFS program are not sufficient to address the growing credit bank. In fact, we predict that the credit bank could increase to over 80MM credits by 2030 absent additional changes to the latest proposed rules. Failing to curb the growing credit bank could undermine necessary investments in low carbon fuels and unwind the clean fuels market needed for California to meet its climate goals. If the credit bank swells to 2x to 4x its current size, credit pricing may decrease to the point that further decarbonization investments are no longer incentivized and existing projects may be forced to shut down for economic reasons. Our recommended actions, discussed further below, will establish a more robust LCFS program that will continue to drive innovation and accelerate GHG emissions reductions.

061.1 To CARB's credit, the LCFS program is highly successful and has overperformed in recent years, creating greater reductions than required and leading to a significant oversupply of credits. We anticipate the rate of credit generation will continue to grow in the near and medium term, driven by large renewable diesel refinery conversions and an increasing adoption of electric light-duty vehicles. The cumulative LCFS credit bank now stands at ~23.6 million surplus credits, while LCFS prices continue to decline, hovering around \$60 per ton in April 2024. **We encourage CARB to target at least a 40% CI reduction by 2030 to address the credit surplus.**

061.2 Additionally, due to the size of the current credit bank and the ongoing credit surpluses, we believe that CARB's proposed 5% step-down in 2025, while helpful, is unlikely to impact the market at the scale needed. A decisive step-change reduction in 2025 would provide a signal of strong intent by the Agency to support both short- and long-term investment to meet California's climate goals. CARB introduced modeling scenarios of 7% and 9% step-downs in the latest workshop, and **DTE encourages the Agency to consider increasing the step-down provision's size to at least 9% to appropriately address the current state of credit and deficit creation.**

061.3 Finally, we applaud CARB's proposal to integrate an auto-acceleration mechanism to increase the stringency of the annual CI targets of the program when triggered by clear criteria. However, like our recommendations above regarding the CI reduction target and the step-down mechanism, we encourage CARB to be more ambitious in its proposal to ensure the greatest progress in achieving the goals of the LCFS. **We recommend the agency adopt the auto-acceleration mechanism earlier, as soon as 2025, to allow triggering as early as 2026 and ensure the current surplus is addressed promptly and efficiently.** While there is no rationale for delaying the implementation of the acceleration mechanism given its triggering criteria, there is substantial risk in further growth of the credit bank if adoption of the mechanism is delayed.

061.4 **CARB's Proposed Remedy of a 4x Penalty for CI Exceedance is Excessive and will Disproportionately Impact Agriculture Facilities**

DTE Vantage incorporates by reference the comments submitted by the RNG Coalition dated February 20, 2024, which reflect our stance on CARB’s proposed penalty for CI exceedance.

“We continue to support a full true up to verified actual CI performance for all pathways (temporary, provisional, and fully certified). Dairy Manure Digesters (and other biological systems) experience substantial increases and decreases in gas production due to weather, livestock herd changes, and other uncontrollable factors that are not present in other fuel pathways. Because the carbon intensity of the gas from these systems is calculated against a quantity of avoided methane emissions, these variations in biogas production necessarily result in outsized changes in the digester pathways’ carbon intensity (CI) scores every year. Under the current structure of the LCFS (prior to the changes proposed in this rulemaking), all dairy digesters pathways experience the following negative impacts:

1. Substantial underestimation of greenhouse gas benefit (and associated lost revenue) during the project startup (temporary pathway) period.
2. Substantial risk of underestimation of greenhouse gas benefit (and lost revenue) each year during annual verification.
3. Substantial risk of LCFS enforcement, resulting in fines or potential pathway cancellation, due to no fault of the pathway holder.

These consequences are an unavoidable outcome of CARB’s overly conservative approach to dairy digester pathways (and some other pathways with biological feedstocks) under the current LCFS structure. As we will describe below, no amount of careful management, conservative pathway assumptions, or other actions can fully protect a digester under the Current Rule—and the Proposed Rule’s changes alleviate some, but not all, of these concerns.”¹

DTE Vantage understands CARB’s focus on program integrity and the importance of recouping excess credits created by CI scores, adjusted during reviews. However, imposing a 4x penalty for adjustments not resulting from misconduct is unwarranted and unfair. DTE agrees with a party refunding excess credits received (despite the fact that CARB does not award additional credits when a review finds that a lower CI score was warranted) but opposes the 4x penalty. This punitive provision is not justified by any history of problems with the program, and the existing documentation and 3rd party review requirements already provide adequate protection for the program. **DTE strongly encourages CARB to eliminate this multiplier penalty. Conversely, providing a true up mechanism whereby excess credits are refunded back to CARB and additional credits are awarded following a review showing that a lower CI score was warranted would be an acceptable solution to the inherent variability in dairy manure digester pathways.** DTE Vantage agrees with the system proposed by the Coalition for Renewable Natural Gas’ comment letter dated 2/20/2024.

Conclusion

¹ RNG Coalition’s Comments on Low Carbon Fuel Standard Initial Statement of Reasons dated 2/20/2024

In summary, DTE Vantage appreciates the opportunity to provide the agency with these comments and commends CARB for its efforts and dedication to this program and amendment process. As the Agency looks to finalize this rulemaking, we strongly encourage CARB to implement the following changes:

- At least a 40% CI reduction target in 2030,
- Increase the step-down provision by at least 9% in 2025,
- Effectuate the auto-acceleration mechanism in 2025, and
- Implement symmetrical CI true up mechanism for pathways known to have inherent variability.

We would welcome the opportunity to meet with the agency should there be any questions regarding our recommendations. Thank you for your consideration of our comments.

Sincerely,

A handwritten signature in black ink, appearing to read "Philip O'Neil". The signature is written in a cursive, slightly stylized font.

Philip O'Neil

Vice President – DTE Vantage

May 10, 2024

Clerks' Office
California Air Resources Board
1001 I Street
Sacramento, California 95814

Re: Opposition to California Air Resources Board Proposal to Regulate Jet Fuel

Dear Chair Randolph,

062.1

In response to the workshop held April 10th, 2024, we are writing to share and restate our serious concern and opposition to the recent California Air Resources Board (CARB) proposal to regulate jet fuel under its Low Carb Fuel Standard (LCFS) Program. We believe the CARB proposal will raise the cost of conventional jet fuel without inducing additional Sustainable Aviation Fuels (SAF) production or use in California, an objective the aviation industry shares with CARB. And further, the proposal to regulate jet fuel is pre-empted by federal authority. We encourage CARB to withdraw the proposal to regulate jet fuel and instead establish a joint CARB-industry working group to explore alternative solutions to increase SAF production and use.

American Airlines is committed to reducing its climate impact and achieving net zero carbon emissions by 2050, and transitioning to SAF is core to this commitment. We have long recognized that scaling up the supply of SAF and achieving net-zero carbon emissions by 2050 can only happen by working collaboratively with governments and other stakeholders across sectors. Achieving this ambition for SAF will require new and additional policy incentives, streamlined permitting processes, and close collaboration among governments, the aviation industry, the fuels industry, environmental organizations, and others.

Aviation accounts for 2.6% of the U.S. greenhouse gas emissions but 5% of U.S. Gross Domestic Product (GDP) and 4.1% of California's GDP, thus exerting outsize economic impact relative to its share of emissions. U.S. civil aviation firms employ more than 380,000 California-based employees, with an overall economic impact of \$194 billion.¹ Aviation is critical to driving California's economy and its rank as the 5th largest economy in the world, enabling \$114 billion in annual trade flows and underpinning many of California's other significant economic drivers such as agriculture, tourism, manufacturing, banking, technology, and small business.

California has established itself as an early leader in attracting investment, production, and use of SAF through the existing LCFS Program, which provides an opt-in credit for SAF that helps reduce the price difference between SAF and conventional jet fuel. Ensuring a healthy and vibrant aviation industry is essential to California's future, and leveraging CARB's early leadership on SAF can enable California leadership in the emerging SAF production industry, creating new jobs and economic development opportunities.

¹ [The Economic Impact of Civil Aviation on the U.S. Economy, State Supplement, US Department of Transportation, November 2020](#)

In its April 10th, 2024 workshop, CARB re-stated that a principle objective of its regulatory proposal is to “Increase the use of alternative jet fuel in the State”. We share that objective as reflected in our company commitment to American Airlines and our US airline industry support for the US government SAF Grand Challenge. American Airlines and our fellow airlines have clearly demonstrated a strong, enduring market signal for affordable SAF. The challenge remains supply of affordable SAF, not the absence of a market signal by airlines.

With this context, we express our serious concern with the proposal by CARB to regulate jet fuel used for flights within California as an obligated fuel under the LCFS Program. The proposal to eliminate the exemption for jet fuel used on intrastate flights would not result in significantly increased SAF production, availability, or use in California, but would lead to higher jet fuel prices and slow down, rather than accelerate, efforts to increase the state’s SAF production and use. The primary impediment to increased SAF production and availability in California remains the higher cost of SAF for producers and buyers relative to conventional jet fuel and renewable diesel. Whether or not jet fuel becomes a deficit generating fuel has no direct impact on whether SAF is produced or used. As the proposal does not provide a mechanism to reduce the economic disadvantage of alternative jet fuel, it will have no material impact on the availability or use of alternative jet fuel in California.

In addition to not being an effective policy tool to increase SAF production, the proposal seeks to regulate jet fuel and reduce emissions from aviation, both of which are preempted under federal law, a fact that CARB recognized when it exempted jet fuel from the LCFS in 2018.² Aviation, unlike many other industries, is uniquely situated in that other factors such as the safe operation and maintenance of aircraft are of great importance, which the federal government has recognized in the jurisdiction of the FAA and the EPA’s Clean Air Act.

Our mutual interest is to increase SAF production, availability, and use, and the most effective way to accomplish this is to continue the positive, collaborative approach represented by the existing “opt-in” mechanism developed by CARB and the aviation community. Only actual SAF use – not merely the creation of jet fuel deficits – will provide the benefits of SAF desired by CARB, airport communities, SAF producers, and airlines. We urge CARB to reconsider and withdraw the proposal to remove the exemption for jet fuel for intrastate flights, preserve the existing opt-in approach for SAF, and establish a joint CARB-industry working group with stakeholders across the emerging SAF ecosystem to explore alternative policy and voluntary proposals to rapidly increase SAF production, availability and use in California. We look forward to working with CARB on such measures to accelerate SAF deployment.

Yours truly,

Eduardo A. Angeles
Director, State & Local Government Affairs

² CARB stated that “[s]ubjecting aircraft fuels to annual carbon intensity standards would raise federal preemption issues” available at https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2018/lcfs18/isor.pdf?_ga=2.259407882.120243749.0.1641231788-253234234.1573227006



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May 10, 2024

Clerk of the Board
California Air Resources Board
P.O. Box 2815
Sacramento, CA 95812

Submitted electronically via: <https://ww2.arb.ca.gov/public-comments/low-carbon-fuel-standard-workshop-april-10-2024>

RE: POET COMMENTS ON APRIL 10, 2024 LCFS RULEMAKING WORKSHOP

Dear CARB Board Members:

POET appreciates the opportunity to provide comments on the recent workshop held to discuss potential refinements to the California Air Resources Board's ("CARB") December 2023 Proposed Low Carbon Fuel Standard ("LCFS") Amendments ("Proposed Amendments"). POET has participated actively in CARB's ongoing rulemaking and submitted detailed [comments](#) on February 20, 2024 regarding the Proposed Amendments. We write now to offer feedback specific to the matters discussed and presented during the April 10, 2024 workshop.

Our continuing concerns with CARB's Proposed Amendments principally relate to the proposed sustainability requirements for crop-based and forestry-based feedstocks. We appreciate CARB's willingness to share more details regarding these proposed requirements during the April 10, 2024 workshop. Unfortunately, the proposed program features that CARB shared in further detail confirm and deepen the concerns we raised in our February 20 comment letter.

Specifically, we remain concerned that the proposed sustainability requirements (1) fail to distinguish between low-risk domestic feedstocks like corn and higher risk oil-based feedstocks that are actually driving policy concerns; (2) ignore sustainability guardrails already in place for American-grown corn starch ethanol; (3) attempt to regulate social and other non-climate related factors that lie outside the ambit of AB 32; (4) wrongfully delegate to the European Union and other third parties the responsibility to establish and certify conformance with sustainability standards; (5) impose costs on bioethanol production that will restrict the supply of bioethanol to the California market and raise gasoline prices.

POET urges CARB to reconsider and abandon its proposal to impose further sustainability requirements on corn starch ethanol. In the alternative, POET urges CARB to re-evaluate its proposed approach to sustainability requirements and as part of a future rulemaking, and consider crediting for climate smart agricultural practices as a policy to encourage sustainability.

I. CARB's Proposed Sustainability Requirements are Unnecessary As Applied to Corn Starch Ethanol

063.1 As discussed in our written comments submitted on February 20, California has already implemented safeguards that address perceived concerns regarding the potential land use consequences of domestic corn ethanol production. Indeed, California's GREET model imposes an indirect land use change ("ILUC") penalty of 19.8 g/MJ, which is among the highest such penalties imposed in U.S. biofuels programs, and higher than ILUC values reflected in studies conducted since 2015 when California adopted its policy.¹ As POET has commented previously, we believe this ILUC penalty overestimates the land use impacts of domestic corn production. In all events, it is unclear what further perceived environmental harms, if any, would be addressed by additional regulations on domestic corn production as part of the LCFS.

063.2 Rather, as Canada's Environment and Climate Change agency ("ECCC") has determined as part of its newly adopted Clean Fuel Regulations, corn production in the United States is already subject to rigorous state and federal environmental laws addressing impacts to air, water, land use and wildlife. For this reason, ECCC has exempted certain U.S. grown crops, including corn, from compliance with additional land use and biodiversity criteria that is otherwise imposed on crop based feedstocks. *See* Clean Fuel Regulations, SOR/2022-140 §§ 53(1), 55(1).² To the extent that CARB continues to believe sustainability requirements are necessary to control for the perceived environmental impacts of certain crop and forestry-based feedstocks, POET urges CARB to adopt Canada's approach to corn starch ethanol, which is well regulated by existing law.

II. The Policy Considerations Apparently Driving CARB's Proposed Sustainability Requirements are Focused on Perceived Effects of Increased Oil-Based Crop Production

The stakeholder feedback that appears to be driving CARB's policy approach is focused on oil based feedstocks. For example, during the workshop on April 10, CARB's presentation devoted several slides to the concerns underlying the proposed sustainability requirements. *See* California Air Resources Board, *California Low Carbon Fuel Standard Workshop*, (April 10, 2024), <https://ww2.arb.ca.gov/sites/default/files/2024-04/LCFS%20April%20Workshop%20Slides.pdf> ("CARB April 10 Workshop"). Each of these slides focused on matters concerning biodiesel, renewable diesel and the oil-based feedstocks necessary to sustain production of these fuel types.

For example, Slide 52 raised the following topics for discussion: "How has crop-based oil seed demand and production changed as biomass-based diesel (BBD) volumes increased?; Does

¹ Notably, the United States Department of Treasury recently adopted a GREET model for purposes of determining qualifying feedstocks for sustainable aviation fuel (SAF) production tax credits. *See* U.S. Department of Treasury, Notice 2024-37, §§ 40B SAF Credit Guidance (April 30, 2024) available at <https://www.irs.gov/pub/irs-drop/n-24-37.pdf>. That model assigned an ILUC penalty of 9.0 CO₂eg/MJ for corn starch ethanol-to-jet-fuel pathways and a total indirect effects penalty of 11.1 CO₂eg/MJ for corn starch based SAF. *See* U.S. Department of Energy Guidelines to Determine LCA using 40BSAF-GREET 2024 at p. 19, Table 3b.

² As discussed in our previous comment, Canada's version of the GREET model also does not impose an ILUC penalty on corn starch ethanol for purposes of calculating the carbon intensity (CI) of fuels participating in the CFR. *See* Canada's Fuel Lifecycle Assessment Model available at <https://www.canada.ca/en/environment-climate-change/services/managing-pollution/fuel-life-cycle-assessment-model.html>.

evidence show that BBD production is increasing cropbased oilseed demand and/or prices?; Is the increase in BBD production resulting in deforestation and/or food system impacts?” *See id.* (Slide 52). Slide 53 focused on trends in biomass based diesel production, noting increases in oil based feedstocks. *Id.* (Slide 53). Slide 54 noted trends in “crop-based oil prices.” *Id.* (Slide 54). Slides 55-56 noted trends in domestic and foreign soy-oil markets. *Id.* (Slides 55-56); Slide 57 summarized the several preceding slides. CARB noted that “biomass-based diesel volumes [are] increasing and likely to increase in the future, given announced capacities” but that “it is uncertain if substantial increases in virgin oil fuel use in California will occur over long-term.” *Id.* (Slide 57). CARB concluded that “guardrails [are] still warranted to reduce risks of potential impacts from increased demand of virgin oils in CA LCFS.” *Id.*

Nowhere in this presentation was corn starch ethanol mentioned as a feedstock of concern that would warrant the imposition of further “guardrails.” Nor was corn ethanol mentioned during the workshop’s public comment period as a feedstock that presented the types of concerns animating CARB’s proposed sustainability requirements. In short, CARB’s proposed sustainability certification program is apparently aimed at solving problems that have not been identified with respect to corn starch ethanol.

063.3

Despite corn starch ethanol being absent from CARB’s discussion of feedstocks of concern, the proposed rule’s broad-brush approach treats non compliance by any feedstock, including feedstocks that displace gasoline, by assigning a diesel fuel CI that would result in ethanol having a higher CI than gasoline. POET urges CARB to tailor its proposed policy in a manner that appropriately distinguishes among feedstocks and to refrain from imposing unnecessary and punitive restrictions on corn starch ethanol.

III. The Complexity and Burden of CARB’s Proposed Certifications Will Restrict the Supply of Ethanol to California and Raise the Cost of Gasoline

As POET explained in its written comments submitted on February 20, obtaining sustainability certifications under the proposed rules is likely to be burdensome and costly. CARB’s presentation on April 10 ratified this concern. During the workshop, CARB explained that it “would leverage existing certification programs” such as “ISCC, RBS, REDcert, Bonsucro, etc. (Most already approved under EU Renewable Energy Directive).” CARB April 10 Workshop (Slide 60). CARB elaborated that these certifications would require auditors “perform site visits” to farms during which they would confirm the history of agricultural use on the farm, ensure that “cropping practices” meet as-yet-undefined “sustainability requirements,” “review management systems,” “review social practices (e.g., worker treatment),” “review compliance with all applicable regional, national laws and international laws,” and “review economic sustainability of the farm.” *Id.* (Slide 63).

063.4

Although some farmers in the United States currently participate in certification programs that require some level of on-farm auditing and are paid a premium to do so, this level of scrutiny and regulatory burden is unknown to the vast majority of American corn farmers, who would likely have to make costly changes in their operations to meet the requirements of an audit. Many farmers would likely refuse to participate in such a program, and those who might choose to do so would demand premiums that could translate to an increase of several cents per gallon in gasoline prices.

Moreover, as POET explained in its February 20 comment, it is not even clear that there are enough qualified certification bodies available to certify the corn supply chain in America by 2028, let alone the supply chains of all other crop-based fuels subject to the proposed sustainability requirements. Completing a multidimensional audit of every LCFS-participating farm by the beginning of 2028 is a complex and likely infeasible task, the consequences of which CARB does not appear to have acknowledged in its rulemaking record. Realistically, significant volumes of crops would not be certified by 2028 even though such sites satisfied whatever substantive sustainability criteria CARB may choose to adopt, resulting in ethanol being treated as a deficit-generating fuel regardless of efforts to comply with the proposed sustainability requirements.

Although POET and other stakeholders previously explained the burdens associated with the proposed certifications, CARB still has not presented any evidence that it has modeled or studied the costs and consequences associated with its proposed certification, nor did it discuss or address any of these challenges during the April 10 workshop.

IV. CARB’s Proposal also Suffers Legal Infirmities

A. CARB’s Proposal Unlawfully Delegates Substantive Policymaking to the European Union and Third Party Certification Bodies

The April 10 Workshop confirmed that CARB intends to rely upon ISCC-type certifications that were created to ensure compliance with EU’s RED standard. *See* CARB April 10 Workshop (Slide 60) (“CARB would leverage existing certification programs” such as “ISCC, RBS, REDcert, Bonsucro, etc. (Most already approved under EU Renewable Energy Directive).”). In other words, it appears CARB intends to abdicate its role in adopting substantive sustainability criteria and to incorporate into California law standards established by the EU and third party non-governmental organizations. As POET explained in its February 20 comment, this is prohibited under California’s non-delegation doctrine.³

B. CARB’s Proposal to Incorporate Employment Law and Other Non-Climate Related Criteria into the LCFS Regulations Exceeds the Scope of the Agency’s Rulemaking Authority Under AB 32

AB 32,⁴ the authorizing legislation for the LCFS Program, directs CARB to adopt market-based measures to achieve the GHG reduction goals of the law.⁵ The law does not, however, authorize CARB to establish criteria for participation in the program that are aimed at achieving policy goals outside the ambit of AB 32’s climate-related goals. During the April 10 Workshop, CARB showed slides indicating that the agency apparently intends to regulate the “social practices,” “management systems,” and “economic sustainability” of farms whose crops are sourced as low carbon fuel feedstocks. *See* CARB April 10 Workshop (Slide 63). This type of regulation is ultra vires under AB 32.

³ *Monsanto Co. v. Office of Environmental Health Hazard Assessment*, 22 Cal. App. 5th 534, 556 (5th Dist. 2018) (citing *International Assn. of Plumbing etc. Officials*, 55 Cal.App.4th 251, 254 (3rd Dist. 1997) (holding that legislation violated the nondelegation doctrine when it delegated regulatory determinations to individuals)).

⁴ California Global Warming Solutions Act, Cal. Health & Safety Code § 38500-38599.

⁵ Cal. Health & Safety Code § 38570.

V. CARB Should Consider An Incentive Based Approach to Sustainability

063.8

CARB's proposed sustainability requirements present an all-or-nothing mandate for crop-based feedstocks to conform to certain as-yet-undefined standards of sustainability. As discussed above and in our prior comments, POET believes this approach is misguided, and will lead to the unintended consequence of excluding low carbon biofuels and their associated climate and public health benefits from the California market.

063.9

As POET has observed in its frequent engagements with CARB over the last several years, agricultural sustainability could be better achieved through clean fuels programming that provides incentives for farmers to adopt climate smart agricultural practices—an approach recently undertaken by the U.S. Treasury Department in its implementation of the Inflation Reduction Act. See U.S. Department of Treasury, Notice 2024-37, §§ 40B SAF Credit Guidance (April 30, 2024) available at <https://www.irs.gov/pub/irs-drop/n-24-37.pdf>.

063.10

Treasury's recently adopted guidance, aimed at incentivizing the production of sustainable aviation fuel, recognizes that no-till farming, planting cover crops, and applying enhanced efficiency nitrogen fertilizer are all climate smart agricultural practices that help reduce CI for crop-based feedstocks such as corn. *Id.* CARB should consider following the Biden Administration's lead in promoting agricultural sustainability through economic incentives rather than adopting mandates that may undermine CARB's climate goals and lead to unpredictable and unfavorable fuel market consequences.

VI. CARB Should Approve E15 for Sale in California

063.11

POET appreciates and agrees with CARB's acknowledgement for the "[p]otential role of E15 to reduce costs at the pump." See CARB April 10 Workshop (Slide 66). As California public university research shows, E15 also offers significant climate and public health benefits. Indeed, shifting from E10 to E15 in California would cut annual GHG emissions by approximately 1.8 million metric tons. For these reasons, POET continues to urge CARB to approve E15 for use in California.

CONCLUSION

POET appreciates the opportunity to comment and looks forward to working with CARB to make the LCFS a continued success for California. If you have any questions, please contact me at Josh.Wilson@POET.com or (202)756-5612.

Sincerely,



Joshua P. Wilson
Senior Regulatory Counsel

1200 Smith Street, Suite 730
Houston, TX 77002

California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Comments on Proposed LCFS Amendments to Sections 95481, 95482, 95483, 95483.2, 95483.3, 95484, 95485, 95486, 95487, 95486.1, 95486.2, 95488, 95488.1, 95488.2, 95488.3, 95488.5, 95488.6, 95488.7, 95488.8, 95488.9, 95488.10, 95489, 95490, 95491, 95491.1, 95495, 95500, 95501, 95502, 95503 of title 17, California Code of Regulations

Ladies and Gentlemen:

I am writing on behalf of TES US Development LLC (“TES”) to share our company’s perspective on key aspects of the Proposed Amendments to the Low Carbon Fuel Standard (“LCFS”) regulation relevant to electrofuels (e-fuels) producers. TES respectfully requests the California Air Resources Board (“CARB”) consider the following topics in the LCFS update, to advance California’s transition to cleaner transportation fuels and in furtherance of California’s climate goals:

1) Definition of Biomethane and Synthetic Natural Gas:

064.1

The current and proposed amendments to the LCFS regulation do not clearly define biomethane or renewable natural gas, specifically what CARB considers “synthetic natural gas derived from renewable resources” and whether synthetic natural gas derived from renewable resources of non-biogenic origin (e.g., industrial waste stream or captured CO₂) would be considered biomethane or renewable natural gas. The promotion of recycled carbon fuels is a key contributor towards energy diversification and decarbonization of the transportation sector, especially for drop-in fuels that can significantly reduce emissions in the near future with existing fleet and infrastructure. In addition, such fuels contribute to the recycling of CO₂ emitted to the atmosphere due to the use of waste streams of non-biogenic origin which are unavoidable and an unintentional consequence of industrial processes.

064.1 cont.

The current and proposed amendments to the LCFS define Biomethane as “methane derived from biogas, or synthetic natural gas derived from renewable resources” but do not define “renewable resources.” The proposed LCFS amendment also includes a new definition for Renewable Natural Gas, defined as “an alternate term for biomethane,” so for the purposes of commenting, we will refer to the term biomethane.

TES recommends that LCFS include a standalone definition for “renewable resources” to clearly define the feedstocks that are allowed in low carbon fuel pathways and extend the scope to include a broader range of sources beyond the traditional “biogenic sources,” in accordance with established federal and international practices. As an example, the United States Department of Energy (“DOE”) Office of Energy Efficiency & Renewable Energy defines renewable carbon resources as “*carbon-based resources that are regularly regenerated, either via photosynthesis (e.g., plants and algae), or through regular generation of carbon-based waste (e.g., the non-recycled portion of municipal solid waste, biosolids, sludges, plastics, and CO₂ and industrial waste gases).*” Also, the recently approved Green Hydrogen Standard defines eligible sources of CO₂ to include “*biomass, biomass waste, and/or bioenergy, direct air capture, unavoidable industrial emissions, or emissions that have paid*

comprehensive compensation through a credible carbon price.” TES recommends expanding LCFS to adopt a similar approach towards the applicability of synthetic natural gas and other e-fuels.

064.2

TES would like to highlight the state, federal, and international level recognition of the importance of carbon capture, utilization, and storage (“CCUS”) strategies in achieving climate goals and urges CARB to consider how limiting “renewable resources” to biogenic sources would exclude leveraging existing industrial waste streams via carbon capture to produce low carbon fuels.

2) Book-and-Claim

064.3

TES recommends CARB expand the pathways that can apply book-and-claim accounting (“B&C”), which currently includes low-CI electricity, biomethane or low-CI hydrogen, to include any low-CI methane pathways. The current and proposed LCFS only allows B&C accounting to biomethane based on feedstock rather than physical product characteristics or CI. Given the overarching intent of LCFS to support California’s transition to low carbon fuels and drive GHG emissions reductions, TES recommends CARB consider expanding B&C to be feedstock agnostic and focus eligibility based on fuel product (e.g., electricity, biomethane, or hydrogen pathways, where infrastructure exists to support indirect accounting, and use depends upon common carrier infrastructure) and pathway CI.

3) Availability of Fuel Pathways

064.4

TES would like to note that the current LCFS regulation does not include any Tier 1 or Temporary fuel pathways specific to synthetic natural gas or other e-fuels with CO₂ conversion. TES recommends CARB develop either a Temporary or Tier 1 pathway for synthetic fuels or e-fuels that convert CO₂ to common products (e.g., methane, methanol, liquid hydrocarbon fuels). This would help support technology developers and fuel producers to bring these low-CI, drop-in fuels to market, thereby accelerating California’s transition away from fossil fuels while minimizing overall cost of infrastructure development.

We appreciate your review and consideration of our recommendations, and we are ready to provide assistance as needed to support the development of e-fuels and the decarbonization of the transportation sector.

Sincerely,

Cynthia Walker
President
TES US Development



May 9, 2024

Re: Comments on the April 10, 2024 Workshop on proposed LCFS amendments and rulemaking

Submitted electronically: <https://ww2.arb.ca.gov/public-comments/low-carbon-fuel-standard-workshop-april-10-2024>

California Air Resources Board,

Thank you for the opportunity to comment on the April 10, 2024 workshop and related proposed changes to the Low Carbon Fuel Standard. Crimson Renewable Energy greatly appreciates the efforts of CARB staff and engagement with stakeholders in moving forward to meet GHG reduction goals.

Crimson Renewable Energy ("Crimson") operates the largest biodiesel production facility in California, creating ultra-low carbon biodiesel to fuel California communities with cleaner burning, climate friendly fuel. We have been a stakeholder in the LCFS since the beginning of the regulation and appreciate and support the efforts of CARB staff in moving toward a cleaner, low carbon energy future.

Support for More Stringent CI Targets and Changes to Auto Acceleration Mechanism

As climate change accelerates and we approach irreversible (or at least increasingly difficult to reverse) adverse effects, near-term reductions in GHG emissions are more valuable than GHG emissions reductions 20 years or even 10 years in the future. When looking at the consecutive quarter-on-quarter growth in the quantity of positive net credit generation over the past 2 years, alternative fuel suppliers have clearly demonstrated their ability to provide increasingly greater carbon reductions than what the LCFS program has called for thus far. For these reasons, the LCFS program needs to be significantly more aggressive in setting carbon reduction targets to keep pace with the growing availability of lower carbon alternative fuels, and to send the right market signals to both preserve existing low carbon fuel production and infrastructure investments and simultaneously encourage continued investment in the growth of low carbon transportation fuels and related infrastructure.

The 5% and 7% step-down scenarios shown in the April 10 workshop are insufficient to balance the market in the near term and address the very large balance in the credit bank, and would require the Auto Acceleration Mechanism ("AAM") to trigger in order to address these imbalances. This would result in an unnecessary delay in correcting the significant imbalance in the existing credit bank and in ongoing quarterly growth in net credit generation. **Unless the AAM could be invoked in 2025 with the accelerated carbon reduction targets taking effect in Q1 2026 combined with a 7% step down, Crimson supports the more stringent CI target of 30% by 2030 with a 9% step down in 2025 rather than the 5% step down proposed in the December 2023 Initial Statement of Reason ("ISOR").**

May 9, 2024

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Absent a 9% stepdown in 2025, Crimson urges CARB to implement a 7% stepdown in 2025 combined with adjusting the AAM such that (i) it can triggered as early as Q2 2025 based on either 2024 or trailing 12-month LCFS quarterly reporting data, and (ii) the time frame for carbon reduction compliance acceleration to take effect would be as early as feasible, not in the next year. For example, it could take effect in the compliance quarter immediately following the calendar quarter in which AAM was triggered.

Technological Feasibility: Advances in low-carbon fuel technologies and renewable energy sources and significant expansion in renewable fuel production capacity have made it feasible to achieve more aggressive carbon intensity (CI) reductions in the very near term. The market is ready, and the technology is available.

Economic Impetus: A near-term step-down can stimulate the green economy by incentivizing investments in low-carbon fuel production, infrastructure, and research & development. A 30% or higher reduction by 2030 combined with a 9% stepdown in 2025 supports the industries that will deliver the emissions reductions. A strong signal is needed to spur continued investment and support the entities already providing emissions reductions. Without the increased reduction to at least 30% and an aggressive 9% stepdown, the demand for credits will remain low, causing low carbon fuel producers to lose competitiveness against petroleum and higher-emission fuel producers and deter future investment.

Health and Environmental Benefits: More stringent CI reduction targets will lead to significant reductions in harmful pollutants, resulting in cleaner air, fewer health-related issues, and a safer environment for Californians.

Economic Resilience: By setting a clear path for CI reductions, LCFS stakeholder and low carbon fuel producers can plan and invest with certainty, fostering innovation and creating jobs in the green energy sector.

Sustainability Requirements

The transition to electrification and hydrogen for heavy duty vehicles, locomotives and other transportation types that rely on diesel fuels will take decades. The transition to sustainable aviation fuels will similarly take decades. The transition to a fully electrified light and medium duty vehicle population will likely not happen in the next decade. The carbon reduction being delivered by alternative diesel fuels and other bio-based fuels is especially critical in the next 10-20 years because globally we need as much carbon reduction as possible to avoid reaching irreversible (or extremely difficult to reverse) tipping points that will further accelerate global warming with catastrophic results. Thus, bio-based fuels produced from a variety of feedstocks are critical in the near and intermediate term.

That said, Crimson supports establishing strong sustainability and related tracking requirements, but urges that CARB set standards / requirements for sustainability for crop-based biofuels via a stakeholder input process rather than simply adopting an existing sustainability framework such as ISCC or RSB. During the April 10th workshop, CARB Staff stated “biofuel production must not come at the expense of deforestation or food production.” Crimson supports this sentiment. However, also during the April 10 workshop CARB Staff confirmed they had not establish specific sustainability requirements for crop-based biofuels, and stated that it would likely implement existing third party

sustainability frameworks such as ISCC or RSB. The LCFS is a performance-based program; it sets carbon reduction targets for transportation fuels that must be met. To be consistent with a performance-based program, CARB should establish specific sustainability requirements that are consistent with LCFS program objectives and develop such requirements via a stakeholder input process.

065.2
cont.

CARB has thus far not specifically laid out the specific sustainability problems it seeks to solve. This is integral to the process of establishing requirements. For example, what specific environmental, social, and economic criteria are essential for the California LCFS program and how are these aligned with program goals? To better meet CARB Board members request to “explore guardrails,” we ask that CARB not establish specific sustainability certification requirement during this LCFS rulemaking and Instead work via a stakeholder input process to develop specific program sustainability objectives and requirements that are practicable for implementation by the biofuels value chain. As it relates to crop-based biofuels, CARB should ensure that sustainability requirements encourage climate smart agricultural practices rather than provide disincentives.

REET Correction

065.3

We support the comments of the Clean Fuels Alliance America (CFAA) where CFAA highlights the error in the prior model correction. Specifically, the CA-REET 4.0 tailpipe emission factors for NO_x and CH₄ for biodiesel and renewable diesel. In the prior correction staff, instead of adjusting emissions by 2.74 gCO₂e/MJ, adjusted it by 4.78 gCO₂e/MJ. This incorrectly lowers the emissions reductions from biodiesel and renewable diesel.

In conclusion, we believe that amendments to the LCFS to increase the stringency of CI reduction targets through 2030, implement a step-down in CI benchmark stringency in 2025, and the introduction of the Automatic Acceleration Mechanism are urgently necessary and should be implemented in 2024. However, we urge CARB to take a more aggressive stance on these amendments as noted above in order to strengthen the California LCFS and send market signals that will not jeopardize low carbon fuel production investments made to date and encourage further growth and investment.

Thank you for your consideration of the above comments

Sincerely,
Harry Simpson
President & CEO
Crimson Renewable Energy

May 10, 2024

VIA ELECTRONIC FILING

Ms. Rajinder Sahota
Deputy Executive Officer - Climate Change & Research
California Air Resources Board
1001 I Street
Sacramento, Ca 95814

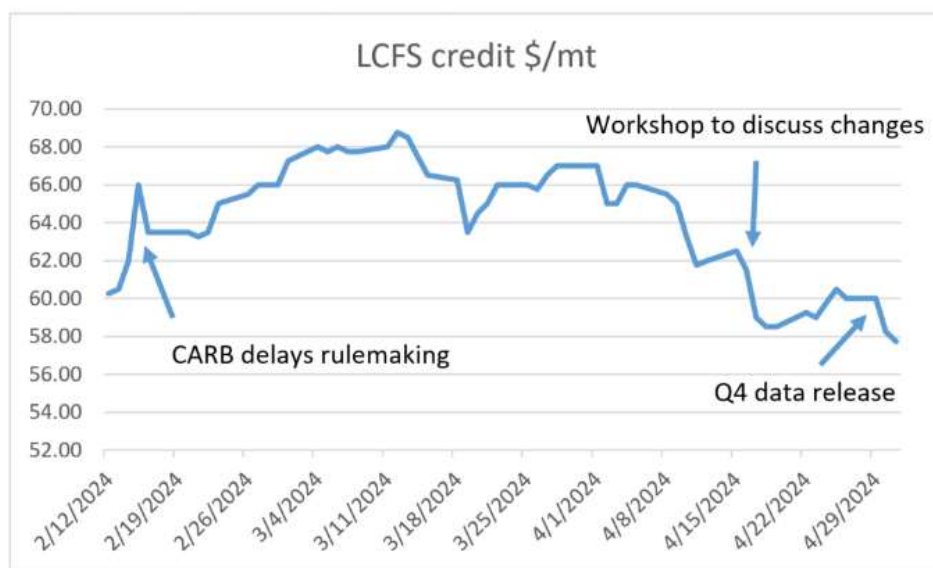
Re: Neste Comments on Low Carbon Fuel Standard (LCFS) Workshop Held on April 10, 2024

Dear Ms. Sahota:

Neste appreciates the opportunity to provide these comments to the California Air Resources Board (CARB) regarding the LCFS program updates presented at the April 10, 2024 workshop. These comments are in addition to the comments submitted by Neste for the 45-day regulatory package on February 20, 2024¹, and we hope that CARB considers all of our recommendations as part of this LCFS rulemaking.

Neste continues to believe that finalizing this rulemaking quickly is the highest priority and that CARB must pursue more aggressive CI reductions. The sharp price declines since CARB released the 45-day regulatory package, and the continued decline since CARB delayed the rulemaking and hosted the April 10th workshop, demonstrate that the market firmly believes the CI reduction goals currently being discussed are not aggressive enough to balance out the credit market (see Figure 1 below). The market price is reflecting the broad belief that there are too many credits available today and the demand for those credits is unlikely to outpace supply in the near future. Market participants that are holding credits are selling them at lower and lower prices because the supply of credits continues to outpace demand, as reflected by the continued increases in the credit bank quarter after quarter. Current market prices reflect the belief that supply will remain above demand even after this rulemaking and prices for credits currently trading for 2025 transfer (currently only \$3 above prompt values) demonstrate a lack of confidence in the proposed regulatory updates having any meaningful effect on the supply and demand imbalance. We urge CARB to prioritize this rulemaking and ensure it is completed by **2nd quarter 2024**.

Figure 1: LCFS Credit Prices Trends (in USD) from February 2024 through May 2024



¹ <https://www.arb.ca.gov/lists/com-attach/6974-lcfs2024-B2IUN1YkACcLaARb.pdf>

Neste recommends the following as part of the LCFS rulemaking to ensure it adequately addresses market concerns:

066.1 cont.

- Ensure the regulatory updates go into effect in 2024 to avoid further unrealized emissions reductions due to overperformance of the credit market;
- Apply an immediate CI step-down of **12%** (and not the proposed 5%) in 2025 to adequately address the large credit bank and to provide a predictability to a credit market that is unsure how the bank will be addressed;
 - Neste also supports the 9% step down proposed by staff if it means CARB can more quickly finalize this rulemaking
- Start applying the CI Automatic Acceleration Mechanism (AAM) proposed by CARB in 2026 (using 2025 data) and not wait until 2027 to address overperformance in the LCFS credit market should it persist; and
- Avoid an arbitrary cap on feedstocks used to produce renewable diesel and SAF. Such a cap would likely have the unintended consequences of extending dependence on fossil fuels, exacerbating air quality challenges, and compromising the ability to decarbonize the aviation and maritime sectors.

Below is a detailed discussion of the updates presented in the April 10th workshop. Neste also supports the comments from the Low Carbon Fuels Coalition (LCFC) and ICF on this rulemaking. We appreciate your consideration.

Overview of the Comments on the LCFS Program Updates Presented on April 10, 2024

Step Down CI Reduction Is Needed Immediately to Stabilize the LCFS Carbon Market:

Neste sees an immediate step down in the CI as integral to quickly addressing the overperformance of the LCFS program and the depressed credit prices. The credit market continues to indicate that CARB is not being aggressive enough in this rulemaking, and credit prices continue to drop as CARB seems to continue favoring just a 5% step down. The market is making it very clear that more needs to be done to address the credit bank in the short term, and it is precisely why Neste continues to support a step-down of 12% as modeled by ICF². In the April 10th workshop CARB also modeled a 9% step down, and Neste is willing to support this step down if it means a quicker approval of this updated LCFS regulation. This higher 9% step down will bring predictability to the credit market as to how the credit bank will be addressed versus relying on the unpredictable automatic acceleration mechanism to trigger in 2-3 years. Addressing the credit bank more quickly will also make new technologies more competitive in the LCFS, and this includes electrification and hydrogen. Therefore, it is paramount that CARB pursues the predictable 9% step down to start decreasing the credit bank in 2025. Delaying credit bank reductions will likely delay implementation of new technologies.

066.2

The need for a step down near 9% is further bolstered by several assumptions CARB made in the CATS modeling that all lead to a significant underestimation of future credit generation. Firstly, the CATS assumes a CI of 61 g/MJ for renewable diesel even though the average CI for renewable diesel in California is in the 30-40 g/MJ CI range. This inflated CI used in the CATS model leads to a significant underestimation of the credit generation from renewable diesel, and thus millions of credits annually are not accounted for in the CATS model. Secondly, CARB seemed to also assume renewable diesel would peak at 2.1 billion gallons per year and then slowly decrease, however renewable diesel is virtually at this volume as of 2023³ and only continues to grow as new production comes online. This lower renewable diesel consumption assumed by CARB translates to a higher fossil diesel volume in the CATS model, resulting in higher deficits than what are

066.3

² <https://www.arb.ca.gov/lists/com-attach/7078-lcfs2024-VDVcNFlyVGsLdFQu.pdf>

³ https://ww2.arb.ca.gov/sites/default/files/2024-04/quarterlysummary_Q42023.xlsx

066.3
cont. actually occurring today. Lastly, Neste also believes that this LCFS rulemaking will eliminate some bottlenecks for ZEV and H₂ adoption, further increasing credit generation. This all results in the CATS underestimating credit generation from renewable diesel, and thus the credit bank will grow quicker than CARB has estimated.

066.4 ICF also found that CARB did not correctly calculate the fossil diesel baseline as part of the 45-day package. ICF determined that CARB should only add CH₄ and N₂O tailpipe emissions and not CO₂ because they are biogenic. The diesel baseline should therefore be 103.19 g/MJ and not 105.76g/MJ. This further changes the CATS modeling results because the diesel baselines shifts credit/deficit generation for diesel. To truly
066.5 balance the LCFS credit market, **a 9% CI step down must be made in 2025**. This step down is needed before the AAM can be effectively implemented, otherwise the AAM could be triggered excessively and overperformance will persist.

Neste Agrees with CARB that There is NO Causal Relationship Between the LCFS and Fuel Prices:

066.6 Neste agrees with CARB that there is no causal relationship between the LCFS credit price and what consumers pay for fuel at the pump. As noted on page 3 of our February 20, 2024 comment letter⁴, the price consumers pay at the pump is directly linked to the cost of petroleum crude. Thanks to the LCFS, California has sped up the phaseout of fossil fuels, and thus created a market with more options for consumers. That is further reflected by renewable diesel being priced similarly to fossil diesel in California⁵.

Automatic Acceleration Mechanism (AAM) Should Start in 2026 (using 2025 data):

066.7 Neste continues to support the need for the AAM and continues to believe that it should be available in **2026** (using 2025 data) and not wait until 2027. It is essential that CARB have this mechanism in place should overperformance persist in the long term, and to balance out the credit market more quickly so that renewable fuel producers can feel more confident investing in new production.

Neste reiterates support for ICF's recommendation that the AAM triggers be reevaluated to ensure a smoother reduction of the credit bank. By lowering the "Credit Bank to Average Quarterly Deficit Ratio" AAM trigger from 3 to 2.5, CARB can provide an even more predictable credit market.

Sustainability Certifications Can Drive Further Decarbonization:

066.8 Neste supports the inclusion of sustainability certification requirements versus an arbitrary cap on feedstocks to address concerns with the growth of crop and forest-based feedstocks. Neste supports the comments made by CARB staff at the April 10th workshop regarding the impacts of a cap, principally that
066.9 fossil fuels would backfill liquid renewable fuels with such a cap. A cap will likely lead to higher GHG, criteria and toxic pollutant emissions, and result in higher health impacts to local communities.

Proponents of the cap are also using incorrect, inconsistent and outdated data, making their support for the cap technically flawed. Examples include:

- Most proponents of the cap argue that crop-based feedstocks are driving all growth in liquid renewable fuel production, however CARB shows in slide 53 of the April 10th workshop presentation that waste and residues drove most growth in 2022-2023.
- Most supporters of the cap are pressing CARB to be less aggressive in this rulemaking because of concerns with higher energy prices for the consumer, while also arguing that the cap is needed to stop lower cost renewable diesel from delaying the implementation of electrification.

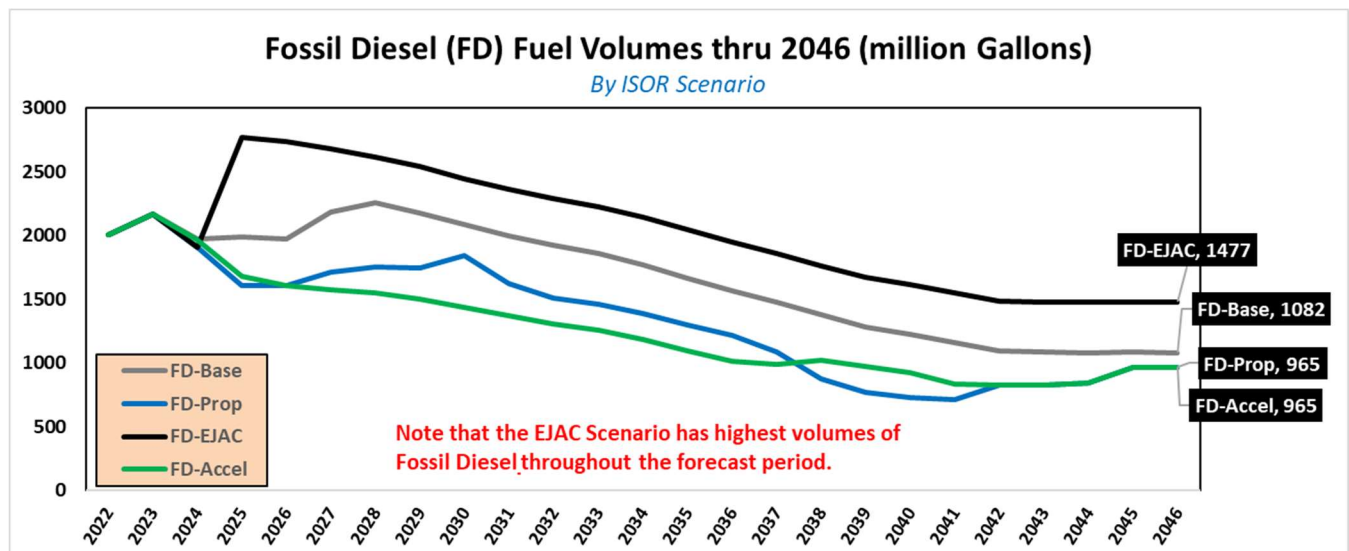
⁴ <https://www.arb.ca.gov/lists/com-attach/6974-lcfs2024-B2IUN1YkACcLaARb.pdf>

⁵ <https://afdc.energy.gov/data/10969>

- Virtually all supporters of the cap also support eliminating the interstate jet fuel exemption, even though the cap would limit/reduce SAF production. Elimination of the exemption would not be successful without a robust SAF supply.
- Proponents of the cap also stated in the April 10th workshop that fossil fuels have lower emissions than several liquid renewable fuels. This could not be further from the truth as noted by countless life-cycle analyses and stack testing.

Figure 2 below shows how fossil diesel fares under each scenario evaluated by CARB in this rulemaking. Under the EJAC scenario (black line) there will be sharp **increases** in fossil diesel, which is counter to the goals of the LCFS. By 2046, fossil diesel is projected to be 53% higher under the EJAC scenario than what CARB has proposed under this rulemaking (blue line). The LCFS was designed to phase out fossil fuels and not to promote their growth, so it is clear that CARB must reject the EJAC scenario. Whereas CARB's Proposal for this rulemaking and the Accelerated (green line) scenarios lead to immediate and consistent reductions in fossil diesel, and thus achieving true climate and health benefits in the short and long term.

Figure 2: Fossil Diesel Consumption Under Each Scenario Evaluated by CARB



Neste also believes that sustainability certifications will increase the costs of sourcing feedstocks for renewable fuel production, and CARB can prevent the consumer from absorbing these costs by recognizing the emissions reductions from climate smart agriculture (CSA). These emissions reductions are already being certified through several sustainability certification schemes such as ISCC. In fact, the IRS guidance accompanying the 40B SAF-GREET model allows some crop-based feedstocks to reduce their carbon intensity (CI) score if certain CSA practices were employed in their production. CI reductions for no-till, cover crop and enhanced efficiency fertilizer will be accounted for in CI calculations. Neste believes that recognizing CSA strikes the right balance between ensuring feedstocks are sourced sustainably and at the same time leverages available data to provide more value to those producers that are working towards decarbonizing their energy production. Recognizing CSA also allows the LCFS to continue driving innovation, which is one of the most important priorities for this regulation.

Land Use Change Evaluations Should Occur for all Feedstocks:

Neste supports CARB's proposal to establish empirical methods to evaluate ILUC of feedstocks, ensuring consistency and fairness across feedstocks. Neste requests that CARB work with liquid renewable fuel producers to define this proposal and to establish guidelines for this new process to ensure

066.13
cont.

consistency/fairness in these new ILUC evaluations. We also believe that these new ILUC evaluations should be applied not only to new feedstocks but also to those that CARB already analyzed in 2015 (corn, soybean, canola). By doing so, the market will have the incentive to develop more sustainable feedstocks while maintaining empirical justification of their reduced ILUC.

An example of this is winter canola. Despite primarily being produced in the Northern Great Plains (Montana, North Dakota, Minnesota, etc.) with spring varieties, growing winter canola after wheat in regions where wheat/fallow rotation is a common practice (for example, in the US Great Plains) can lower the risk of displacing food production. Moreover, some studies suggest that winter canola can increase yields of subsequent wheat⁶, break wheat pest cycles and improve soil health thanks to soil coverage increase and crop rotation diversification. This combined with the production of canola meal (around 60% of grain production) to the food industry can considerably reduce the ILUC risk and even bring additionality.

Some efforts are already ongoing to effectively analyze and quantify the potential impact on ILUC for this winter canola. The most outstanding one is being led by the US Canola Association together with Purdue University and Argonne National Laboratory (organization that provided ILUC values in 2015 for CARB's GTAP analysis), who are working to "update the ILUC values, establish a separate LCA for winter canola and incorporate canola into the GREET model"⁷.

General Comments on Slides Presented at the April 10th Workshop:

Neste also has the following general comments on the slides presented at the April 10th workshop:

066.14

1. **Renewable Diesel/Biodiesel Percentage on Slides 22-23:** CARB seems to be assuming that the renewable diesel/biodiesel percentage will be in the 47% range in 2030, when in fact it is already 66% as of 4th quarter 2023⁸. This is a rather large difference and should be updated in upcoming presentations/modeling.

066.15

2. **UCO Pricing Information on Slide 37:** CARB seems to be using inflated UCO prices and we recommend that CARB refer to Jacobsen or Argus for more accurate pricing data. CARB assumes about \$2000 per ton of UCO when the price is closer to \$1000 per ton. It must also be noted that any cap on crop-based feedstocks will put pressure on UCO and increase costs for consumers.

066.16

Carbon Intensity Benchmark for Fossil Jet Fuel (Table 3) Needs to be Updated in Draft Regulation:

In Table 3 of the draft LCFS rule presented in the December 19th 45-day package, CARB does not appear to be using the fossil jet fuel CI of 89.43 g/MJ starting in 2025 as noted at the bottom of table. Neste requests that CARB update Table 3 to reflect the correct CI for fossil jet fuel starting in 2025.

Please feel free to contact me for additional information or questions regarding our submission.

We appreciate your consideration.



Oscar Garcia
Regulatory Affairs Manager
Neste US, Inc.

⁶ <https://access.onlinelibrary.wiley.com/doi/10.2134/agronj2011.0244>

⁷ <https://www.uscanola.com/news-views/usca-blog/carbon-intensity-of-canola-production-why-how-it-matters/>

⁸ https://ww2.arb.ca.gov/sites/default/files/2024-04/quarterlysummary_Q42023.xlsx



77 West Wacker Drive
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May 10, 2024

Ms. Carolyn Lozo
Chief, Transportation Fuels Branch
California Air Resources Board
1001 I Street
Sacramento, California 95814

Via electronic submission

Re: Proposed Low Carbon Fuel Standard Amendments – Comments on April 10, 2024, Workshop

Transportation Fuels Branch Chief Lozo:

Thank you for your continued efforts to afford ADM and other stakeholders the opportunity to comment on proposed amendments to California's Low Carbon Fuel Standard (LCFS). As we noted in our February 20, 2024, comments, and acknowledged by CARB, the LCFS has been a landmark policy for delivering millions of tons of reductions in greenhouse gas (GHG) emissions as well as substantial co-benefits, including reducing particulate matter emissions and petroleum diesel consumption. The biofuels sector has been a significant contributor to the development and implementation of the LCFS and the delivery of its environmental benefits. Companies such as ADM have led the way in producing fuels that have helped California achieve its goals and sustain its progress in reducing GHG emissions associated with transportation. We are committed to working with you to ensure the LCFS continues to be built on a foundation of sound science, dialogue, and effective implementation.

ADM's Low-Carbon Legacy and Commitment to Sustainability

As we have previously noted, ADM has transformed crops into products that serve the energy and food security needs of a growing world for more than a century. Renewable fuels have been a vital part of our business since we first produced ethanol in 1978 and added biodiesel production in 2006. Today in the U.S., we manufacture more than 1.4 billion gallons of corn-based ethanol per year at seven plants in five locations. We also produce or market more than 400 million gallons of biodiesel per year from four North American ADM-owned facilities and one for which we market product. Globally, we produce biodiesel at facilities in Europe and Brazil. Collectively, our current biofuel production operations directly support nearly 4,000 direct jobs and tens of thousands of indirect jobs. Our capacity continues to grow, with additional capability currently online at a facility in North Dakota to support renewable diesel fuel production.

Sustainability is a foundation of ADM's purpose and a pillar of our growth strategy. With global scale and a value chain that stretches from thousands of farmers to customers and end consumers, ADM is a leader in supporting the production of plant-based solutions from food and fuel to industrial and consumer products.

Our company has made significant global sustainability commitments, updated, published, and highlighted each year in our annual Corporate Sustainability Report. The most recent report is available at this link here: [Scaling Impact Report](#). A highlight of ADM's work is our regenerative agriculture program. This program leverages the land's ability to sequester carbon, enhance biodiversity, and help protect and preserve soil and water. ADM enrolled more than 2.8 million regenerative acres in 2023, recently announced a target of 3.5 million acres in 2024, and increased our 2025 goal from 4 to 5 million acres globally.

Our ongoing and accelerating efforts have provided us with experience in the development, deployment, and implementation of a robust sustainability program. This experience includes ensuring flexibility and adopting lessons learned to continuous engagement with farmers to understand their priorities, administrative burdens, and costs. As the Board considers sustainability criteria for the LCFS, keeping these and other considerations at the forefront is critical given the biofuels sectors' continued evolution, growth, and adoption of new practices. The gains our sector has seen have taken time, effort, and costs. CARB's proposal should draw from this experience and that of our partners as described in the recommendations below.

A. CARB should continue to oppose a cap on crop-based biofuels.

067.1 ADM agrees with CARB staff's assessment that calls for establishing caps on certain feedstocks are not supported by the facts, analysis, and evidence and that such caps would result in extending California's reliance on petroleum, thus forgoing opportunities to reduce GHG emissions and increasing harmful emissions. As we wrote in February, the data clearly shows that crop-based biofuels do not negatively impact the production of human or animal nutrition. Crop-based fuels, such as ethanol and biodiesel, produce both food and fuel at affordable prices. In addition, as was made clear from several comments at the April 10 workshop, the relationship between crop-based feedstocks and the resulting essential products (e.g., oils and protein) is poorly understood.

Maintaining a science-based program that incentivizes innovation will continue to drive down the carbon intensity of feedstocks and transportation fuels, supporting California's climate target. As designed, the program supports continued adoption of new, sustainable agricultural practices that our sector is implementing to lower the carbon intensity of products. Those practices are being recognized by the U.S. Department of Treasury, particularly in its recent Section 40B/SAF GREET guidance, which credits a reduction in carbon intensity for corn and soybean feedstocks farmed using certain sustainable agricultural practices.¹ As the National Oilseeds Processor Association also notes in their comments, *"the LCFS [has] driven innovation and investments in dedicated energy crops like pennycress, camelina, carinata, and winter canola; and climate smart agricultural practices."* This momentum should be continued. CARB's decision to avoid a cap will encourage these and other sustainable practices.

067.1 cont. The biofuels industry has led the way in meeting the LCFS program's goal of reducing GHG and other emissions over time, which was underscored by the data presented in April, and is well positioned to do so in the future. Caps on crop-based biofuels are contrary to the data and should be rejected.

B. CARB's sustainability proposal should be calibrated to existing standards and programs.

067.2 ADM concurs with the views expressed at the April 10 workshop that, if a sustainability program is adopted, it should leverage existing certification and verification programs. Consistency with existing programs is not only practical; it draws on the significant experience and expertise that has been brought to bear on those programs as they have developed, some, like the U.S. Renewable Fuel Standard (RFS), over the course of decades. As CARB noted in its presentation, there are credible, verifiable programs that exist. CARB should not create a new
067.3 program that has not been vetted to a similar degree. CARB should also support continued use of mass balance

¹ Notice 2024-37, Sustainable Aviation Fuel Credit; Lifecycle Greenhouse Gas Emissions Reduction Percentage and Certification of Requirements Related to the Clean Air Act; Climate Smart Agriculture; Safe Harbors (Apr. 30, 2024), available at <https://www.irs.gov/pub/irs-drop/n-24-37.pdf>.

067.3
cont.

methodology. Doing so maintains program credibility while enabling scalability. The following programs should factor into CARB's deliberations as it considers which approved programs and systems will qualify, including:

067.4

1. Renewable fuels standards: The U.S. RFS, in place for nearly two decades, is already in line with, and in some cases, exceeds CARB's proposed sustainability criteria as well as its proposal that applicable sustainability certification programs be in place for at least two years before satisfying these proposed requirements. Additionally, under the RFS:

- Fuel feedstocks must not be sourced from agricultural land cleared or deforested after Dec. 19, 2007.
- Environmental, social, and economic criteria are considered in developing annual fuel volumes under the program.
- Transparent public review of and comment on proposed annual volumes and changes to the rule are central to the continual development of the program.
- Proposed changes, public comment, and associated documents are posted on the U.S. Environmental Protection Agency's (EPA's) website for review by stakeholders and the general public.
- Scientific experts within EPA and associated technical advisory panels provide regular input regarding updates to the program.
- A rigorous audit program is maintained via EPA, which includes high standards, training to ensure competency, and transparency to the public.

067.5

For feedstocks from Canada, the Canadian Fuel Standards program was passed in 2022 and became the first national low carbon fuel program in North America. Feedstocks from Canada have similar requirements to the U.S. RFS and could also serve as a sustainability certification program.

067.6

2. Feedstock based U.S. sustainability standards: In the U.S., the Soy Sustainability Assurance Protocol (SSAP) covers 95% of soybean producers that partner with the U.S. Department of Agriculture to implement the program. The SSAP is a certified approach audited by third parties and received a technical review under the EU's Renewable Energy Directive.

067.7

3. Existing international standards: The ISCC certifies a range of feedstocks, including from soy, canola, and corn. It also has a certification and verification system that covers sustainable practices as well as social and environmental criteria. Participating farmers agree to host a verification audit if selected. Audit and farm data are kept private, but certificates are issued verifying compliance. The ISCC feedstock certifications have also received technical verification under the EU's Renewable Energy Directive.

067.8

The above programs broadly recognize the same key sustainability criteria, such as no deforestation, environmental stewardship, and regulatory compliance. Additional standards should not be added. Using the RFS as a baseline and allowing the flexibility to recognize other programs would avoid the burden of duplicative criteria and reporting, allowing the program to stand on proven ground while ensuring that biofuels producers and feedstock providers are held to account.

C. CARB must consider farmer capacity, optionality, and emerging federal guidance.

067.9

While the April 10 workshop provided a sound starting point for the discussion on program requirements and options, further work is needed. Key stakeholders in follow-up sessions should include farmers and those who work closely with farmers. It is critical that our agricultural community is provided with certainty and

067.9
cont. straightforward, reliable methods and instructions for compliance to ensure continued growth and success. Additional issues for discussion should include:

- 067.10 • Capacity – as program details are designed, farmer input will be critical to ensuring that the program does not raise input costs, that compliance costs are manageable, and that data privacy is assured. Leveraging existing programs may address some of these concerns.
- 067.11 • Flexibility – given evolving practices in agriculture and a changing biofuels sector, participants should be given flexibility regarding which program they can qualify under. Providing this flexibility will allow different crops from different regions to qualify, ensure broad participation, and encourage sustainable practices.
- 067.12 • Reciprocity – as federal tax credits are issued under the Inflation Reduction Act (IRA), climate smart agriculture practices and technology pathways that are incorporated in the IRA guidance issued for federal tax credits should similarly qualify for the program.

D. Protecting and promoting North American Feedstocks

067.13 Feedstocks that are either high risk or come from high-risk regions should be required to comply with “additional detailed traceability, verification, and/or enforcement of waste feedstocks to avoid fraud” as noted in the April 10 workshop. Doing so would create a level-playing field with U.S. feedstocks, particularly when sustainability requirements are added, and protect the integrity of the LCFS and the RFS. As we noted in our February letter, the rise of international used cooking oil (UCO) feedstocks imported into the U.S. market has skyrocketed from 300 million pounds in 2021 to 3 billion pounds in 2023 after the establishment of more incentives for their use in producing lower-carbon fuel. Much of this UCO is leveraged for LCFS compliance in the California market, which could be appropriate if imported UCO feedstock was competing with alternatives on a level playing field. However, the significant influx of UCO from overseas raises questions about its sourcing and, at a minimum, calls for greater scrutiny to ensure integrity of the LCFS program and the fuels consumed in the state. Thus, we recommend that the principles reflected in the proposed sustainability criteria also be established for all higher risk waste-based feedstocks such as imported UCO.

Conclusion

067.14 Finally, we ask that CARB consider extending the period of compliance from 2028 to 2030. Doing so will support a smoother transition for farmers and biofuel producers anticipated to be impacted the proposed sustainability provisions. This timetable also aligns with the 2030 GHG reduction milestone as well as the approximate timeframe for the next update to the Scoping Plan.

As this work continues, we ask that CARB deepen its partnership with the agricultural industry as we grow, evolve, and supply California consumers with food and fuels in a sustainable manner. The LCFS program is a key policy to further catalyze our and others’ sustainability efforts and associated learnings. Careful implementation of sustainability provisions anchored to existing certification programs and allowing for an appropriate transition will be fundamental to ensure the amendments support the continued effectiveness of the LCFS. A robust LCFS sends a clear signal to the market and supports continued investments in lower carbon feedstocks as well as carbon reduction efforts, including regenerative agriculture practices.

ADM notes its support and alignment with comments submitted by the National Oilseed Processors Association, Growth Energy, Clean Fuels America, and California Advanced Biofuels Alliance. Thank you for the opportunity



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to share these comments as the CARB staff and Board complete their work. Please do not hesitate to contact me or our Vice President – State Government Relations Greg Webb (webb@adm.com) with any questions.

Respectfully,

A handwritten signature in black ink, appearing to read "Greg Morris", is written over a light blue horizontal line.

Greg Morris
Senior Vice President
President, Ag Services and Oilseeds
ADM

cc: California Air Resources Board

Liane Randolph, Chair
Rajinder Sahota, Deputy Executive Officer
John Eisenhut, Board member
Susan Shaheen, Ph.D., Board member
John R. Balmes, MD, Board member
Diane Takvorian, Board member
Cliff Rechtschaffen, Board member
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Davina Hurt, Board member
V. Manuel Perez, Board member
Eric Guerra, Board member
Nora Vargas, Board member
Tania Pacheco-Werner, Ph.D., Board member
Gideon Krakov, Board member
Senator Henry Stern, Board member
Assemblymember Eduardo Garcia, Board member
Matthew Botill, Chief, Industrial Strategies Division

Submitted Comment

Name

Kathleen Dolson

Affiliation

N/A

Subject

Factory Farms

Message

Including factory farm gas in California's Low Carbon Fuel Standard would incentivize more corporate factory farms, harming family farmers, rural communities, our environment and climate, in Missouri, the Midwest and across the U.S.

The LAST thing this planet needs is more CAFOs!!!

File Upload (i.e., Attachments):

N/A

068.1

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May 10, 2024
VIA ELECTRONIC FILING

Matthew Botill
California Air Resources Board
1001 I Street
Sacramento, California 95814

Re: Anew Climate Comments in Response to the LCFS Workshop Held April 10, 2024

Dear Mr. Botill:

Anew Climate, LLC (“Anew”) is one of the largest climate solutions providers in North America and has an established track record of participating in California’s various sustainability programs, including the Low Carbon Fuel Standard (“LCFS”). We commend the California Air Resources Board (“CARB”) and its staff for its successful implementation of the LCFS, driving the decarbonization of California’s transportation sector, and proposing amendments to the LCFS in response to the 2022 Scoping Plan Update. The LCFS has a significant role in helping California achieve its ambitious climate goals and we appreciate the opportunity to provide comments on the April 10, 2024, workshop discussion.

Our most important recommendations for CARB in response to this workshop are:

- Implement a **step-down** in carbon intensity (CI) targets of **at least 9%**,
- Revise the **2030** CI reduction target to **at least 30%**,
- Tighten the proposed automatic acceleration mechanism,
- Implement these **changes as soon as feasible**, but no later than January 2025,
- Send a strong signal to **shore up investor confidence** in methane abatement projects.

Increased Program Ambition and Timely Implementation of a Step-Down in CI Targets of at Least 9% Are Critical to the Continued Success of the LCFS

As we previously stated in our February 2024 comments, a significant and near-term step-down in the Annual CI Benchmarks is critical to ensure the continued success of the LCFS program. Shortly after the April workshop, data was released that showed another record surplus, with 8.5 million credits generated in the last quarter of 2023. For all of 2023, that meant a surplus of nearly 8.2 million credits. All available data currently points to continued credit bank growth in 2024 as more credits are being generated than are needed to meet the current CI benchmarks. The ever-increasing credit surplus has stalled market activity. Unless CARB acts quickly and decisively, it is possible that the market will fall even further. This undermines a key goal of the program - to incentivize investment in low-carbon fuels and fuel technologies.

On April 23, CARB staff presented different options for an immediate step-down. **The proposed 9% step-down in 2025 to a level of 22.75% below the 2010 baseline is the only option that has a chance to counter the ever-faster build-up of the LCFS credit bank.**

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San Francisco, CA
Los Angeles, CA

Calgary, AB
Budapest, Hungary

069.1
cont.

Implementing the step-down as soon as possible is just as important as setting the level of the step-down at 9%. Any further delay in implementation of the program revisions will only serve to further accelerate the growth in LCFS surplus credits and make it more difficult to correct. Near-term action by CARB is now required to send a reassuring signal to investors that California remains committed to rapid decarbonization of its transportation sector and that investments in low-carbon fuels continue to be adequately rewarded and incentivized.

We Support a 30% or Greater Reduction in Carbon Intensity by 2030

069.2

As in previous comments, while we would also support a higher CI reduction target, we recognize that a reduction scenario of at least 30% would help set California on a path to meet its ambitious target of at least a 40% reduction in economy-wide GHGs by 2030 and carbon neutrality by 2045. Strong CI reduction goals will continue to accelerate carbon reductions in the transportation sector while establishing clear market signals that will drive innovation and investments.

We Support Tightening the Automatic Acceleration Mechanism

069.3

We have consistently supported the concept of creating an automatic acceleration mechanism (“AAM”) as a tool within the LCFS and appreciate the inclusion of the AAM in CARB’s proposal. We urge CARB to design the details of the mechanism to ensure that the AAM is triggered when the market truly needs it.

As we have stated before, the AAM should be amended such that it could be triggered as soon as 2026 if the applicable trigger conditions are met. Additionally, the AAM should be triggered when both the “Credit Bank to Average Quarterly Deficit Ratio” exceeds 2.5 and annual credit generation exceeds the annual deficit generation for the compliance year preceding the year of the May 15 announcement.

CARB Should Send a Signal to Shore Up Investor Confidence in Methane Abatement Projects

069.4

Anew appreciates the many occasions on which CARB staff has explicitly reiterated its support for RNG throughout this multi-year conversation around revisions to the LCFS, including in the most recent workshops and in the ISOR. We would like to reiterate that if CARB truly wants methane abatement from sources such as agricultural wastes to continue, this rulemaking must convince the clean fuel investment community that RNG will remain a viable and important contributor to the LCFS framework.

As such, we recommend that CARB refrain from imposing an end-date for avoided methane crediting. Any such measure would not only hinder continued investment into methane abatement at farms that LCFS has been instrumental in catalyzing, but also jeopardize the long-term economic viability of existing RNG production assets, which are subject to significant operational expense. We strongly urge CARB to continue following climate science on a

- 069.4
cont. technology-neutral basis and to maintain the framework that has catalyzed investment into methane abatement of swine and dairy operations.
- 069.5 In addition, and as we have stated previously in more detail, it is our view that CARB should maintain eligibility for delivery of biomethane without added restrictions. There is no evidence that new deliverability requirements would help to ensure progress toward the state’s methane reduction targets. We therefore do not agree with CARB’s ISOR proposal to impose new requirements for projects that break ground after 2030.
- 069.6 We further recommend a full credit true up to reflect the true environmental performance of RNG pathways. We have previously recommended that pathways should be allowed to fully “true up” LCFS credit generation to their actual CI score once that score is determinable based on actual greenhouse gas performance data. In addition, we recommend that if the verified CI is higher than the certified CI, the project should simply repay CARB for any excess credits
- 069.7 claimed and not be subject to any further enforcement liability unless there is fraud or other conduct contrary to the objectives of the program.

Conclusion

We thank CARB for its important work in implementing the LCFS program. Swift action is required now to ensure that the program will continue to work as intended and maximize opportunities to decarbonize California’s transportation sector. Should you have any questions about anything we have stated here or seek further clarification, please contact me at abrosnan@anewclimate.com

Sincerely,

Andrew Brosnan
President, Low Carbon Fuels
Anew Climate, LLC

May 10, 2024
VIA ELECTRONIC FILING

Matthew Botill
California Air Resources Board
1001 I Street
Sacramento, California 95814

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In addition, and as we have stated previously in more detail, it is our view that CARB should maintain eligibility for delivery of biomethane without added restrictions. There is no evidence that new deliverability requirements would help to ensure progress toward the state's methane reduction targets. We therefore do not agree with CARB's ISOR proposal to impose new requirements for projects that break ground after 2030.

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Sincerely,

Andrew Brosnan
President, Low Carbon Fuels
Anew Climate, LLC



May 10, 2024

BY ONLINE SUBMITTAL

California Air Resources Board
1001 I Street
Sacramento, CA 95814

ATTN: Liane Randolph, Chair
Steven S. Cliff, Ph.D., Executive Officer
Rajinder Sahota, Deputy Executive Officer

Re: Comments on the April 10, 2024 LCFS Public Workshop

Southern California Edison (SCE) appreciates the California Air Resources Board's (CARB's) staff's efforts to continue to collaborate with stakeholders on modifications to the proposed Low Carbon Fuel Standard (LCFS) regulation amendments and the opportunity to provide written comments on the April 10, 2024, LCFS public workshop.

LCFS Benefits EV Drivers and Is Helping Accelerate EV Adoption

SCE supports LCFS as it has been instrumental in accelerating EV adoption and providing benefits to EV drivers within SCE's service area and across the state. As an active participant in the LCFS, SCE implements multiple LCFS-funded transportation initiatives and serves as the CARB-mandated California Clean Fuel Reward (CCFR) administrator. Since 2017, LCFS funding for the CCFR and SCE's independent programs have provided rebates on the purchase of more than 290,000 electric vehicles.

Starting this year, SCE is expanding its offerings of LCFS-funded projects to include rebates and support for non-vehicle TE equipment as well as additional vehicle incentives. Between authorized and programs pending CPUC authorization, SCE expects to spend approximately \$375 million in LCFS Holdback credit revenues through 2027. Eighty percent of this funding is for programs and services that benefit equity communities.

A few of the current and proposed LCFS-funded projects within SCE's portfolio include:

- Pre-owned EV rebate program – In market since 2021, provides a rebate on the purchase or lease of a used EV, including a \$4,000 incentive for low-income drivers.
- Charge Ready Home – Launched in March 2024, provides eligible low-income customers with a rebate up to \$4,200 for a home electrical panel upgrade and necessary circuit to support EV charging.
- Zero Emission Truck, Bus, and Infrastructure finance program – Expected to launch in June 2024 will provide better capital access for fleet electrification in partnership with the California Treasurer’s Office.
- Drayage truck rebate – Expected to launch in June 2024, will support the electrification of ~5% of the drayage trucks in SCE’s service area.

Additional details are provided in SCE’s “How the Low Carbon Fuel Standard (LCFS) Benefits Customers” document, included in the appendix.

SCE Supports the Proposed Amendments to the LCFS Regulation, but Additional Modifications are Needed to the Proposed Amendments to Provide Clarity and Address Implementation Challenges

071.1 SCE supports the proposed LCFS regulation amendments but requests a few modifications to
improve clarity and address implementation challenges. Among other things, SCE supports the
071.2 Proposed Amendment’s recommendations to: (1) establish an automatic acceleration
071.3 mechanism (AAM); (2) adjust the minimum contribution of large investor-owned utilities (IOUs)
071.4 towards the Clean Fuel Reward program to 50% of their base residential credit proceeds; (3) list
and provide detailed examples of pre-approved uses for utility Holdback credit proceeds; and
(4) include Vehicle Grid Integration (VGI) and workforce development as pre-approved
Holdback projects.

As detailed in SCE’s February 20, 2024 comments, SCE requests that CARB modify the proposed LCFS amendments to, among other things:

- 071.5 1. Combine the separate holdback project lists proposed for equity and nonequity projects, to improve clarity around what qualifies as an equity vs. non-equity project.
- 071.6 2. Require the large investor-owned utilities (IOUs) to use their Holdback revenues to fund at least three program options to help ensure revenues are benefiting diverse customer needs.
- 071.7 3. Retain the 10% administrative cost cap for Holdback programs, because 5% is insufficient.
- 071.8 4. Reject the 1-mile requirement for capacity credits in favor of greater flexibility.

Thank you for considering SCE’s comments and recommendations.

Sincerely,

/s/ Rosalie Barcinas

Rosalie Barcinas
Director, Electrification & Customer
Services Policy, Regulatory Affairs
Southern California Edison

APPENDIX

HOW THE LOW CARBON FUEL STANDARD (LCFS) BENEFITS CUSTOMERS

The Low Carbon Fuel Standard (LCFS) helps reduce total energy costs for customers by enabling utilities, like SCE, to fund certain transportation electrification programs and services that typically are not included in the traditional utility ratemaking processes, such as incentives for customer-side infrastructure and vehicle rebates.

SCE is using LCFS base credit revenues to fund programs and services that help incentivize EV adoption and address air quality needs for low-income customers and customers in disadvantaged communities. Using LCFS to help fund programs and services makes it easier for customers to adopt electric vehicles and is also the most cost-effective way to reduce customer's energy share of wallet.

Since 2017, SCE has distributed over \$250 million of LCFS credit proceeds to customers in its service area – \$141 million as part of the California Clean Fuel Reward and \$114 million in SCE's independent programs - providing rebates towards the purchase of more than 290,000 electric vehicles. Starting this year, SCE is expanding its offerings of LCFS-funded projects to include rebates and support for non-vehicle TE equipment as well as additional vehicle incentives. SCE's portfolio of current and proposed LCFS-funded projects consists of the following:

- Pre-owned EV rebate program – In market since 2021, provides a rebate on the purchase or lease of a used EV, including a \$4,000 incentive for low-income drivers
- Charge Ready Home – Launched in March 2024, provides eligible low-income customers with a rebate up to \$4,200 for a home electrical panel upgrade and necessary circuit to support EV charging
- Zero Emission Truck, Bus, and Infrastructure finance program – expected to launch in June 2024 will provide better capital access for fleet electrification in partnership with the California Treasurer's Office
- Drayage truck rebate – expected to launch in June 2024, will support the electrification of ~5% of the drayage trucks in SCE's service area
- Subsidized public EV charging for low-income EV drivers – pending approval from the California Public Utilities Commission
- Customer-side infrastructure rebates for public heavy-duty truck charging – pending approval from the California Public Utilities Commission
- EV Maintenance Technician Training – pending approval from the California Public Utilities Commission

Between authorized and programs pending CPUC authorization, SCE expects to spend approximately \$375 million in LCFS Holdback credit revenues through 2027. Eighty percent of this funding is for programs and services that benefit equity communities.

Using LCFS to help accelerate TE adoption allows customers to reduce their reliance on expensive fossil fuel alternatives and reduces total energy costs for residential and commercial consumers. It also increases total electric system utilization, which directly applies downward pressure on electricity rates, benefiting all electricity customers, not just EV drivers. LCFS is significantly more impactful when used to accelerate TE adoption and buy down related costs, as opposed to non-targeted electric bill credits, especially within equity communities.

Submitted Comment

Name

Ira Dassa

Affiliation

Twelve Benefit Corporation

Subject

April 10 Workshop Feedback

Message

Please see the attached for Twelve's feedback on the April 10, 2024, LCFS workshop.

File Upload (i.e., Attachments):

N/A

(800) 242-4450 | helpline@arb.ca.gov

1001 I Street, Sacramento, CA 95814

P.O. Box 2815, Sacramento, CA 95812



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May 10, 2024

Liane Randolph
Chair, California Air Resources Board

cc: Rajinder Sahota, Deputy Executive Officer, Climate Change & Research
Matthew Botill, Chief, Industrial Strategies Division

Re: WRI comments on the April 10 Low Carbon Fuel Standard Workshop

Dear Liane,

Thank you for the opportunity to comment on the additional Low Carbon Fuel Standard Program workshop held on April 10, 2024. With this letter, I'm writing to highlight the fundamental structural problems researchers have identified with the Global Trade Analysis Project (GTAP) model, which CARB currently uses to estimate emissions from land use change (LUC) associated with crop-based biofuels.

I have strongly supported the LCFS in the past and hope to be able to continue to support it in the future, but I am alarmed by the flood of crop-based renewable diesel that has entered the LCFS market in the last few years.

To respond to a question posed to environmental stakeholders during the April 10th workshop: I would love to see as much fossil diesel as possible replaced with cleaner drop in fuels during the transition to electrification, but only if those replacement fuels don't come at the expense of deforestation and food production. The problem is that crop-based biofuels, unlike waste-based fuels, do come at the expense of deforestation and food production, and are actually substantially worse for the climate than fossil diesel.

Slide 51 of the April 10th presentation says that biofuels production must not come at the expense of deforestation and food production. But that is exactly what crop-based renewable diesel does, as Colin Murphy and former CARB Board member Dan Sperling note in their [LA Times op-ed](#). This should also be clear from the sheer scope of the world's growing appetite for biofuels. Straightforward calculations indicate that supplying even 25% of the world aviation fuel from vegetable oil would require (at average yields) doubling the world's area of cropland. For this reason, the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) categorically excludes crop-based fuels and the European Union has capped their use under its renewable fuels policy.

Slide 56 shows that 6 million tons of US soybean production is going to non-food uses, particularly biofuels—A 50% increase since 2020. And while there are other factors as well, Slide 54 correctly notes that increased demand for biofuels has increased the price of vegetable oils.

Basic economic logic tells us that increased vegetable oil prices result in increased production, and empirical studies show that at least some of that increased production comes from deforestation. Globally, net cropland area expanded by about 11 million hectares per year during 2011-2019.

Regardless of the specific source of feedstocks for crop-based biofuels, this market-driven deforestation

073.1 cont. and the associated LUC emissions are the reason why the safeguards discussed in the April 10 workshop presentation do not solve the problem. This is also demonstrated by the extremely close relationship between the price of soybean vegetable oil in the U.S. and palm oil in Southeast Asia. (The GTAP model assumes otherwise, but there is no empirical basis for this assumption.)

073.2 Slide 65 proposes using an empirical approach to establishing LUC values for certain crop-based fuel-feedstock combinations. This could be an important step forward, depending on how it is done, but the empirical approach must include market-driven indirect land use change, rather than focus only of feedstocks sourced directly from converted areas. Furthermore, new empirically based LUC emission values are needed for all crop-based fuel pathways, including those that are covered in Table 6 of the current LCFS regulation. This is because the LUC values in Table 6 calculated with the GTAP model have no reasonable scientific basis and are systematically biased downward as demonstrated clearly by the report [submitted to the 45 day LCFS docket](#) by Professor Berry.

073.4 The values in Table 6 (reproduced on Slide 64) reflects the fundamental flaws in GTAP. Given that vegetable oils are largely substitutable for each other and that their prices are highly correlated there is no rational basis for believing that there is a substantially different LUC value for Palm Oil than for Soy Oil or Canola.

073.5 Recalculating LUC values for crop-based fuels using an approach grounded in reality may be the best way to ensure that biofuels don't come at the expense of deforestation and food production. Updating LUC values for crop-based fuels, particularly renewable diesel made from virgin vegetable oils, could be an effective safeguard If CARB is able to accomplish this concurrently with the other updates to the LCFS considered in the current rulemaking. If this is not feasible then capping the use of crop-based fuels is essential in the interim to ensure that there is not a rapid increase in reliance on crop-based renewable diesel to levels well beyond those projected in CARB's modeling.

I would greatly appreciate an opportunity to discuss these issues with you and would be happy to arrange a meeting with Steve Berry and Tim Searchinger to discuss the findings of their analysis of the GTAP model.

Sincerely,

Dan Lashof, U.S. Director, World Resources Institute



May 10, 2024

Submitted electronically at <https://ww2.arb.ca.gov/public-comments/low-carbon-fuel-standard-workshop-april-10-2024>

Clerk's Office
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Twelve Benefit Corporation Feedback on CARB's April 10, 2024, Low Carbon Fuel Standard Workshop

Dear Sir/Madam:

Twelve Benefit Corporation (Twelve), which submitted written comments on the California Air Resources Board's (CARB) Low Carbon Fuel Standard (LCFS) 45-day rulemaking package in February, appreciates the opportunity to provide additional feedback in response to the LCFS Workshop that CARB held on April 10, 2024.¹

074.1

We take this opportunity to again urge CARB, for the reasons we laid out in our earlier comment letter and reiterate here, to put in place regulatory provisions under the LCFS Program that will promote rather than inhibit the production and uptake in California of ultra-low carbon intensity (CI) Power-to-Liquid Sustainable Aviation Fuel (PtL SAF) such as Twelve's E-Jet® (and potentially other PtL transportation fuels). Made from water, renewable electricity, and waste carbon dioxide, not from crop-based or other biomass feedstocks, our E-Jet fuel is expected to reduce lifecycle greenhouse gas emissions by up to 90% in comparison to conventional, petroleum-based jet fuel. With the right regulatory signals, and more specifically with CARB allowing producers to use indirect accounting mechanisms (e.g., Renewable Energy Certificates) to account for the low-CI electricity that is integral to the PtL fuel production process, PtL SAF could make a significant contribution to the decarbonization of California's aviation sector. Absent this flexibility, though, Twelve's E-Jet (and the PtL SAF that other companies plan to produce) probably will not find its way to California for uplift in the state. This would be regrettable, particularly in view of California's well-earned reputation as the leading jurisdiction in the U.S. (and globally) on low carbon fuels policy.

074.2

During the April 10 Workshop, staff made it perfectly clear that CARB's ultimate goal is to wean California off combustion-based transportation fuels. While this certainly makes sense for the on-road vehicle (i.e., cars, trucks, and buses) and other sectors (e.g., cargo handling

¹ We participated in the April 10 Workshop via Zoom, but did not offer oral remarks during the public comment portion of the meeting. Our February 20, 2024, comment letter is posted in the CARB Comments Log at https://www.arb.ca.gov/lispub/comm/iframe_bccomdisp.php?listname=lcfs2024&comment_num=6888&virt_num=224, and a joint letter we submitted with several other companies is posted at <https://www.arb.ca.gov/lists/com-attach/7030-lcfs2024-VD4AaQRsU25SIABf.pdf>.

074.2
cont.

equipment) that have zero emission vehicle (ZEV) regulations in place, CARB's own analysis in the 2022 *Scoping Plan for Achieving Carbon Neutrality* shows that this is wholly unrealistic for the aviation sector. Indeed, in that influential planning document, CARB projected that SAF will account for at least 80 percent of California's aviation fuel demand in 2045, and it asserted that "the state must continue to support low-carbon liquid fuels . . . **for much harder sectors for ZEV technology such as aviation . . .**"² CARB went on to explain as follows:

California must use the best available science to ensure that raw materials used to produce transportation fuels do not incentivize feedstocks with little to no GHG reductions from a life cycle perspective. A dramatic increase in alternative fuel production must not come at the expense of global deforestation, unsustainable land conversion, or adverse food supply impacts, to name a few examples. CARB will continue to monitor scientific findings on these topics **to ensure that California policies, such as the LCFS, send the appropriate market signals** and do not result in unintended consequences.³

Twelve maintains that for the hard to electrify/hard to decarbonize aviation sector, an appropriate market signal that the LCFS can and should send *now* is the allowance of indirect accounting so as to foster the development of innovative, ultra-low CI PtL SAF. As we indicated in our earlier comment letter, without indirect accounting for renewable electricity, it will be very challenging for Twelve's E-Jet and the PtL SAF produced by others to contribute to California's carbon neutrality and GHG reduction goals. This would stem from PtL fuel producers effectively being required under the LCFS to co-locate their facilities with, or otherwise ensure a direct, behind-the-meter connection to, a renewable energy source, which is often infeasible (and in the case of hydropower, difficult or physically impossible to accomplish).

074.3

We note, too, that just last week, the federal government, for purposes of the SAF blender's tax credit in section 40B of the Internal Revenue Code (IRC), saw fit to base its approach to electricity sourcing for SAF production facilities on CARB's book-and-claim accounting provision in 17 CCR 95488.8(i).⁴ This was a welcome development under the 40BSAF-GREET Model, and from Twelve's perspective, there is no reason to think the federal government's approval of book-and-claim accounting for electricity will not also hold true for PtL SAF under the Clean Fuel Production Credit in IRC section 45Z. As CARB well knows, SAF producers, like producers of any other alternative fuel, seek to benefit from all available federal and state incentives, including the LCFS when the fuel ultimately gets uploaded to an aircraft in California.

² CARB, 2022 *Scoping Plan for Achieving Carbon Neutrality*, at 190 (Dec. 2022) (emphasis added), available at <https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf>; see also Appendix E: Purpose and Rationale of Proposed Amendments for the Low Carbon Fuel Standard Requirements, at 86. In the April 10 Workshop presentation, and specifically in slides 23, 42, and 44-46, CARB acknowledged the state's need for hundreds of millions of gallons of liquid aviation fuel, whether SAF or conventional jet fuel, in 2045.

³ 2022 *Scoping Plan*, at 191 (emphasis added).

⁴ See U.S. Department of Energy, *Guidelines to Determine Life Cycle Greenhouse Gas Emissions of Sustainable Aviation Fuel Production Pathways using 40BSAF-GREET 2024*, at 13-14 (April 2024), available at https://www.energy.gov/sites/default/files/2024-04/40bsaf-greet_user-manual.pdf.

074.4

Consistency between the federal and CARB approaches to indirect accounting is therefore imperative for credit stacking to be possible. For this reason as well, CARB should afford PtL SAF producers flexibility with respect to their renewable electricity sourcing and allow the use of indirect accounting mechanisms.

Thank you for your consideration of this additional feedback, not to mention our earlier comment letter and associated proposed regulatory revisions. Please do not hesitate to contact me or Ira Dassa (ira.dassa@twelve.co) if you have any questions.

Sincerely yours,

Andrew Stevenson

Andy Stevenson
Vice President of Commercial
Twelve Benefit Corporation
andy.stevenson@twelve.co



Submitted electronically at:

<https://ww2.arb.ca.gov/public-comments/low-carbon-fuel-standard-workshop-april-10-2024>

May 10, 2024

Clerks' Office
California Air Resources Board
1001 I Street
Sacramento, California 95814

Re: Opposition to California Air Resources Board Proposal to Regulate Jet Fuel

Dear Chair Randolph,

In response to the workshop held April 10th, 2024, we are writing to share and restate our serious concern and opposition to the recent California Air Resources Board (CARB) proposal to regulate jet fuel under its Low Carb Fuel Standard (LCFS) Program. We believe the CARB proposal will raise the cost of jet fuel without inducing additional Sustainable Aviation Fuels (SAF) production or use in California, an objective the aviation industry shares with CARB. And further, the proposal to regulate jet fuel is pre-empted by federal authority. We encourage CARB to withdraw the proposal to regulate jet fuel and instead establish a joint CARB-industry working group to explore alternative solutions to increase SAF production and use.

075.1

Alaska Airlines is committed to reducing its climate impact and achieving net-zero carbon emissions, and transitioning to SAF is core to this commitment. Our industry has committed to achieving net-zero carbon emissions by 2050, and Alaska has made the ambitious commitment to reach net-zero ten years earlier in 2040. We have long recognized that scaling up the supply of SAF and achieving net-zero carbon emissions can only happen by working collaboratively with governments and other stakeholders across sectors. Achieving this ambition for SAF will require new and additional policy incentives, streamlined permitting processes, and close collaboration among governments, the aviation industry, the fuels industry, environmental organizations and others.

Aviation accounts for 2.6% of the U.S. greenhouse gas emissions but 5% of U.S. Gross Domestic Product (GDP) and 4.1% of California's GDP, thus exerting outsize economic impact relative to its share of emissions. U.S. civil aviation firms employ more than 380,000 California-based employees, with an overall economic impact of \$194 billion.¹ Aviation is critical to driving California's economy and its rank

¹ [The Economic Impact of Civil Aviation on the U.S. Economy, State Supplement, US Department of Transportation, November 2020](#)



as the 5th largest economy in the world, enabling \$114 billion in annual trade flows and underpinning many of California's other significant economic drivers such as agriculture, tourism, manufacturing, banking, technology, and small business.

California has established itself as an early leader in attracting investment, production, and use of SAF through the existing LCFS Program. It provides an opt-in credit for SAF that helps reduce the price difference between SAF and conventional jet fuel. Ensuring a healthy and vibrant aviation industry is essential to California's future, and leveraging CARB's early leadership on SAF can enable California leadership in the emerging SAF production industry, creating new jobs and economic development opportunities.

In its April 10th, 2024 workshop, CARB reiterated that a principal objective of its regulatory proposal is to "Increase the use of alternative jet fuel in the State." We share that objective, as reflected in our company commitment to achieve net zero carbon emissions by 2040 (primarily through the purchase and use of SAF) and the US airline industry support for the US government SAF Grand Challenge. Alaska Airlines and other U.S. airlines have clearly demonstrated a strong, enduring market signal for affordable SAF. The challenge remains the supply of affordable SAF, not the absence of a market signal by airlines.

In this context, we express our serious concern about the proposal by CARB to regulate jet fuel used for flights within California as an obligated fuel under the LCFS Program. The proposal to eliminate the exemption for jet fuel used on intrastate flights would not significantly increase SAF production, availability, or use in California but would lead to higher jet fuel prices and slow down, rather than accelerate, efforts to increase the state's SAF production and use. The primary impediment to increased SAF production and availability in California remains the higher cost of SAF for producers and buyers relative to conventional jet fuel and renewable diesel. Whether or not jet fuel becomes a deficit-generating fuel has no direct impact on whether SAF is produced or used. As the proposal does not provide a mechanism to reduce the economic disadvantage of alternative jet fuel, it will have no material impact on the availability or use of alternative jet fuel in California.

In addition to not being an effective policy tool to increase SAF production, the proposal seeks to regulate jet fuel and reduce emissions from aviation, both of which are preempted under federal law, a fact that CARB recognized when it exempted jet fuel from the LCFS in 2018.² Aviation, unlike many other industries, is uniquely situated in that other factors such as the safe operation and maintenance

² CARB stated that "[s]ubjecting aircraft fuels to annual carbon intensity standards would raise federal preemption issues" available at https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2018/lcfs18/isor.pdf?_ga=2.259407882.1202437490.1641231788-253234234.1573227006





of aircraft are of great importance, which the federal government has recognized in the jurisdiction of the FAA and the EPA's Clean Air Act.

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Our mutual interest is to increase SAF production, availability, and use. The most effective way to accomplish this is to continue the positive, collaborative approach represented by the existing "opt-in" mechanism developed by CARB and the aviation community. Only actual SAF use – not merely the creation of jet fuel deficits – will provide the benefits of SAF desired by CARB, airport communities, SAF producers, and airlines. We urge CARB to reconsider and withdraw the proposal to remove the exemption for jet fuel for intrastate flights, preserve the existing opt-in approach for SAF, and establish a joint CARB-industry working group with stakeholders across the emerging SAF ecosystem to explore alternative policy and voluntary proposals to increase SAF production, availability and use in California rapidly. We look forward to working with CARB on such measures to accelerate SAF deployment.

Sincerely,

A handwritten signature in black ink, appearing to read "Scott Kennedy", written in a cursive style.

Scott Kennedy
State and Local Government Affairs Manager
Alaska Airlines

May 10, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95815

RE: Proposed Low Carbon Fuel Standard Amendments

Dear California Air Resources Board Members and Staff:

We respectfully submit the following addendum to our prior comments to the California Air Resources Board (CARB) on its proposed Low Carbon Fuel Standard (LCFS) Amendments, dated February 22, 2024, which call for equitable access to book-and-claim accounting for medium- and heavy-duty (MHD) electric vehicle (EV) charging microgrids involving hydrogen and renewable natural gas (RNG) energy sources.¹

About Prologis, Inc.

Headquartered in San Francisco, CA, Prologis, is the global leader in logistics real estate, with a portfolio of over 1.2 billion square feet across four continents and approximately 2.8% of global GDP flowing through our properties each year. Prologis leases modern warehousing and distribution facilities to customers, which include manufacturers, retailers, transportation companies, third-party logistics providers, and other enterprises. Our large, flat rooftops have enabled us to build out commercial solar installations to serve onsite and offsite load with clean energy and battery storage, helping our customers reduce their emissions and placing us second in the U.S. for corporate on-site solar.

Prologis' Mobility business is helping transform the fleet and logistics industry and enabling our customers to transition to zero-emissions through industry-leading electric vehicle (EV) charging technology and solutions. With roughly 180 million square feet of industrial real estate across our California portfolio, the opportunity for us to help our customers with this transition is significant, and we are developing dedicated charging infrastructure at Prologis sites to support their medium- and heavy-duty (MHD) fleets across last mile, drayage, and other applications. In addition to providing charging solutions at our own properties, we offer electrification services at non-Prologis buildings and are developing multi-fleet charging hubs serving areas with dense concentrations of warehouses.

Amend fueling supply equipment requirements to best serve MHD fleets

- 076.1 Prologis echoes the broader comments submitted today by the Joint MHD EV Infrastructure Parties, especially on removing the 250kW Fueling Supply Equipment (FSE) requirement and 10 FSE cap for an important additional reason: as FSE is currently defined in LCFS regulations, and depending on which equipment houses the energy meter, it could create an unintended MHD-Fast Charging Incentive (FCI) toward multi-port all-in-one cabinets when split architectures (dispensers separate from power cabinets) are critical technology catalog options for MHD projects. (See Figure 1)
- 076.2

¹ <https://www.arb.ca.gov/lists/com-attach/7026-lcfs2024-UCBUIF0zVmKkYwVi.pdf>

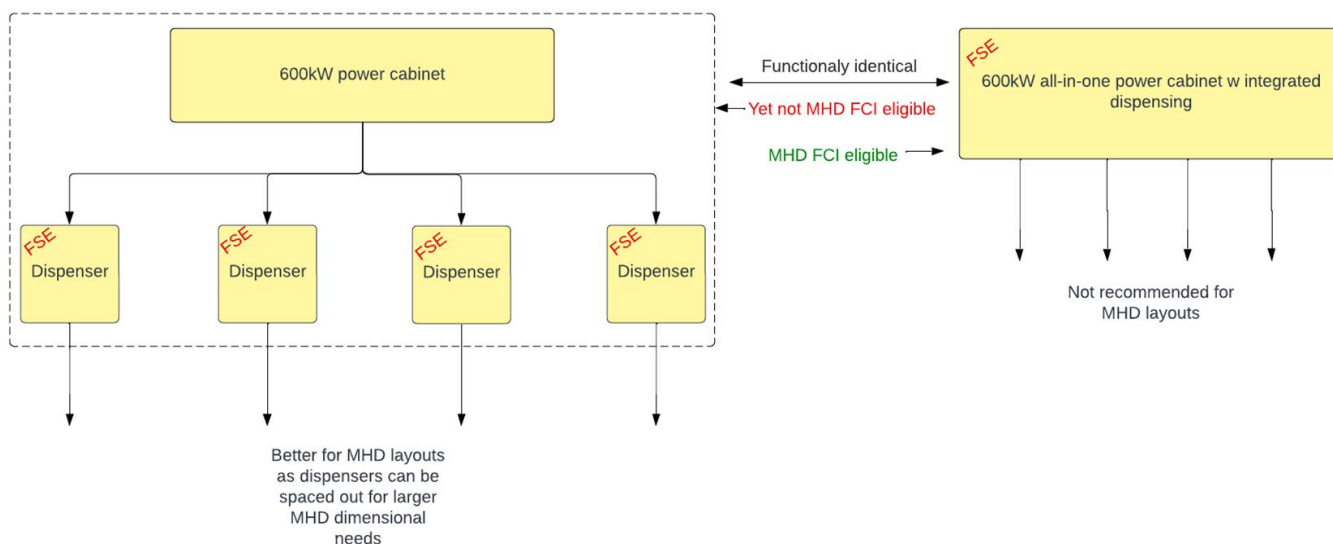


Figure 1 – Illustration of the issue caused by 250kW minimum FSE and 10 FSE maximum proposed rules in MHD-FCI

076.2
cont.

If the 250kW minimum FSE nameplate and maximum 10 count FSE per-site rules were to be adopted, it would create an unintended consequence where awkward, multi-port, all-in-one FSE designs qualify for MHD-FCI, but the functionally identical, and more ergonomic split-architecture alternatives would not. It is critical to not create this bias, as MHD layouts are significantly more sensitive to equipment placement and cable reach given the larger dimensions involved with these vehicles and the trailers that they are hauling. Site design varies widely based on MHD use case (dwell vs. corridor), and split-architecture infrastructure designs provide critical flexibility in our technology catalog for our customers. Simply removing the 250kW FSE minimum and 10 FSE maximum rules would solve the issue, while also allowing the market to self-determine how to best serve MHD fleet customers with the large-MW capacity platform of any given site.

Provide equal access to book-and-claim accounting for EV charging microgrids

We would also like to take this opportunity to reiterate the recommendations previously made by Prologis in earlier comments on revisions to LCFS, most recently in our letter dated February 20, 2024, regarding providing equitable access to book-and claim accounting for EV charging microgrids, as follows below, with one additional comment in red, as we are tracking additional technology pathways for producing hydrogen from biomethane.

Section §95488.8(i)(2)(A) states “RNG injected into the common carrier pipeline in North America (and thus comingled with fossil natural gas) can be reported as dispensed as bio-CNG, bio-LNG, or bio-L-CNG, or as an input to hydrogen production, without regards to physical traceability.”

MHD charging projects are in a difficult position: they are extremely capacity and energy intensive, second only to data centers in light-industrial real estate,² making them time-consuming to connect to the grid, yet they require accelerated schedules to meet fleet electrification mandates and avoid stranding EV assets. Projects in this predicament look to on-site generation with energy storage as a solution to meet fleet electrification objectives ahead of utility connections, with the added benefit of

² According to Prologis benchmarks of typical alternative uses for comparable properties

additional resiliency for critical fleet operations when the utility connection is eventually established in parallel. However, due to the exceptional energy intensity of industrial MHD charging projects on limited footprints, dispatchable power-dense on-site generation such as fuel cells or linear generators sometimes can be the only feasible technical solution that can fit the available real estate and meet the energy demand.

This important EV charging pathway for biomethane (whether RNG or hydrogen in its final delivered form for on-site generation) is not only a more energy efficient pathway for biomethane, but it also has significantly lower NOx emission profile than CNG vehicle application in sensitive disadvantaged communities around ports.³ Yet, only CNG vehicle fueling projects are incentivized with book-and-claim LCFS accounting from RNG energy sources.

As Prologis has recommended in prior comment letters, CARB should grant equitable access to biomethane book-and-claim LCFS accounting for MHD EV charging projects investing in on-site RNG/hydrogen generation that add resiliency and accelerate around transmission and distribution upgrade delays. We ask that CARB consider amending 95488.8(g)(1)(A)(2) to read as follows (changes in bold):

076.3

*"Biomethane supplied using book-and-claim accounting pursuant to section 95488.8(i)(2) and is claimed as feedstock in pathways for bio-CNG, bio-LNG, bio-L-CNG, hydrogen via steam methane reformation **or other methods**, and electricity generation for co-located EV charging;"*

Further, we suggest a revision of Section §95488.8(i)(2) to explicitly state:

*"(2) Book-and-Claim Accounting for Pipeline-Injected Biomethane Used as a Transportation Fuel or to Produce Hydrogen **or to generate Electricity**. Indirect accounting may be used for RNG used as a transportation fuel or to produce hydrogen **or to generate Electricity** for transportation purposes (including hydrogen that is used **either** in the production of a transportation fuel **or in the generation of electricity for transportation purposes**), provided the conditions set forth below are met:*

*(A) RNG injected into the common carrier pipeline in North America (and thus comingled with fossil natural gas) can be reported as dispensed as bio-CNG, bio-LNG, or bio-L-CNG, or as an input to hydrogen production, **or as an energy source for electricity generation**, without regards to physical traceability. Entities may report natural gas as RNG within only a three-quarter time span. If a quantity of RNG (and all associated environmental attributes, including a beneficial CI) is pipeline-injected in the first calendar quarter, the quantity claimed for LCFS reporting must be matched to natural gas sold in California as RNG no later than the end of the third calendar quarter. After that period is over, any unmatched RNG quantities expire for the purpose of LCFS reporting.*

*(B) Biomethane reported under fuel pathways associated with projects that break ground after December 31, 2029, injected into the common carrier pipeline, and claimed indirectly under the LCFS program for use as bio-CNG, bio-LNG, or bio-L-CNG in CNG vehicles or as an input to hydrogen production **or as an energy source for electricity generation** for transportation purposes, must demonstrate compliance with the following requirements:*

³ 0.059 gNOx/mile for a battery electric truck supported by linear generators vs. 0.317 gNOx/mile for a CNG truck per industry SME calculations provide to Prologis

076.3
cont.

*1. Starting January 1, 2041 for bio-CNG, bio-LNG and bio-LCNG pathways, and January 1, 2046 for biomethane used as an input to hydrogen production **or electricity generation**, the entity reporting biomethane must demonstrate that the pipeline or pipelines along the delivery path physically flow from the initial injection point toward the fuel dispensing facility at least 50 percent of the time on an annual basis. Entities may report natural gas as RNG within only a three-quarter time span. If a quantity of RNG (and all associated environmental attributes, including a beneficial CI) is pipeline-injected in the first calendar quarter, the quantity claimed for LCFS reporting must be matched to natural gas sold in California as RNG no later than the end of the third calendar quarter.*

After that period is over, any unmatched RNG quantities expire for the purpose of LCFS reporting.”

Prologis believes these recommendations will further enhance CARB’s proposed improvements to the LCFS program to align with the State’s transportation electrification goals and ensure they reflect the multiple use cases supporting logistics sector fleets, including both MHD-FCI Private and Shared charging, as well as address the realities of utility energization delays and resiliency risks for charging projects.

Thank you for considering our recommendations, and we welcome the opportunity to elaborate on our views with the Board and staff. Please do not hesitate to contact me at amoch@prologis.com or 571-895-5763 for more information or to discuss our comments in further detail.

Respectfully submitted,

Alexis Moch
Vice President, Government Affairs
Prologis

May 10, 2024

Dear Governor Newsom and Members of the California Air Resources Board,

The Campaign for Family Farms and the Environment is a coalition of state and national organizations, including Dakota Rural Action (South Dakota), Iowa Citizens for Community Improvement, Land Stewardship Project (Minnesota), Missouri Rural Crisis Center, Food & Water Watch and Institute for Agriculture and Trade Policy. Our organizations work together as CFFE to change policies that promote consolidation in animal agriculture at the expense of independent family farms, rural and urban economies, workers and an open, fair and competitive food system.

Unfortunately, California's Low Carbon Fuel Standard (LCFS) program is one of the policies that is doing harm to our communities.

We were shocked to see the CARB staff deliberately exclude discussion about how the LCFS is incentivizing factory farm biogas expansion in our communities during the April public workshop on the Low Carbon Fuel Standard. The workshop ignored factory farm biogas incentives despite CARB's leadership calling on staff to take the issues seriously and find just solutions, and made it clear that Governor Newsom and board members need to rein in the staff. It was deeply troubling to see CARB staff completely ignore the significant impacts of factory farm biogas on the environment, rural economies, and public health despite years of effort by our communities and many others to raise the alarm about why expanding the use of digesters for factory farm waste is a false climate solution that does real harm to communities around the country.

The push to build digester infrastructure around the country, that is fueled in large part by California's LCFS incentives, is exacerbating damaging trends of consolidation and increased corporate control of the food system that have already wreaked havoc on independent family farms and rural economies. The investment of huge amounts of public money into manure digesters is propping up the largest industrialized livestock operations, and causing them to expand. Subsidies from the LCFS allow these large corporate-controlled operations to survive low commodity prices with funding from manure-derived biogas that small operations cannot access.

Our members have witnessed the shift in the structure of the livestock sector away from independent diversified farms to industrialized animal feeding operations in their communities. These factory farms concentrate animals and their waste, burdening surrounding communities with air and water pollution. Around the country, neighbors of these facilities report odors and other health impacts, and losing the ability to spend time outdoors. Anaerobic digesters are touted by the industry as a win-win solution that creates usable energy while reducing the environmental impact from the management of massive quantities of manure. But communities around the country know that this technology is far from a real solution. Instead,

digesters allow factory farms to not only remain a burden on surrounding communities, but often to grow even larger.

Unfortunately, California's preference for manure-derived biogas in the LCFS program is driving the expansion and entrenchment of factory farms and dirty biogas projects farm beyond California, including into our communities. The current flaws in the LCFS, such as "avoided methane crediting" and inaccurate life cycle assessments, not only enable pollution but disproportionately harm low-income communities and communities of color who live near factory farms and manure digesters. This is in stark contrast to the environmental justice commitment set by California.

077.2 cont. CFFE believes that climate change is a serious challenge that requires a dramatic response. This crisis demands more than highly speculative market-based schemes that will allow polluters to keep polluting and let agribusiness pay farmers less for their crops and livestock. A serious plan to address agriculture and climate change must address structural issues, not just attempt minor improvements in environmental performance in a highly consolidated, industrialized factory farm system. Factory farms require huge quantities of feed, water, chemical inputs and energy and manage manure in a way that drives greenhouse gas emissions. California's climate programs must support a dramatic transition in how we raise animals for food that is centered on independent family farms and sustainably managed grazing systems.

Using California's climate programs, including the LCFS, to support expensive manure management projects on confinement operations fails to make this necessary structural change, and instead props up and expands the factory farm system. Prioritizing grazing over factory farm manure management would increase the sequestration of carbon in pastures, and also avoid the emissions from industrialized animal operations' feed production and liquid manure storage. Manure lagoons not only emit high amounts of methane and nitrous oxide, but they are also highly vulnerable to natural disasters such as hurricanes and floods. And confinement operations decouple grazing animals from grasslands, requiring more synthetic fertilizers for feed production, which drives further emissions.

Factory farm biogas production poses grave environmental, public health and economic risks, yet CARB staff chose to ignore this environmental injustice. This is unacceptable and undermines CARB's credibility as a regulatory body.

As we have articulated in previous comments, CARB must change its approach to manure-biogas and:

- 077.3 • Eliminate "avoided methane crediting"
- 077.4 • Address inaccuracies in the Life Cycle Assessment that ignore associated up and downstream greenhouse gas emissions from factory farm gas production

- 077.5 • Evaluate not only the risks of increased ammonia emissions and water pollution from disposal of digestate, but also the potential that the contract will lead to an increase in the total number or density of livestock raised on the site
- 077.6 • Remove the 10-year "grace period" for factory farm gas producers
- 077.7 • Stop double counting by allowing factory farm gas projects paid for and claimed by other programs to sell LCFS credits as well.

077.2 cont. The LCFS may be a California policy, but it is driving the expansion and entrenchment of factory farms and dirty biogas projects far beyond California, including in our communities in the Midwest. In addition to concerns about our communities in the Midwest, we stand with the impacted communities in California's Central Valley who are disproportionately impacted by the public health burdens of digesters that extend the life of massive dairy factory farms.

CFFE urges board members to rein in CARB staff and ensure that the LCFS stops incentivizing harmful factory farm biogas production in California and beyond.

Sincerely,

Campaign for Family Farms and the Environment



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May 10, 2024

VIA ELECTRONIC FILING
Submitted via LCFS Comments Upload Link

The Honorable Liane M. Randolph, Chair
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Gevo, Inc.'s Comments on the Low Carbon Fuel Standard Workshop, April 10, 2024

Dear Chair Randolph:

Gevo, Inc. (Gevo) appreciates this opportunity to comment on the April 10, 2024, Workshop held by the California Air Resources Board (CARB) on the Proposed Amendments to the Low Carbon Fuel Standard (LCFS) and additional information CARB shared in the Workshop process.

Gevo's mission is to produce low-carbon, renewable energy-dense liquid hydrocarbons for drop-in transportation fuels such as gasoline, jet fuel, and diesel. Gevo's alcohol-to-hydrocarbons production process uses a combination of decarbonization technologies and sustainably farmed feedstock to produce fuels with substantially reduced carbon intensity (CI) compared to fossil fuel equivalents. We broke ground on our first alternative jet fuel (AJF)/sustainable aviation fuel (SAF)¹ production facility, "Gevo Net-Zero 1" (NZ1), in Lake Preston, South Dakota, in September 2022. This facility will use a three-part strategy to produce low-CI SAF: 1) use locally-sourced corn feedstock from farmers engaged in sustainable agriculture to both reduce on-farm greenhouse gas (GHG) emissions and sequester carbon dioxide (CO₂) in the soil; 2) decarbonize the fuel production process by replacing conventional fossil fuel inputs with wind energy, renewable natural gas, and green hydrogen; and 3) use carbon capture and sequestration (CCS) technology to reduce emissions from the production process

¹ Gevo typically uses the term "sustainable aviation fuel" or "SAF" to refer to our fuel. This fuel meets the definition of "alternative jet fuel" (AJF) as set forth in the LCFS regulations. Accordingly, our references to SAF in this comment letter should be deemed synonymous with AJF.

further. The Gevo approach is aimed at decarbonizing every step in our SAF's life cycle, which we track all the way from the farm field through to the aircraft using our Verity Tracking platform.

Gevo currently is participating in the LCFS through our production of renewable natural gas (RNG) from three dairies, for which we installed dairy-manure biomethane capture and upgrading equipment, thereby producing pipeline quality RNG rather than allowing the methane from the manure to continue to be released from the dairy lots. In addition, we intend to submit a Tier 2 LCFS Provisional Pathway application for the SAF, renewable diesel, and renewable naphtha fuels that will be produced at the NZ1 facility, utilizing our field corn starch feedstock and alcohol-to-jet (ATJ)/alcohol-to-hydrocarbons production process.

Gevo submitted comments on CARB's proposed LCFS amendments on February 20, 2024, and we incorporate those comments here by reference.² Although we continue to urge CARB's consideration of all of the comments we submitted on February 20, the comments here relate to areas elaborated in the April 10 Workshop by CARB staff and other commenters and in the materials CARB provided in support of that Workshop.

I. Gevo Supports Strengthening the Compliance Curve, Step Down, and Automatic Acceleration Mechanism

As noted in our February 20 comments, Gevo strongly supports CARB's intent to strengthen the overall compliance curve. CARB's analysis clearly shows that this is needed to support California's emission goals. However, as we noted in our comments the analysis undertaken and submitted by ICF demonstrated that CARB could go even farther, as ICF's LCFS analysis found that a 2030 target for the program greater than 40% is achievable when all low carbon fuels are allowed to contribute fully under the program's technology-neutral, performance-based design.³ Thus, while supporting CARB's benchmarks/compliance curve proposal, we urged CARB to view the proposed targets as a minimum, and to continue to consider ways to further advance emissions reduction through LCFS emissions targets.

² See Gevo, Inc.'s Comments on "Proposed Amendments to the Low Carbon Fuel Standard" (February 20, 2024) (available as Comment #196 in CARB's Public Comments Received portal).

³ ICF's prior analysis, captured in the report, "Analyzing Future Low Carbon Fuel Targets in California," was previously submitted to CARB by the Low Carbon Fuels Coalition. See Letter from the Low Carbon Fuel Coalition to CARB Chair, Liane Randolph (Sept. 28, 2023) (attaching the ICF report).

In addition, while supporting CARB's proposals for a CI stepdown and for adoption of an Automatic Acceleration Mechanism (AAM), we urged CARB to consider a significantly greater stepdown than the 5% that had been proposed and to further strengthen the AAM.

Gevo appreciates CARB's effort to analyze additional compliance curve, stepdown, and AAM combinations. Based on our review of the additional data that CARB provided, it appears that the 5% and 7% stepdown options would be insufficient to address the excess credit buildup in the bank that weakens the effectiveness of the LCFS, even if these stepdowns were accompanied with an AAM trigger (and even if the 5% stepdown were to be coupled with two AAM triggers). In assessing the ICF and CARB analyses side-by-side, Gevo continues to urge CARB to consider a stepdown of 10-11% in 2025, which is supported by the ICF analysis as we detailed in our previous comments.⁴ That said, of the options CARB has assessed, the 9% stepdown appears to be the most viable, as such a stepdown is projected to result in credits closer to the demand to be sparked by the compliance curve rather than allowing the credit bank to continue to build to excess. Accordingly, Gevo urges CARB to adopt a stepdown of not less than 9%, though a 10-11% stepdown is supportable and warranted based on the analysis, and we continue to support the adoption of the AAM to serve as a safeguard that could be triggered in case market conditions again hew to an excessive credit bank and/or depressed credit values that could undermine the emissions-reducing effect of the LCFS.

II. Further Support Should Be Provided for Alcohol-to-Hydrocarbons in the LCFS Revisions

In various places in the proposed regulations, CARB proposes to enumerate certain feedstocks and/or production processes, rather than retain the feedstock- and technology-neutral approach that has typically been taken under the LCFS. Although CARB staff did not further elaborate on these proposed changes during the Workshop, staff did note an overall intent for the LCFS to remain focused on performance, rather than on specific technologies or feedstocks. Thus, we reiterate here the areas where the proposed LCFS revisions appear contrary to this intent, with specific respect to our concern that CARB's proposed changes would create unnecessary administrative and other barriers to low-carbon fuels from the alcohol-to-hydrocarbons/ATJ pathways.

- 078.2
- Temporary Alternative Jet Fuel Pathways Should Include a Specific Corn Starch ATJ Pathway (§95488.9(b)): As noted in our February 20 comments, Gevo strongly

⁴ As we laid out in our February 20 comments, ICF's analysis demonstrates that "a stepdown of at least 10.5% in 2025 likely is needed to ensure that the credit bank reverses and is drawn down to the level necessary to continue to incentivize LCFS-driven emissions reductions, i.e., with the credit bank holding approximately two to three quarters' worth of deficits."

supports CARB's proposal to include alternative jet fuel (i.e., SAF) temporary pathways in Table 8. We respectfully request that CARB expand the ATJ temporary pathways to include corn starch feedstock processed using an alcohol-to-hydrocarbon production process. As Gevo detailed in our February 20 comments, the alcohol-to-hydrocarbon pathway is well established, with multiple ATJ/SAF facilities using this production process coming online. Inclusion of the corn starch feedstock to alcohol-to-hydrocarbon process as a temporary ATJ pathway will further incentivize its production, helping to meet the State's emissions reduction goals and will avoid the delay that would be occasioned by deferring its addition until later. We note the concern that, as currently stated, the ATJ temporary pathway proposal in the current LCFS package would put corn starch feedstock pathways in the "any other feedstock" category with a "Baseline (2010) CI value for Fossil Jet Fuel." Similar to the July 31, 2019, proposal for ATJ temporary pathways (which also happened to artificially align the corn starch and "any other" non-enumerated ATJ feedstock pathways with the renewable diesel pathway),⁵ the proposed catch-all temporary pathway designation in the current LCFS proposal would not reflect the significant CI reduction associated with the actual lifecycle analysis of the corn starch ATJ pathway.

078.3

- The Proposed Revision of the Definition of "Renewable Diesel" and the Proposed Definition of "Renewable Naphtha" Should Not Be Limited in Terms of Feedstocks or Pathways (§95481(a)): CARB's proposals would import specific feedstocks and production pathways (i.e., hydrotreated lipids and biocrudes or from gasified biomass that is converted using the Fischer-Tropsch process and portions from co-processing) into these definitions. As written, the proposed definitions would presumably exclude feedstocks and production pathways that are not enumerated. If so, our production process – the alcohol-to-hydrocarbons conversion process – apparently would be excluded from these definitions, as would our feedstock, corn starch (or other such biomass not expressly included in the proposed definitions). Yet, renewable diesel and renewable naphtha are hydrocarbon fuels that are produced alongside our SAF (i.e., alternative jet fuel) in alcohol-to-hydrocarbons production facilities. There is no rational reason for excluding such truly renewable naphtha and diesel from the CA-LCFS program and by enumerating specific technologies and feedstocks (and in this case, so few), CARB would be creating an administrative barrier to the types of innovations the State wants to encourage. Accordingly, we urge CARB to make these definitions neutral as to non-petroleum feedstocks and production processes.

⁵ See CARB, Low Carbon Fuel Standard Proposed New Temporary Fuel Pathway, Alternative Jet Fuel (July 31, 2019).

078.4

- **CARB Should Expressly Include Alcohol-to-Hydrocarbons in the Tier 2 Classification Provisions (§95488.1(d)(4)):** While Gevo understands that the Tier 2 pathway classification is not limited to the production processes listed in this section of the proposed regulation, we are concerned that the omission of the alcohol-to-hydrocarbon conversion process might be misread as an exclusion. Therefore, as noted in our February 20 comments, we suggest that CARB revise the language associated with Tier 2 classification to explicitly mention alcohol-to-hydrocarbon conversion technology, as follows (proposed addition underlined and bolded, while the strikethroughs are in CARB's proposal):

*(4) Drop-in fuels (renewable biomass-derived hydrocarbons using processes such as gasification and pyrolysis, synthetic hydrocarbons, **and alcohol to hydrocarbon conversion**) except for renewable diesel hydrocarbon fuels produced from feedstocks described in section 95488.1(c)(3). This category includes fuels produced from low carbon feedstocks co-processed with fossil feedstocks in petroleum refineries;*

078.5

III. The LCFS Should Continue to Support and Credit Avoided Methane Projects, Including from Dairy RNG

Gevo appreciated CARB staff's comments during the April 10 Workshop in support of RNG crediting and responding to opposing comments on dairy and other forms of RNG. Gevo strongly supports avoided methane crediting recognizing RNG project benefits that reduce global methane emissions regardless of location or end use. This should include avoided methane from dairy-manure RNG projects. As noted, Gevo participates in the LCFS via the RNG captured from three dairies, for which we installed dairy-manure biomethane capture and upgrading equipment, thereby producing pipeline quality RNG rather than allowing the methane from the manure to continue to be released to atmosphere. LCFS policies create incentives for dairy farmers to capture methane emissions from their cows to convert into biogas. As CARB has recognized, "capturing methane from dairies is one of the primary measures for achieving the state's 2045 greenhouse gas reduction targets and SB 1383 methane reduction target."⁶

⁶ California Air Resources Board, "Proposed Amendments to the Low Carbon Fuel Standard Initial Statement of Reasons," Dec. 19, 2023, at page 124.

And use of dairy digesters creates synergistic environmental benefits, as farmers can generate soil amendments that provide nutrients and decrease the amount of fertilizer needed.⁷

In our February 20 comments on the LCFS proposal, Gevo supported CARB's proposal to continue avoided methane crediting, including for dairy RNG, but we noted areas where the LCFS proposal should be further shaped to meet the State's greenhouse gas emissions goals. Gevo commends CARB to our full set of comments, but provides a brief summary of key points here:

- 078.6
- The requirement for physical delivery of biogas or biomethane, i.e., RNG, to a production facility proposed in section 95488.8(i)(2)(C)(2) would add significant cost burden and environmental impact as truck transport of RNG apparently would be required to decarbonize thermal energy. In addition to unduly burdening RNG suppliers like Gevo, it would be counterproductive to the State's emissions reduction goals. To avoid these results, we encourage CARB to allow for biogas or biomethane to be supplied as process energy using the book-and-claim provisions under the regulation. This would bring the CA-LCFS into alignment with the recent changes in the Renewable Fuel Standard (RFS) Biogas Regulatory Reform – which now allows for biogas to be delivered via commercial natural gas pipelines and used to decarbonize thermal demands. Such an approach encourages future GHG emitting projects to be leveraged at production facilities to lower fuels' carbon intensities and expands the understanding that natural gas in pipeline systems is fungible.
- 078.7
- Gevo urges CARB to continue to expand book-and-claim and deliverability requirements within the LCFS in general, and to not place book-and-claim (or other) restrictions on biomethane projects. CARB's proposals in the LCFS package that would place restrictions on biomethane projects risk the LCFS program's ability to decarbonize through biomethane projects. In particular, Gevo opposes CARB's proposal for biomethane projects breaking ground after December 31, 2029, which would mandate that "[s]tarting January 1, 2041...the entity...must demonstrate that the...pipelines along the delivery path physically flow from the initial injection point toward the fuel dispensing facility at least 50 percent of the time on an annual basis." Instead of singling out certain biomethane projects for such restrictions, Gevo supports consistency in LCFS pathways and believes biomethane projects be evaluated and credited on the science-based merits of GHG emissions reduction, rather than the project location or directionality of biomethane flow in U.S. pipelines.

⁷ See, e.g., University of California, Agriculture and Natural Resources, "California Dairy Farmers Generate Renewable Energy from Waste," (Nov. 3, 2023) available at <https://ucanr.edu/News/?postnum=58234&routeName=newsstory>.

Gevo's support in this regard is consistent with CARB's newly developed CCS pathways that aren't restrictive to project location or pipeline directionality.

- 078.8
- As we noted in our February 20 comments, Gevo supports a credit true up in the LCFS program for all pathways – including for dairy RNG – and we urge CARB to also include true ups between temporary pathways and provisional pathways. We note that the RNG temporary pathway score of -150 CI for swine and dairy manure biomethane projects is more than 50% higher than the actual CI of Gevo's operating facility. Provisional pathways undergo the same rigorous validation and verification process as for operational pathways. By allowing "true ups" between temporary and provisional CI's, CARB would allow operators like Gevo to be credited for the entirety of their projects and the real-world climate value these projects bring, thereby supporting and promoting investment in climate mitigating projects and advancing California's emissions reduction efforts.

- 079.9
- Gevo reasserts our concerns regarding the proposed changes to the "Retention Time and Drainage" instructions under the "Biomethane from Anaerobic Digestion of Dairy and Swine Manure" Tier 1 calculator. Currently, an applicant can select from the options that are applicable to their farms in the "Manure-to-Biogas (LOP Inputs)" tab without having to select a particular month where the system is completely emptied. CARB has now proposed a standardized requirement that: "If there is no regular storage/treatment system clean schedule, must select 'System Emptied in This Month' each September. The applicant only needs to select one 'System Emptied in This Month' for each year." While Gevo appreciates what we perceive to be CARB's approach to standardize the Tier 1 Calculator's inputs for swift processing, we are concerned that by setting this specific "System Emptied" timeframe, this requirement can result in a forced increase in the CI of a project, causing a penalty to farms that retain a certain level of volatiles in their storage system throughout the year. Accordingly, we urge CARB to retain the current approach rather than adopting this amendment. In any event, although the proposal appears to seek to standardize, and only apply to, Tier 1 applications, to the extent CARB proceeds with the proposed change, we respectfully request that CARB continue to assess site-specific optionality in Tier 2 applications. This will ensure unnecessary penalties aren't assessed for farm-specific circumstances in which the farm does not completely empty their storage systems in any year.

078.10

IV. Gevo Is Committed to Strong Sustainability and Tracking Requirements, but Urges Further Consideration of the Crop-Based Sustainability Provisions Proposal

During the Workshop, CARB repeated that its main objective in proposing sustainability certification for fuels that use crop-based (and wood-based) feedstocks is to ensure

"biofuel production must not come at the expense of deforestation or food production."⁸ While Gevo is fully committed to providing low-carbon, sustainable SAF, without compromising these critical values, as we noted in our February 20 comments, we respectfully submit that CARB's sustainability certification proposal is not fit for purpose and we again urge CARB to convene a stakeholder process to flesh out an appropriately tailored approach to sustainability certifications for feedstocks that would include crediting the emissions reductions from climate-smart agriculture.

Climate-smart agriculture is an important lever for carbon abatement. As noted, Gevo plans to source sustainably-grown, low-carbon intensity (CI) field corn from the Lake Preston, South Dakota area and use Verity Tracking to measure and verify carbon intensity and all farm activities to the field level. The Gevo Growers' Program is currently enrolling farmers under our \$30 million USDA Climate-Smart Commodities grant, which allows us to pay farmers more for implementing climate-smart agriculture practices such as cover crops, reduced tillage, organic fertilizers, and nutrient management. Notably, our process only uses the residual starch from the corn, first ensuring that the protein goes to food and feed uses.

Climate-smart agricultural practices are critical to producing sustainable feedstock. In addition to sequestering carbon in soil, they provide significant additional ecosystem benefits such as better soil health, better water quality, higher water use efficiency, more resilient crops, and long-term land fertility. These practices are a significant component of Gevo's approach to sustainable SAF and other low-carbon fuels production and we urge CARB to support them under the LCFS.

078.10 contd Gevo supports and is committed to fully meeting appropriate sustainability criteria. Unfortunately, what CARB has proposed misses the mark. CARB has failed to fully define the problem it purportedly is trying to solve and, relatedly, has failed to provide an appropriately defined solution. In terms of defining the problem, virtually all the data CARB presented at the Workshop about the potential for crop-based feedstocks to negatively affect food and forests discussed crop-based oil seeds and virgin oil. In fact, there is no mention of corn starch feedstock creating impacts of concern in the slides presented by CARB.⁹ Notably, the corn starch feedstock that Gevo uses is distinguishable from oil seed and plant oil feedstocks. U.S. corn production has long had multiple uses in food, feed, and fuel and has not resulted in increased land use, nor has

⁸ This intent was restated in the slide deck presented by CARB at the Workshop, "California Low Carbon Fuel Standard Workshop, April 10, 2024," at slide number 51 (hereinafter "CARB Workshop Slide Deck").

⁹ CARB Workshop Slide Deck, at slides 52-56.

it negatively affected food prices.¹⁰ Since 1920, U.S. farmers have increased their yield by approximately 140 bushels of corn per acre while reducing agriculture's land footprint by 9% nationwide.¹¹ Indeed, leveraging existing agricultural land, regenerative agriculture practices, and clean energy to produce both feed and fuel from the same crop while sequestering carbon throughout the production process maximizes land use efficiency and carbon abatement. Making multiple products from one crop is an efficient, sustainable use of cropland and better for our environment.

As confirmed by CARB staff during the April 10 Workshop, CARB has not set out specific sustainability requirements that it would expect to be met, instead deferring to third-party schemes. CARB's failure to set out specific requirements calls into question not only what problem CARB is trying to solve, but also how one might comply. It also raises the question of whether CARB has the legal and regulatory authority to import into the LCFS undefined substantive provisions within outside schemes.

078.10 contd Indeed, the provisions proposed are too vague to be implemented appropriately and consistently across production facilities and by various certification bodies. For example, the provision that "the certification must consider environmental, social, and economic criteria" could be interpreted in a variety of ways. It is unclear from the proposed language which specific environmental, social, and economic criteria would be deemed essential for the CA-LCFS program and how they might align with program goals. Further, CARB's failure to establish clear criteria calls into question why the current analytical, science-based methodologies used by CARB are assumed to be insufficient to provide the necessary controls on crop-based (and forestry) feedstocks to ensure environmental integrity. Moreover, given that CARB only detailed potential concerns about oil seed crops during the April 10 Workshop, there does not appear to be a basis for the broad application of the proposed sustainability certification requirements to all low-carbon fuels that use any form of crop-based feedstock.

In addition, it is unclear why crop and forestry-based fuels are being singled out for meeting social and economic criteria, which have implications for any fuel pathway participating in the program. These additional criteria have the potential to add substantial administrative burden to both farmers and fuel producers, potentially

¹⁰ See Oladosu, Gbadebo & Kline, Keith & Langeveld, "Structural Break and Causal Analyses of U.S. Corn Use for Ethanol and Other Corn Market Variables," *Agriculture*. 11. 267. 10.3390/agriculture11030267 (2021) ("The casualty analysis finds that U.S. corn use for ethanol is not a driver of corn price and net corn exports.") See also Taheripour, Baumes & Tyner, "Economic Impacts of the U.S. Renewable Fuel Standard: An Ex-Post Evaluation," *Front. Energy Res., Sec. Sustainable Energy Systems* Volume 10 (2022) ("The long-run effects of biofuel production and policy on food prices were negligible... biofuels' contribution to commodity price increases is really no different from fructose corn syrup, increased feed demands, or other market demands.")

¹¹ See USDA, "Crop Production Historical Track Records."

creating barriers to participation in the LCFS, and as such should be carefully considered in the context of what the program hopes to achieve with these criteria.

During the April 10 Workshop, CARB staff reiterated that its remit from the Board at the September 28, 2023, informal Board meeting with regard to crop-based fuels was to “investigate guardrails.”¹² It does not appear that CARB staff has done that, instead – as noted – simply deferring to third-party sustainability certification schemes without determining what might or might not be needed for the State. Although the proposed LCFS regulatory revisions do not cite specific third-party schemes, during the workshop CARB staff referred to the Roundtable on Sustainable Biomaterials (RSB) and the International Sustainability and Carbon Certification (ISCC) initiative as the types of certification systems it believed would be applicable.

While Gevo is a member of and we work with both RSB and ISCC, in our experience, despite being well intentioned regarding stakeholder input, these entities have not actively included farmers in the development of standards and, as European certification bodies, do not have first-hand experience with U.S. agriculture. Also, both of these entities have multiple certification standards – yet CARB has not provided sufficient detail to suggest which might be applied.

078.10 contd To better meet the CARB Board remit that CARB staff “explore guardrails,” we implore CARB to remove the sustainability certification requirement from the rulemaking and continue to mature the development of specific program requirements with multi-stakeholder input and workshop feedback to align whatever substantive requirements CARB might impose with specific LCFS goals and to make the provisions practicable. Critically, this stakeholder input must bring farmers and others who work in agriculture to the table, as farmers are more often than not omitted from the development of program standards, despite being the most critical actors in implementation of those standards.

078.11 Critically, in establishing specific sustainability criteria that are expected to be met for crop-based feedstocks, CARB should include provisions that allow for climate-smart agriculture practices to be credited under the LCFS. These practices represent significant additional effort on the part of the farmer to implement and are a departure from business-as-usual feedstock production. Moreover, these practices can bring significant GHG emissions reductions, as recognized by the U.S. Department of

¹² CARB Workshop Slide Deck, at slide 51.

Agriculture, the National Academy of Sciences, the IPCC, and others.¹³¹⁴¹⁵ Hence, they should be incentivized through crediting to drive adoption of these important practices.

By focusing in on what the State of California seeks to achieve through additional sustainability criteria, and delineating those criteria with appropriate inputs, CARB can ensure that program requirements are fit for purpose, clear, transparent, applied fairly across feedstocks and fuel production processes, properly credit GHG emissions reductions from agricultural feedstocks, and align with LCFS-specific program goals. And such a process need not take long, as CARB could set up a process with a specified time frame (e.g., six months) as it has in other instances where program requirements need to be refined.

V. Conclusion

Thank you for the opportunity to comment on the April 10 Workshop addressing issues in the Proposed Amendments to the Low Carbon Fuel Standard. Please let us know if you have any questions regarding our comments. We look forward to continuing to participate in this program with our RNG and as Gevo begins commercial scale production of SAF and other biofuels.

Respectfully,



Kent Hartwig
Director of State Government Affairs
Gevo, Inc.



Nancy N. Young
Chief Sustainability Officer
Gevo, Inc.

¹³ J. Rosenfeld, J. Lewandrowski, T. Hendrickson, K. Jaglo, K. Moffroid, and D. Pape, 2018. A Life-Cycle Analysis of the Greenhouse Gas Emissions from Corn-Based Ethanol. Report prepared by ICF under USDA Contract No. AG-3142-D-17-0161. September 5, 2018.

¹⁴ National Academies of Sciences, Engineering, and Medicine. 2019. Negative Emissions Technologies and Reliable Sequestration: A Research Agenda. Washington, DC: The National Academies Press. doi: <https://doi.org/10.17226/25259>.

¹⁵ Nabuurs, G-J., R. Mrabet, A. Abu Hatab, M. Bustamante, H. Clark, P. Havlík, J. House, C. Mbow, K.N. Ninan, A. Popp, S. Roe, B. Sohngen, S. Towprayoon, 2022: Agriculture, Forestry and Other Land Uses (AFOLU). In IPCC, 2022: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)). Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926.009.



May 10, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: April 10, 2024 California Low Carbon Fuel Standard Workshop

Dear California Air Resources Board,

Braya Renewable Fuels (Newfoundland) LP (“Braya”) is the owner of the Come By Chance refinery in Newfoundland, Canada. Braya recently completed the conversion of the idled conventional oil refinery to renewable diesel and sustainable aviation fuel production. The refinery is strategically located to source a variety of low-carbon intensity feedstocks and deliver fuels to various end markets, including California, to help meet LCFS demand and California’s broader greenhouse gas initiatives. Renewable diesel and sustainable aviation fuels help decarbonize sectors—heavy transport and aviation—that are key to economic activity and have few other near-term, executable decarbonization solutions.

CARB’s successful LCFS program has attracted global attention and has inspired other states and nations with its market-based principles, scientific basis, and feedstock- and technology-neutral approach. The LCFS has exceeded expectations, is over-performing, and is becoming increasingly diverse in approaches that serve to reduce and replace fossil fuels as part of its decarbonization efforts. The LCFS has made meaningful investments in low-carbon fuels a reality - Braya’s conversion of a conventional crude oil refinery to biofuels is a perfect example of achieving that goal.

We appreciate the opportunity to provide the feedback you requested during the April 10, 2024, Low Carbon Fuel Standard Workshop. We would also like to congratulate the CARB staff on handling a very long day and a difficult job well done.

Braya Opposes Artificial Cap on Vegetable Oil Feedstocks

079.1

We agree with CARB’s position that an artificial cap or immediate phase-out of crop-based biofuels would be detrimental to the goals of the LCFS program. CARB acknowledged that Internal Combustion Engines will be around for decades, that harder-to-electrify engines in heavy-duty trucks, aviation, and marine applications require near-term solutions, and that liquid biofuels play a vital role during the transition to electrification. Further, the infrastructure required for wholesale electrification will be an extremely capital and time-intensive endeavor. As a result, alternative fuels must be used as a bridge to this electrification goal, and the LCFS structure should support this bridge. During this time, lipid feedstocks are required to supply the large volumes of low-carbon intensity fuels needed to displace their petroleum-based counterparts. Without these fuels, demand for fossil fuels will increase significantly with inadequate viable alternatives.

079.2

Contrary to the presentation by the Environmental Justice Advisory Committee, the overwhelming evidence shows that CARB’s approach to biofuels does not contribute to deforestation. As presented in

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cont.

our previous comments in response to the November 2022 and February 2023 workshops, a number of reputable studies have concluded that lipid-based feedstocks for biofuels do not impact food resources or cause deforestation and damaging land conversion. At present, crop-based feedstocks are needed to spur continued growth and investment in renewable diesel and sustainable aviation fuels, which are key solutions for decarbonizing the heavy transport, marine, and aviation sectors for the foreseeable future.

079.3

In our response submitted in December 2022, we provided evidence and a study conducted in November 2021 by LMC International (“LMC”) and commissioned by the Advanced Biofuels Association (ABFA), identifying global lipid demand from all sources and all end-users and the fact that the current crop-based feedstock supply exceeds biofuels’ forecast demand through 2030 while still meeting the demand for non-biofuel use. Further, the study assumed a maximum use of lipid-based feedstock for biofuels even though advances are being made regarding the use of wastes, starches, algae, and biomass, which will provide alternative feedstock supplies and naturally lower the demand for crop-based biofuels. The summary slides and 2030 conclusions can be found here: <https://advancedbiofuelsassociation.com/study-shows-available-advanced-biofuels-feedstocks-can-pace-biofuel-demand-through-2030/>.

Following the February 2023 workshop, Braya submitted additional relevant data in our responses in March 2023, utilizing the same scientific approach and presenting a Short-Term Outlook through 2025 developed by LMC in February 2023 (the “LMC Report”) in response to an updated request by the ABFA. The LMC Report identified a number of events that have occurred globally and have positively impacted the amount of available crop-based and lipid feedstocks. The LMC Report presents compelling evidence that the supply of fats, oils, and greases (FOG), as well as soybean and canola, have all increased and will continue to do so at no detriment to increased global demand or at the expense of the environment or society due to land use change. The LMC Report is located in Appendix 1 on Page 11 of the ABFA’s response to the EPA Set Rule on its website at the following location: <https://advancedbiofuelsassociation.com/wp-content/uploads/2023/02/ABFA-2023-Set-Rule-Comments-Final.pdf>.

079.3
cont.

Braya was pleased to see additional language in CARB’s April 10th presentation linking a number of the global factors referenced in the LMC Report to the increase in oil prices in 2021 and 2022, citing the USDA and the UN Food and Agriculture Organization. We were also pleased to hear concurrence with our own stance that soy oil also has the potential to lower both petroleum prices and meat prices. Also of note were CARB’s own comments and data concerning the fact that over 2.5 million tons of virgin oil can be used over waste oil at the same price, further enabling CARB to meet its goals while advances are being made on the electrification front. It is a simple issue of scarcity. Braya believes the supply of traceable and documented FOG feedstock will continue to be limited, and crop-based feedstocks will be required to fulfill CARB’s goals.

079.4

We re-emphasize that time and investment are still needed to continue growing the supply of second-generation biofuels. The efforts are underway, but the continued support of the LCFS will help make this goal a reality. To date, the LCFS has maintained an unbiased, technology-neutral approach, allowing the program to evolve naturally, without picking winners and losers, which has been a key to CARB’s success.

079.5

CARB already has a stringent and ongoing review process in place to address indirect land use change (“iLUC”) applicable to biofuel incentives. This mechanism significantly penalizes producers that utilize crop-based feedstocks by elevating CI scores well above those of non-crop-based feedstocks. A

079.6 prohibition on crop-based feedstocks will increase costs across the board, including to end-use consumers, and stifle investment in the vital expansion of renewable diesel and sustainable aviation fuel supply that would otherwise continue as CARB strives to meet its electrification goals.

079.7 As noted by CARB during the April 2024 workshop, biomass-based diesel is a major contributor to the LCFS program, and Braya agrees that, provided appropriate incentives are in place, these volumes will continue to grow as a decarbonization method. Some experts project that North American biomass-based diesel production capacity will exceed 8 billion gallons by 2025. This growth, however, is contingent on adequate access to economic feedstocks. Artificially limiting crop-based feedstocks will likely jeopardize a significant portion of biomass-based diesel volumes that would otherwise be available to decarbonize the diesel pool. Instead, Braya believes that documentation and traceability based on actual feedstock data, including iLUC, is a more appropriate and accurate method of achieving meaningful CI reductions without jeopardizing needed renewable diesel growth.

079.8

Braya Supports Appropriate Guardrails and Sustainability Criteria for Crop-Based Biofuels

079.9 Given the importance of biofuels to CARB's mission and the dramatic increase in these biofuel volumes, we support the application of appropriately tailored sustainability criteria for the crop-based feedstocks associated with this production. Notably, crop-based biofuels represent about 60% of liquid biofuels (discounting natural gas, hydrogen, and electricity) in the years 2021 to 2023, according to the most recent [LCFS Quarterly Data Spreadsheet](#) as available through the end of the third quarter of 2023. Indeed, these same crop-based fuels represented roughly 75% of the contribution to the success of the LCFS during the years 2011 to 2021. CARB reiterated this point during the April 10, 2024 Workshop.

079.9 cont. Many other sources of feedstock are limited in quantity or can be difficult to trace back to the source of origin and are, therefore, not used at large. Advances in technology and feedstocks are being realized as evidenced by the declining relative share of crop-based fuels, but it will take time to generate significant volumes of these feedstocks as electric initiatives come to fruition. In the meantime, crop-based biofuels are critical to meeting the near-term needs of the market and to continue reducing the carbon intensity of fuels in industries that are notoriously difficult to decarbonize. In light of these realities, ensuring that the feedstocks being sourced for biofuels are truly sustainable is imperative. CARB stressed in the recent April workshop that guardrails are necessary, and Braya agrees. However, the efforts should be practical, and "prioritizing" waste oils over crop-based oils is riddled with its own set of well-publicized challenges concerning traceability and verification.

079.10

079.11 iLUC values and other upstream emissions should be accurate and updated from time to time to reflect the best available information. Traceability efforts to eliminate bad actors and detrimental situations are part of the solution. Beyond that, sustainability documentation, traceability efforts, and real evidence are practical tools to determine the most accurate iLUC and other upstream emissions values for any given feedstock. Many countries have adopted robust collection procedures and practices and have been doing so for decades to comply with other global initiatives. Jurisdictions that have not yet been developed have a wealth of resources available to assist underdeveloped programs. Countries should be encouraged to adopt these documentation practices by recognizing these efforts in the iLUC calculations.

079.12 Notably, the RFS utilizes a voluntary Quality Assurance Plan (QAP) program that would ensure that the bulk of the documentation CARB will require in respect of traceability documentation is already being collected and available. Braya is pleased to hear that new sustainability documentation requirements,

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079.13
cont. regardless of origin, are proposed to be required by January 1, 2028. In addition, the International Sustainability & Carbon Certification (“ISCC”), the Roundtable on Sustainable Biomaterials (RSB), and other schemes are already collecting documents to ensure that crop-based and forestry feedstocks are not cultivated from land that was put into production after a date that precedes CARB’s requirement of January 1, 2008. For example, Canada’s Clean Fuel Regulation now requires audited Land Use and Biodiversity declarations, and ISCC requires audited Sustainability Declarations.

079.14

Braya Supports Emission Factor Updates

The global agriculture industry has made significant investments in improved farming practices, feedstock processing, and decreased emissions at the biofuels facility level over the past decade or more. Paradoxically, the current CA-GREET3.0 model does not account for or reward these substantial improvements. Additionally, the current CA-GREET3.0 model lacks key customization features, such as not providing for specific vessel sizes (instead using wide ranges) and electricity mixes that are not representative of the various regions feeding into the LCFS. CARB has proposed to use an updated calculator CA-GREET4.0, in conjunction with the release of the new amendments, but much of the data is still woefully out of date. Specifically, the “Land Use Change” values for soy and canola oil remain unchanged at 29.1 and 14.5, respectively, as both calculators are based on a now decade-old GTAP-BIO model.

In June 2023, Floyd Vergara, former Chief and Assistant Chief in the Industrial Strategies Division and Research Division at CARB, overseeing the development of the LCFS, submitted public comments to CARB on behalf of Clean Fuels Alliance America (CFAA) and California Advanced Biofuels Alliance (CABA) in response to the May 31 and June 1, 2023, Low Carbon Fuel Standard Virtual Community Meetings: [Clean Fuels CABA Comments CA LCFS EJ Community Meetings May-June 2023](#). The evidence provided by Mr. Vergara uses the most recent updates to the Argonne National Laboratory calculators and GTAP modeling by Purdue in 2023 and conclusively shows that the iLUC scores being used by CARB in both the CA-GREET3.0 and CA-GREET4.0 models are grossly inaccurate and unfairly punitive to crop-based biofuels. Notable findings include:

- 2023 Purdue estimates for soy iLUC are 9.78 gCO₂e/MJ, compared to CARB’s 29.1 gCO₂e/MJ.
- Purdue used 4x the shock volume of 3.22 billion gallons in 2023 to achieve the 9.78 gCO₂e/MJ.
- Accordingly, CARB’s iLUC score of 29.1 for 800 million gallons is more than three times higher than the score that would result from using newer, more accurate evidence and methodologies.

We recommend updating the model used by CARB to reflect this more current and accurate data by reviewing Argonne and Purdue University’s most recent releases. Using the most recent accurate data will refute the argument that a cap on crop-based biofuels is needed. Regenerative agriculture and superior agronomic practices are being adopted globally, negating many of the arguments for limiting crop-based biofuels. Many countries, including Argentina, have been using these practices for decades on farmland that has been in place since at least the 1980s. This data is clearly shown by a number of studies, including the Organisation for Economic Co-operation and Development’s paper, [Agricultural Policies in Argentina](#). Additionally, CARB benefits from the RFS’ structure which requires evidence that crop-based feedstock must not be grown on land that was placed into production after December 19, 2007, as defined at [40CFR Part 80 §80.2 under “renewable biomass,”](#) exceeding the current requirements under the LCFS.



079.18 Finally, we support Mr. Vergara’s assertion that the use of biomass-based diesel is a significant positive factor in the health of citizens located in EJ communities, given that drop-in biofuels reduce diesel particulate matter by up to 80% in older engines, as shown in the CARB Assessment of the Emissions from the Use of Biodiesel as a Motor Vehicle Fuel in California [“Biodiesel Characterization and NOx Mitigation Study.”](#) As additional support, the CFAA engaged Trinity Consultants to prepare [a number of Health Effects Studies for CARB](#) on the positive impacts of using drop-in biomass-based diesel in place of petroleum diesel. Of note are the “immediate community health improvements that can be measured in reduced medical costs and health care burdens” and estimates that switching to biomass-based diesel could result in the prevention of “over 900 premature deaths per year, hundreds of thousands of asthma cases reduced or avoided per year, and reducing over 100,000 work loss days per year, totaling \$7 billion dollars per year in avoided health costs.”

Braya Supports Efforts to Swiftly Address the Impacts of Aircraft and Marine Vessels

Regarding disadvantaged communities and the discussions and heartbreaking testimonials throughout the April 10th workshop concerning airport and harbor employees and nearby residents, CARB should consider including the following recommendations as soon as possible in this and future rulemakings.

079.19 Several commenters indicated that the use of Alternative Jet Fuel (AJF) for intrastate flights as currently proposed is insufficient, representing a mere 10% of jet fuel emissions in California. Other commenters insisted that the airlines will not take action unless forced to do so. Eliminating the exemption for intrastate flights only is simply not enough when the bulk of emissions are produced by interstate flights. CARB staff should look to the International Civil Aviation Organization (ICAO) and the U.S. Department of Energy (DOE) as resources to determine how best to deploy and monitor such measures.

079.20 Understanding that there is not enough time to deploy immediately, reducing marine fuel emissions also needs to be a high priority. The U.S. and Canada have already started taking steps toward decarbonizing this sector. We look forward to the opportunity to work together with CARB staff to help make this a reality.

Braya Supports Credit True-Ups for Temporary Pathways

079.21 Braya applauds CARB for moving forward with the credit true-up for Tier 1 and Tier 2 pathways and is supportive of implementing a credit true-up for temporary pathways. Temporary pathways are inherently conservative CI scores; the longer a producer’s facility-specific CIs are under review, the greater the expected loss of revenue that can be so vital at the start of operations. A true-up based on facility-specific production data will not only support new biofuel producers but will also provide more accurate data for CARB to measure the program’s success in decreasing GHG emissions.

Similar to many other producers, Braya is constantly evaluating further capital projects to increase efficiencies and lower emissions. A true-up that would allow credit generators to be rewarded for reducing their CI scores over time would encourage these proactive and environmentally friendly projects.

079.22 Finally, we believe that CARB should synchronize efforts with other agencies to utilize data and precedents to streamline processes. Doing so would be of significant value, both to increase access to new pathways/new producers and reduce burdens on CARB’s resources and staff. For example, the EPA has a number of approved pathways based on GREET modeling for national and global feedstocks. CARB should

079.22
cont. explore whether these pathways could be leveraged to establish a wider range of temporary pathways that could be used until facility-specific pathways (based on operational data) are fully available.

Braya Supports CARB's Continued Advancement of the Standards

079.23 Using the 30% CI reduction scenario as a baseline, Braya believes the optimal approach is to implement a 9% step-down in target CIs in 2025. We believe that front-loading new CI targets will align with CARB goals and help repair credit prices that are currently significantly depressed due to a projected 27 million credit bank drawdown. Significant action is needed to support LCFS credit prices if the LCFS program is to achieve its stated goals.

079.24 As shown by CARB's modeling, the proposed Auto-Adjustment Mechanism ("AAM") has the potential to result in draconian credit drawdown scenarios. Braya believes the AAM is an important tool, but cautions that the scenarios modeled, such as the 5% CI step-down along with a double trigger of the AAM, may result in significant renewable diesel volumes being diverted away from California to other markets or even discouraging further investment in this space depending on AAM forecasted implications. While Braya supports the development of tools to advance the LCFS program, we believe that a transparent step-down of CI targets, along with more updated and accurate iLUC data, is a critical path to achieving meaningful carbon intensity reductions on a timeline compatible with electrification goals and realities.

Braya Supports Streamlining and Updating the Application and Review Process for Pathway Approval

079.25 By updating and improving the existing Lookup Table and Tier 1 calculators, in addition to adding new and/or separate Tier 1 calculators, CARB will be able to focus attention on critical new feedstock sources, availability, and supply, as well as new technologies, thereby expediting approvals for new Tier 2 pathways. Braya truly appreciates all the effort the CARB staff have put into this daunting endeavor.

Braya Supports Less Intensive LCFS Verifications

CARB staff's current proposal includes a provision allowing less intensive verifications solely for electricity used as a transportation fuel by permitting verification bodies to skip site visits so long as they have visited the site within the last two (2) years and have issued a positive verification statement. CARB's rationale included:

- "[T]here is little change of operation from reporting period to reporting period thus reducing the benefit of annual site visits."
- "There is no or little risk to the integrity of the LCFS program to allow for less intensive verification services without a site visit in the annual verifications for the following two years."
- "This should reduce the cost of verification services which is often passed on to program participants."

079.26 We wholly agree with CARB's statements above and believe they should apply to all validations and annual verifications for any reporting entities. In CARB's MRR program (section 95130), less intensive verification is applied without prejudice to verification services by accredited verification bodies. We agree with staff that less intensive verification leads to little to no risk to the integrity of the LCFS program and that there is little change in operation from reporting period to reporting period, while also providing cost savings to verification providers that are then passed on to program participants.



Indeed, the U.S. RFS sets a precedent whereby engineering reviews are only required every three years unless there is a material change in the facility and/or its processes. Finally, we acknowledge the importance of adhering to CARB's specified conditions that necessitate comprehensive verification services. These conditions already include the issuance of an adverse verification statement or a qualified positive verification statement in the preceding year and the occurrence of a change in operational control of the reporting entity in the previous year.

Thank you in advance for taking the time to review our comments and solutions concerning these very important issues. We look forward to working with CARB and welcome any opportunities to discuss further and provide any additional assistance and insight.

Respectfully,

A handwritten signature in blue ink, appearing to read 'Jennifer M. LeRow', with a long, sweeping horizontal line extending to the right.

Jennifer M. LeRow
Director of Regulatory Compliance
Braya Renewable Fuels (Newfoundland) LP

May 9, 2024

Clerk of the Board
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Global Clean Energy's Comments on Proposed Amendments to the Low Carbon Fuel Standard

Dear Chair Randolph and Honorable Members of the Board,

Thank you for your continued dedication to enhancing air quality in the Golden State through the proposed updates to the Low Carbon Fuel Standard Program (LCFS). We appreciate the opportunity to comment on the proposal put forward by staff during the April 10 workshop.

As mentioned in our previous comment letters, Global Clean Energy stands ready to assist CARB in achieving its goals of ensuring renewable fuels deliver on their promise of sustainability. Importantly that includes safeguarding against land use change, deforestation, and other adverse impacts on the climate and the environment. As a California-based renewable fuels innovator with a production facility in Bakersfield, we work tirelessly to ensure our products have the lowest possible carbon intensity. What sets us apart is our focus on producing ultra-low carbon renewable fuels using *Camelina sativa* (camelina), a crop that does not contribute to any of the environmental concerns outlined above.

Camelina is a unique renewable fuel feedstock that offers regenerative agricultural benefits to the natural environment, soils, and farmers. It also sequesters carbon below ground while being grown, improving soil health similar to traditional cover crops. Camelina matures quickly, tolerates drought, and promotes biodiversity in fields where it is cultivated. Notably, camelina does not displace food crops. Instead, it grows on existing farmland during the fallow period between crop cycles — providing a new revenue source to farmers and rural agricultural communities while also strengthening domestic energy security. Camelina's unique agronomic traits give it the potential to be the least carbon-intensive renewable fuel feedstock available today.

Sometimes referred to as a harvestable cover crop, camelina falls under a new classification of crop-based feedstocks called "Intermediate Crops." These crops are cultivated during an idle or fallow period on existing farmland, and as a result, they do not cause land use change or adversely impact food production. Intermediate Crops, such as camelina, can responsibly help the state of California and the country reach our decarbonization goals in the hard-to-abate sectors of aviation, marine, rail, and heavy-duty vehicles with biomass-based liquid fuels.

As you endeavor to create an accounting mechanism to track crop-based feedstocks to their point of origin and develop the independent feedstock certification process proposed by staff, we encourage you to recognize the importance of emerging Intermediate Crops like camelina. By incentivizing the adoption of Intermediate Crops among growers and renewable fuel

producers, we can help ensure land use change is prevented, soil health is protected, and renewable fuel feedstock demand can be met responsibly.

080.1

As currently written, the Sustainability Audit Process requirements put forward by staff will be costly for farmers to adopt, providing a barrier to entry for promising new feedstock crops like camelina. Recognizing that newer feedstocks lack the resources of traditional commodities like soy, corn, or canola, we recommend that accounting rules should not place Intermediate Crops at a financial disadvantage as they establish themselves within the market.

080.2

In addition, the proposal appears to set a new standard for sustainability beyond the scope of the regulation and its environmental impact. This includes a proposed evaluation of the economic sustainability of the applicant (e.g., farm) and a review of their social practices (e.g., worker treatment). These additional criteria have the potential to add considerable administrative load to farmers and fuel producers, which could result in lower participation in the LCFS.

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Moreover, independent certification processes for crop-based feedstocks were recently outlined within the [Department of Treasury's Rule 40B guidance](#). This guidance mandates that in order to qualify for Federal tax incentives, crop-based feedstocks are required to meet USDA standards for climate-smart agriculture, or CSA, including no-till and cover cropping practices. This guidance is expected to be further expanded when Treasury introduces its guidance for Rule 45Z, the clean fuel production credit, in the coming months. Given this Federal certification is now in place, requiring secondary sustainability certification for feedstocks under the California's LCFS program would be duplicative.

More time and industry input are needed in this area. We encourage CARB to convene a stakeholder process before these sustainability audit criteria are finalized or adopted.

Global Clean Energy has extensive experience in Intermediate Crops and has been working in this field for over 15 years. We are also the global leader in camelina breeding and cultivation and are the only integrated company from seed to farm and farm to fuel. As experts in this new frontier of innovative crop-based feedstocks that also deliver regenerative agricultural benefits, we are eager to collaborate with CARB and other organizations. We stand ready to help develop appropriate sustainability criteria that address greenhouse gases and air pollution emissions related to feedstock production pathways.

We look forward to working together to ensure Intermediate Crops like camelina are supported while these sustainability criteria and standards are developed. Thank you for taking the time to consider our comments.

Sincerely,



Amanda Parsons DeRosier



Chair Randolph and Members of the Board
Page 3

Vice President of Public Affairs and Investor Relations
Global Clean Energy | www.GCEholdings.com



May 10, 2024

Liane M. Randolph
Chair

Steve Cliff
Executive Officer

California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Pearson Fuels comments on April 10th Low Carbon Fuel Standard Workshop

Dear, Chair Randolph and Executive Officer Cliff,

RTC Fuels, LLC, dba Pearson Fuels (“Pearson Fuels”), appreciates the opportunity to provide comments on CARB’s April 10th workshop regarding California’s Low Carbon Fuel Standard. Pearson Fuels is the largest distributor of E85 in California, supplying more than 370 fueling locations across the state. Pearson Fuels is providing an innovative, low-carbon E85 by replacing the gasoline component of E85 with renewable naphtha wherever possible. Paired with cellulosic ethanol, this E85 is fully renewable and low aromatic with greenhouse gas reductions approaching 80% compared to CARB unleaded gasoline.

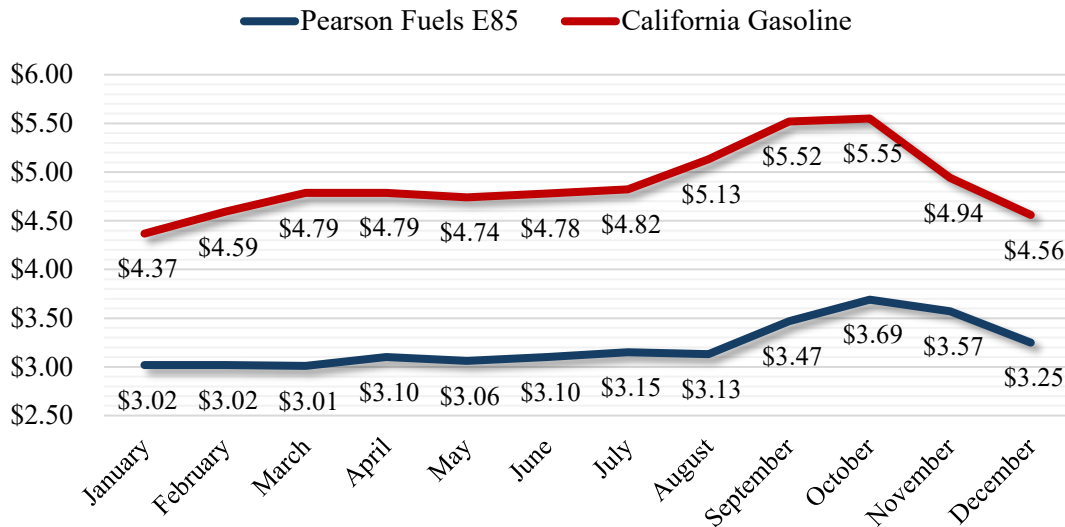
These comments focus specifically on a topic for discussion presented during the April 10 workshop. Given that existing internal combustion engines will provide essential access to transportation for many years, particularly to low- and moderate-income Californians, what liquid fuel options exist to meet demand, deliver GHG reductions and improve air quality?

E85 is a perfect example of how the Low Carbon Fuel Standard supports the growth of cleaner fuels without making those fuels more expensive for the consumer. Indeed, over the last several years, E85 has consistently saved consumers with flex fuel vehicles (FFVs) money compared to gasoline on a cost per mile basis.

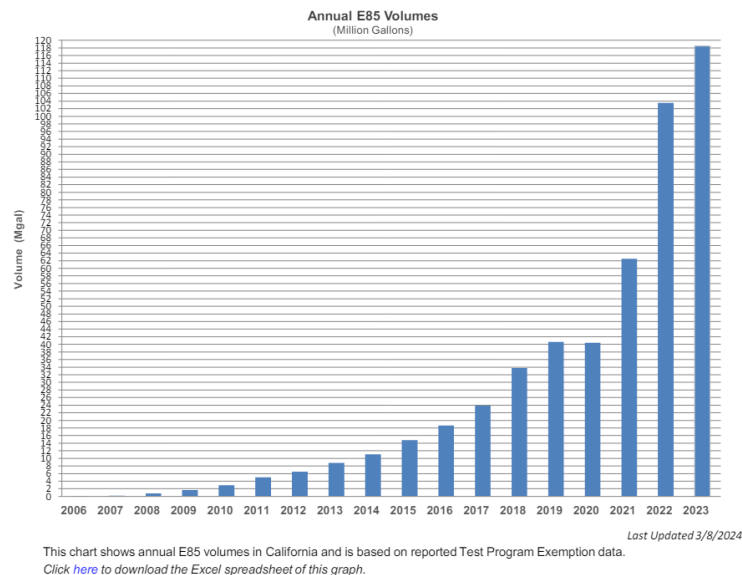
E85 can help the state in multiple ways. First, its carbon intensity can be as much as 80 percent less than regular gasoline.¹ Second, E85 offers substantial price discounts relative to gasoline, as seen in the graph on the following page. Finally, E85 allows Californians to dramatically reduce or eliminate petroleum consumption in the light-duty fleet. More than a third of the E85 fuel that Pearson Fuels supplies to the market is now composed of ethanol and renewable naphtha, instead of gasoline. Today, this E85-naphtha blend is 98% renewable and is the only light-duty liquid fuel that is both commercially available and capable of helping California achieve its goal of a 94% reduction in fossil fuel consumption by 2045, as called for in the 2022 Final Scoping Plan.

¹ LCFS Pathway Certified Carbon Intensities, retrieved from <https://ww2.arb.ca.gov/resources/documents/lcfs-pathway-certified-carbon-intensities>

Average Retail Price, 2023



The volume of E85 supplied to California drivers in 2023 reached a record-high 118.5 million gallons, continuing a remarkable 15-year trend of significant year-on-year growth.²



Along with strong market-share growth, the other promising trend for E85 is the re-emergence of new FFV models capable of using low-carbon E85. General Motors is offering 2025 FFV models in the Chevrolet Trax and Chevrolet Trailblazer, as well as the Buick Encore and Buick Envista.³ These vehicles will be affordable, with the added benefit of insulating drivers from \$5-

² California Air Resources Board, Alternative Fuels: Annual E85 Volumes, retrieved from <https://ww2.arb.ca.gov/resources/documents/alternative-fuels-annual-e85-volumes>

³ California Air Resources Board, New Vehicle and Engine Certification: Executive Orders for newly-certified Passenger Cars, Light-Duty Trucks, and Chassis Certified Medium-Duty Vehicles, retrieved from https://ww2.arb.ca.gov/sites/default/files/classic/msprog/nvepb/executive_orders/EO%20Web%20Files/PC-LDT-MDV/2025/0001/pc-ldt-mdv_pc_a-6-2427__sdt--20240202.pdf

PEARSON **FUELS**

\$6/gallon gasoline. While not certain, it is quite possible that the remarkable 15-year surge in E85 demand in California and the corresponding uptick in E85's utilization rate in FFVs was a factor behind GM's decision to offer more FFV models in 2025. We are also hopeful that Toyota's leadership in introducing strong hybrid FFVs in Brazil and initiating a strong hybrid pilot project in India will soon enter the U.S. – particularly the California marketplace.⁴

New FFVs offer the opportunity for massive carbon reductions at more affordable costs while driving down petroleum demand and creating competition in the liquid fuels market. We encourage CARB to consider FFVs as a practical and cost-effective solution to the challenge that long-lived internal combustion engines pose to California's petroleum and GHG reduction goals. The Pearson Fuels team is always available to serve as a resource on E85 and FFV issues, and we appreciate the engagement that we have had with CARB over our 22-year history of supplying alternative fuels to California.⁵

081.1

We urge CARB to continue to leverage E85 by exploring opportunities to incentivize automakers to manufacture FFVs. As UC Davis has noted in previous studies, California will need two billion gallons of gasoline alternatives by 2040, even under the most ambitious ZEV deployment scenarios.⁶ To that end, we highlight a recommendation from our comments to CARB in September 2023 regarding potential changes to the Low Carbon Fuel Standard:

“Expanding the supply of both FFVs manufactured by automakers and conventional gasoline vehicles converted to FFVs via aftermarket devices provides tremendous opportunities to empower all Californians to decarbonize while reducing consumer fuel costs and cutting fossil fuel usage.”

081.2

In closing, we support the most aggressive CI reductions that CARB determines feasible and commend CARB for the success of the LCFS program.

Sincerely,



Jeff Wilkerson

Government Policy and Regulatory Affairs Manager
Pearson Fuels

Cc: Joshua Cunningham, Branch Chief, Advanced Clean Cars
Mike McCarthy, Chief Technology Officer, Advanced Clean Cars

⁴ Toyota, “Launch of Toyota’s first of its kind pilot project on Flexi-Fuel Strong Hybrid Electric Vehicles (FFV-SHEV) in India, <https://www.toyotabharat.com/news/2022/launch-of-toyotas-first-of-its-kind-pilot-project-on-flexi-fuel-strong-hybrid-electric-vehicles-ffv-shev-in-india.html>

⁵ See: Pearson Fuels Website, “The Story of Pearson Fuels,” at <https://pearsonfuels.com/about/#:~:text=Established%20in%202002%2C%20Pearson%20Fuels,revolutionize%20the%20traditional%20fuel%20industry.>

⁶ Brown, A. L; Sperling, D.; Austin, B.; DeShazo, JR; Fulton, L.; Lipman, T., et al. (2021). Driving California’s Transportation Emissions to Zero. *UC Office of the President: University of California Institute of Transportation Studies*. <http://dx.doi.org/10.7922/G2MC8X9X> Retrieved from <https://escholarship.org/uc/item/3np3p2t0>

Submitted via electronic submittal: <https://ww2.arb.ca.gov/public-comments/low-carbon-fuel-standard-workshop-april-10-2024>

May 10, 2024

The Honorable Liane Randolph, Chair
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Low Carbon Fuel Standard Workshop, April 10, 2024

Dear Chair Randolph:

Brightmark LLC (“Brightmark”) appreciates the opportunity to submit comments on the Low Carbon Fuel Standard (LCFS) Workshop, held April 10, 2024 (“April Workshop”) regarding options to the LCFS proposed amendments released in December 2023 (“Proposed LCFS Amendments”). We appreciate the California Air Resources Board (CARB) engaging with stakeholders regarding changes and updates to the LCFS program.

082.1

California’s leadership in climate action through aggressive reduction targets and corresponding programs, like the LCFS, accomplishes actual pollution reduction and public health benefit outcomes by establishing market certainty to drive private investment. The state’s leadership and programs provide key solutions to the global climate challenge, however, more needs to be done.

The Q4 2023 Data Summary reported a record quarterly increase in the credit bank resulting in over 23.5 million cumulative credits at the end of 2023. With the regulation as proposed, the bank will reach 30-35 million credits by the end of 2024 and continue to increase in size in 2025, thereby further depressing credit prices and disincentivizing current and future investments needed to meet California’s climate goals.

The Proposed LCFS Amendments are **insufficient** to maintain and increase investment in the LCFS program and **risk stranding existing assets** that have relied on the program with the bank this large.

082.2

As with other workshops and rule proposals, the credit market has shown, through price indifference following the April Workshop, that the proposed changes are insufficient. Current LCFS prices indicate that the proposal in the April Workshop has not gone far enough in the April Workshop, the Proposed LCFS Amendments regarding Carbon Intensity (CI) targets, CI step-down, and the Auto Acceleration Mechanism (AAM). This trend in credit market decreases following CARB proposed rule announcements includes after the February 2023 workshop, after posting of the Standardized Regulatory Impact Assessment (SRIA) in September 2023, and after

082.2 cont. the release of the Proposed LCFS Amendments in December 2023. If the current prices continue, there is a real threat of stranded assets for current investments and limiting, if not eliminating, future investment.

082.3 The delays in the regulatory amendment process have prevented the implementation of the amendments in the first quarter of 2024. It is imperative that CARB implements a steep CI step-down to ensure that the bank returns to post 2023 levels (a reduction of approximately 23 million credits) by the end of 2025. This will help stabilize credit prices to maintain existing investments and increase future investment.

082.5 We support CARB using the three main levers: (1) CI targets, (2) CI step-down, and (3) AAM in the April Workshop and Proposed LCFS Amendments. To maintain existing investments, encourage future investments to meet long-term climate goals, and provide a stable credit market, CARB should develop a mix of percentage decreases based on an outcome that stabilizes the credit bank from its currently unsustainable oversupply levels.

082.6 The credit bank is projected to reach 30-35 million credits through the end of 2024 reporting, with the bank projected to increase in size by up to 7-12 million credits in 2024 alone. Increases of credits in the bank in 2024, because of delayed rule implementation, are causing downward price pressure needing immediate attention.

082.7 Unfortunately, in the April Workshop, the most ambitious step-down target of 9%, coupled with a 2030 CI target of 30%, will not adequately address the credit bank oversupply. Of the three options presented, Brightmark supports the most stringent 9% step-down, but to maintain and increase investment in the LCFS, a more stringent 10-12% step down should be implemented and allow the AAM to be triggered earlier.

California has a long history of supporting aggressive actions to address environmental challenges, like climate change. Governor Newsom has called for an even more aggressive approach to achieve climate neutrality. As CARB has stated, “[s]ignificant reductions in transportation emissions are needed to achieve state’s air quality and climate goals.”

082.9 We believe the reduction target should be 40% by 2030, combined with a step-down of 10-12%
082.10 in 2024. Because of the delay in LCFS rule implementation, the credit bank increases through
082.11 2024 are not addressed in the CI targets and step-down proposals. If not administratively
082.12 possible in 2024, then a 10-12% step-down in 2025 should be implemented. As with California’s Renewable Portfolio Standard program, the industry rises to the occasion with aggressive targets.

Brightmark Overview

Brightmark was founded in 2016 with the mission of solving some of the greatest environmental challenges facing the United States. One of these solutions is capturing methane emissions from organic waste and producing biogas and digestate through the natural process of anaerobic

digestion. Agricultural activities contribute approximately 30% to total U.S. greenhouse gas (GHG) emissions, a significant portion attributable to methane emissions from animal waste.¹

Brightmark operates over 30 net-negative carbon intensity projects on dairy farms across the U.S., including in California. Through these projects, Brightmark derives RNG from biogas captured from organic waste streams, cleaned, and conditioned to achieve the quality standards necessary to blend with or substitute for geologic natural gas. We work with dairy farmers to harness the energy potential of their dairy manure, provide them with solutions to meet their greenhouse gas reduction goals, and enhance farm profitability. We are committed to reimagining waste and building projects that benefit farms, their dairy, their communities, and the planet.

These facilities provide a win/win scenario for farmers and local communities; they help address methane emissions from organic waste produced locally and turn that waste into renewable energy and fertilizers. To date, our projects have offset over 950,000 metric tons of CO₂eq.

The LCFS program, and the certainty it provides to the market, is a key factor in the long-term success of projects like these in addressing environmental challenges. The CARB LCFS workshops throughout 2022 and 2023 highlighted the success of the LCFS, showing that the program is over-performing and helping California meet its reduction goals sooner than originally targeted.

082.13

An Auto Accelerator Mechanism Provides an Appropriate Guardrail Against Low Prices and Increases Investor Certainty

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As was stated above, current oversupply issues are causing challenges to the LCFS program. In addition to more stringent near-term targets, CARB should adopt a target accelerator mechanism to reduce the likelihood of future oversupply scenarios. An accelerator mechanism is not a substitute for appropriate changes in the targets. Still, it does offer an attractive additional tool to CARB if they wish to minimize future minor target-adjustment rulemakings. The key term here is “future oversupply scenarios.” The LCFS is already oversupplied with that oversupply projected to increase by 30-40+% higher from now through 2024. A sufficient step-down must be implemented where the AAM would not be triggered in the first year after the new amendments (2026). However, if a sufficient step-down is not implemented, the LCFS amendments should allow for the implementation of the AAM based on the 2025 data year.

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The details of the accelerator mechanism mechanics proposed by AJW at the May Workshop are well thought out and administratively feasible. A high credit-to-deficit (C/D) ratio and a high bank-to-deficit (B/D) ratio indicate an imbalance in credit supply and demand fundamentals. We encourage CARB to allow for a cumulative Credit/Deficit (C/D) bank trigger instead of waiting

¹ U.S. Department of Agriculture Economic Research Service, citing the U.S. Environmental Protection Agency *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2021*, April 2023 (EPA 2023).

082.17
cont.

for annual C/D numbers. Also, as proposed, the C/D ratio should be adjusted from 1.0 to 0.8. If the B/D ratio can be triggered, then the bank is too large. However, if a C/D ratio is between 0.8-1, then there will not be a significant enough decrease in the bank to impact prices and lead to future investment.

A dual trigger, consisting of both a C/D ratio and a B/D ratio, as proposed by AJW, will likely strike an appropriate balance and only activate when there is a high likelihood of systemic long-run oversupply. The proposed trigger values should be reassessed appropriately based on historical data from the CA LCFS system. Once the trigger conditions are met, responding with a jump ahead in compliance targets is a straightforward and transparent way to increase stringency. Aligning the timing of correction with the existing process to address significant undersupply (through the Credit Clearance Market) is appropriate and straightforward.

082.18

- **Policy recommendation:** To address current and anticipated credit oversupply that threatens the viability of RNG projects, a more aggressive carbon intensity target with an increase to at least 40%

082.19

- **Policy recommendation:** A CI step-down of 10-12% from the current regulation of 13.75% to at least 23.75% in 2025 to address current oversupply issues and increases in the bank that will occur in 2024. This level of ambition should also be implemented in Q3 or Q4 of 2024, if administratively possible.

082.20

- **Policy recommendation:** In the AAM,
 - allow for a cumulative Credit/Deficit (C/D) bank trigger, instead of waiting for annual C/D numbers, and adjust the C/D ratio from 1.0 to 0.8, and
 - allow for the AAM to be triggered as early as 2025.

Focusing on Solving the Problem

The goal of the LCFS is to reduce the carbon intensity of transportation fuels through greenhouse gas emission reductions. The LCFS is currently the only market with the economic incentive to develop carbon negative projects, including dairy biomethane. Due to the low energy density feedstock and higher required residence time, dairy digester projects result in higher costs per MMBtu produced due to the low energy density feedstock and higher required residence time.

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The success and market certainty of the LCFS program should be based on increasing the demand for credits, not limiting fuels and credit generation. Increasing demand for credits will result in greater overall emission reductions and a more diverse and stable credit pool. Avoided methane crediting should continue in LCFS until a realistic and proven replacement policy is implemented. Significant investments have been made in existing and future projects based on the current rules and trust in the LCFS program that emission reductions from these projects would be valued for delivering positive outcomes.

082.22 Brightmark supports the continued alignment of deliverability requirements for RNG with that of the federal Renewable Fuel Standard program. Biomethane projects that can theoretically deliver to California should be included, as the program currently operates. Current rules require that a project's CI score measure the additional carbon impact of traveling further in the CI calculation. Unlike transmission power grids, gas pipelines can deliver biomethane from the East Coast to the West Coast.

Market and Regulatory Certainty

082.23 The success of the LCFS to date shows the market's ability to deliver together in partnership with CARB. The LCFS, at its core, is a market-based, fuel-agnostic regulation that does not pick winners and allows for all fuels to compete.

Market and regulatory certainty are based on trust in California as a reliable place to sell low-carbon fuel and credits to meet and exceed climate goals. However, to continue to achieve aggressive targets, CARB must promote a long-term, stable environment to encourage investors and teams to create new and maintain existing CI-reducing projects. This requires that credit prices maintain a level for capital recovery of previous and future investments.

082.24 The ultimate goal of California and the market participants, like Brightmark, is decarbonization and eventual carbon neutrality of not only transportation, but all sectors of the economy. To reach this goal, California needs negative CI fuels for transportation and negative CI biogas for other uses (power, thermal, etc.). In-state and out-of-state RNG production are connected, the same developers that develop instate projects develop out-of-state projects. The current RNG production's success will lead to the development of additional RNG projects necessary to decarbonize the non-transportation sectors to achieve long-term goals.

082.25 Negative CI fuels require significant economic incentives and market certainty, which has eroded with current LCFS prices. Long-term depression of credit prices will lead to stranded assets and a lack of private investment in decarbonizing California's economy. CARB should send a strong signal by dramatically increasing the LCFS reduction targets and help return certainty to the market.

We appreciate the opportunity to provide comments. Please do not hesitate to reach out with any questions.

Respectfully Submitted,



Bob Powell,
Founder & CEO

FIRSTELEMENT FUEL

FirstElement Fuel Inc. | 5281 California Ave, Suite 260, Irvine, CA 92617 | 949-205-5553

Ms. Rajinder Sahota
Deputy Executive Officer, Climate Change and Research
California Air Resources Board
1001 I Street, Sacramento
California 95814

Subject: Comments on April 10, 2024 LCFS Workshop

Dear Ms. Sahota,

Thank you for the opportunity to comment on the subject workshop as well as the proposed changes to the LCFS program as identified in the Initial Statement of Reasons¹. As you may know, FirstElement Fuel (FEF) is largest retail hydrogen station provider in California due to the aggressive regulatory and policy instruments enacted by your Board, the most important of which is the LCFS program and the Hydrogen Refueling Infrastructure (HRI) capacity credits. The number one challenge we currently face is the historically low credit prices (< \$60/metric ton CO₂) that have persisted since 2023, resulting in our need to increase prices at the pump and effectively stopping our ability to attract further capital to expand the hydrogen refueling station (HRS) network. We support staff's recommendations to enact a steeper step-down and accelerate the auto adjustment mechanism to bolster the credit prices as soon as possible.

Light-Duty (LD) HRI

As with our previous letter, we strongly urge CARB to maintain the same structure for the LD HRI program, specifically to keep the 1,200 kg/day capacity cap with no geographic restrictions to station locations. The existing program had been working well, and between 2020 and 2022 we were building an average of 5 LD stations until the credit prices fell to, and have stayed at, these unprecedented lows. Once the mechanisms are put in place to raise credit prices, we are confident that we will be able to once again attract investments to continue building LD stations. In fact, the capacity cap should be increased to 1,600 kg/day to accommodate medium-duty (MD) trucks that will fill at local HRS.

If the recommended cap of 600 kg/day as stated in the ISOR is enacted for LD HRI, the result will not only disincentivize larger LD stations that would have grown the California HRS network to accommodate LD/MD, but it will also increase queuing and deliveries to stations, causing greater congestion and traffic, and increased emissions to the community – the exact opposite of the stated purpose for changing the LD HRI. In fact, these are the exact reasons we pivoted away from our first-generation, 250 kg/day stations, and deployed larger, liquid hydrogen stations.

¹ <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/isor.pdf>

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Heavy-Duty (HD) HRI

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We appreciate staff working with the hydrogen station developers to craft the program for heavy-duty HD HRI. We are confident that the proposed creation of the HD HRI will allow

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station developers to attract the needed investment to build stations with only minor changes to the proposed program. Specifically, we encourage elimination of the location constraints since many good HD fueling sites are not within one mile of FHA designated alternative fuel corridors or adjacent to truck parking lots. Further, a 15-year program will

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provide greater certainty for those investments, especially since the stations are much larger and more expensive than LD HRS. And finally, if a station is funded through local funds (as opposed to just state or federal grants), the proposed geographic restrictions should be waived.

80% Renewables by 2030

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The goal of the LCFS program is to reduce carbon, and hydrogen is CI 36² vs the grid at CI 81³ gCO₂e/MJ. So, the program is effective in decarbonizing hydrogen for transportation. However, renewable pathways for hydrogen are expensive and not readily available in-state. This will take time to develop, and ARCHES⁴ is on-track to do just that. But the timeframe for that production is well past 2030. We urge staff to maintain the 40% renewable requirement for hydrogen and conduct annual reviews to determine if increased renewable content is warranted.

HyCAP and HyScape

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We still have not been able to “test drive” the HDS HyCAP model to determine the credits for multi-use stations. Although we are confident that we will arrive at a workable solution, a definitive strategy and iterations on the modeling should be allowed before the regulation is finalized and brought to the Board.

We appreciate all of staff’s hard work in bringing these changes to the Board in a timely fashion. With a few minor changes, we believe the LCFS program will continue transforming the transportation sector to zero emissions and carbon neutrality.

Sincerely,



Matt Miyasato, Ph.D.

Chief Public Policy & Programs Officer

² https://ww2.arb.ca.gov/sites/default/files/2024-04/quarterlysummary_Q42023.xlsx

³ https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/fuelpathways/comments/tier2/2023_elec_update.pdf

⁴ <https://archesh2.org/about/>

The Honorable Liane M. Randolph, Chair
California Air Resources Board
1001 I Street
Sacramento, CA 95814

May 10, 2024

RE: Comment on Draft Amendments to the Low Carbon Fuel Standard (LCFS) Regulation

Dear Chair Randolph,

We appreciate the opportunity to provide comments on the Draft Amendments to the LCFS Regulation. We support the overall objectives of the LCFS program and would like to express our specific recommendations.

General Comments:

- 084.1 • We recommend CARB implement an immediate 9% step-down. This approach is most likely of those presented on May 10th to rebalance the LCFS credit bank.
- 084.2 • The AAM remains crucial. We suggest triggering it when the credit bank exceeds quarterly deficits by 2.5 times within a year, as recommended by ICF.

Sustainability Requirements:

We acknowledge the importance of establishing sustainability requirements for crop-based and forestry-based feedstocks under §95488.9.g to safeguard environmental integrity within the LCFS program:

All crop-based and forestry-based feedstocks used for LCFS fuel pathways must meet the following sustainability requirement:

- (1) *Maintain continuous third-party sustainability certification under an Executive Officer approved certification system.*
- (A) *All feedstocks at the point-of-origin must be certified by January 1, 2028. Fuel quantities reported under fuel pathways utilizing feedstocks not certified by January 1, 2028 must be assigned the ULSD carbon intensity found in Table 7-1 of the LCFS regulation.*
- (B) *The Executive Officer will review and may approve certification systems based on the following criteria:*

However, the current language regarding certification creates uncertainty for fuel developers. We recommend the following minor changes and clarification:

- 084.3 • We request clarification regarding §95488.9.g.1.A. As written, it is unclear whether projects initiated after January 1st 2028 can use crop or forestry feedstocks without being assigned the ULSD carbon intensity as the timing limitation could be interpreted to apply to future projects. We recommend changing the rule language to specifically outline the requirements for currently

certified pathways, pathways certified between 2025-2027, and pathways certified after January 1, 2028.

We recommend that CARB recognize three categories of eligible feedstocks:

- 084.4 • The current ambiguity around approved certification systems raises concerns for fuel developers. As a starting point, CARB should provide an initial list of acceptable verification schemes before regulation approval, allowing fuel producers to plan effectively. This can include the list that CARB suggested leveraging April-10 (RED, ISCC, RSB, and Bonsucro), but should still allow flexibility for other schemes if approved by CARB.
- 084.5 • CARB should recognize the alignment between LCFS and RFS programs and ensure their goals are not conflicting. We recommend any RFS-compliant forestry feedstock be recognized as CARB compliant, however CARB should not limit feedstocks to RFS-compliant material.
- 084.6 • Finally, the regulation should accommodate the use of woody biomass from forest fire abatement residues, as it aligns with the scoping plan and broader state goals, such as the Roadmap to a Million Acres, which call for the State of California to treat a minimum of 1 million acres of forested land annually by 2025. This material, not from managed forests, may be too complex for producers to certify under the verification schemes proposed on April 10. If this material will qualify as a waste, and thus not subject to sustainability requirements, that should be clearly stated.

Thank you for your consideration. We look forward to working together to strengthen the LCFS program.

Sincerely,

Stefan Unnasch
Managing Director
LIFE CYCLE ASSOCIATES

Anna Redmond
Project Manager
LIFE CYCLE ASSOCIATES



OHIO SOYBEAN ASSOCIATION

May 10, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95814

Via electronic submission

Re: Comments on April 10 Low Carbon Fuel Standard Workshop

The Ohio Soybean Association appreciates the opportunity to provide comments in response to the April 10 Low Carbon Fuel Standard (LCFS) workshop. The Ohio Soybean Association (OSA) is an affiliate of the American Soybean Association (ASA) and welcomes the chance to engage with the California Air Resources Board (CARB) regarding its most recent workshop.

The Ohio Soybean Association represents Ohio soybean farmers on domestic and international policy issues important to the soybean industry. Our organization represents thousands of Ohio producers and provides leadership for Ohio's soybean farmers in promoting effective policies and legislation to ensure a growing and profitable soybean industry. U.S. soybean growers have long been committed to producing the world's food, feed, fuel, and thousands of bioproducts in a sustainable and climate-smart way.

As CARB revises and refines provisions in the Initial Statement of Reasons (ISOR) package, we at Ohio Soybean Association are pleased to expand upon ASA's comments provided during the April 10 workshop. Of highest importance is ensuring that sustainability guardrails are workable for the soybean growers. Additionally, OSA requests that CARB update soybean land use change modeling that uses 20-year-old data and does not reflect current growing practices.

Positive Workshop Outcomes

The Ohio Soybean Association appreciates much of the work that CARB staff highlighted in the April 10 workshop and appreciate CARB providing significant opportunities for engagement. It's clear, liquid fuels will continue to be needed in the transportation sector in California for at least the next decade, and OSA believes the role of soy-based biofuels to lower emissions in today's remaining liquid fuel market is vitally important to help mitigate the impacts of climate change.

We appreciate that CARB explored soybean oil price volatility in recent years and determined that it was not the result of domestic biofuels policy, but instead the result of several factors, including the war in Ukraine, weather, and other market disruptions. Further, CARB dispelled arguments that use of soybean oil for biofuels was impacting food prices and called this argument a "misleading representation" of the interaction between food and fuel.

The Ohio Soybean Association also appreciates CARB's additional attention on waste feedstock integrity. Imports of these feedstocks, especially used cooking oil, have exploded in the past

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couple of years due to incentives in California's LCFS. During much of this period, used cooking oil (UCO) was worth more than virgin palm oil. The increase in U.S. imports of UCO occurred after the EU started investigating fraud allegations as much of the trade was rerouted to the North American market. Ohio Soybean Association encourages CARB to verify the integrity of imported UCO used in the LCFS.

Sustainability Guardrails: Exploring Additional Options

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While CARB had mentioned sustainability guardrails broadly before, this workshop was the first time that staff detailed potential sustainability measures required for agricultural feedstocks. Ohio Soybean Association understands that CARB must balance liquid fuel market demands with environmental sustainability goals in California. However, we believe that it is important to work with the biofuels value chain to develop an outcome that is economically and logistically viable for the industry.

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Unfortunately, the information provided in the ISOR and presented in the April 10 workshop offer limited explanation as to why sustainability guardrails are required for agricultural feedstocks. It is not clear what risks remain that must be addressed. If CARB insists that sustainability criteria for agriculture must be met, it should look to programs already developed through farmer input and provide improved scoring for feedstocks that employ sustainability practices to minimize the changes in comparative costs. Based on the criteria outlined in the

085.5

workshop and proposed third-party audit scheme, Ohio Soybean Association finds the proposal problematic.

Aligning Sustainability Guardrails with Federal Initiatives

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The recent tax guidance¹ for sustainable aviation fuel (40B) released by the Internal Revenue Service and Department of Treasury offers insights as to how CARB could offer improved scoring for feedstocks grown employing Carbon Smart Agriculture (CSA). The 40B tax credit uses a new GREET methodology (40BSAF-GREET 2024), which shows soybeans offer a 55% emissions reduction, and can improve an additional 5% using limited CSA. The U.S. Department of Agriculture's Climate Smart Agriculture Pilot Program is currently collecting a myriad of outcomes-based data on agricultural improvements from farmers using CSA. Rather than penalizing agricultural feedstocks through an onerous audit system, CARB should consider providing additional emissions reductions to feedstocks employing CSA.

In January, a new Clean Fuel Production Credit (45Z) will go into effect, which we hope will build on the cover crops and no till practices included in 40B. Conservation tillage, crop rotations, sustainable inputs, precision agriculture, and other practices all help produce a more sustainable soybean. Acknowledging the work being done throughout U.S. soybean fields will ensure that CARB does not restrict sustainable feedstocks from its fuel portfolio.

A Critical Need for Stakeholder Engagement

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Any agricultural sustainability criteria that CARB establishes will have significant impacts on how the soy industry and biofuels value chain operates. Hosting one workshop that included sustainability concepts did not provide enough of an opportunity for stakeholder engagement on this topic. Ohio Soybean Association supports ASA's request that CARB convene a working

¹ Department of Treasury and Internal Revenue Service. Notice 2024-37.

group of industry stakeholders before finalizing sustainability criteria to ensure that the logistical limitations and financial impacts that could result from this policy are properly considered.

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We encourage CARB to convene a working group that includes agricultural feedstock providers, feedstock processors, and biofuels producers to help develop any sustainability provisions that they would be required to implement. This working group should endeavor to flesh out workable sustainability guardrail provisions that CARB can implement by the second quarter of 2025. This would ensure that CARB develop a solution that does not unintentionally limit sustainable lipid-based feedstocks through onerous reporting requirements, while allowing CARB to continue to focus on implementation of the rest of the LCFS update by the end of 2024.

Updating Modeling for Soy Oil Feedstocks

Ohio Soybean Association is also concerned that without a comprehensive update to the GTAP-BIO that CARB utilizes and that relies on 20-year-old data, soy-based feedstocks will be phased out of the LCFS, even though current data indicates a much lower carbon intensity (CI) score.

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As mentioned above, the soy industry has made vast improvements in sustainability and efficiency over the past two decades, but CARB continues to rely on a 2014 model that uses data from 2004. The ILUC score accounts for half or more of the CI score for soy-based biofuels. The recently released 40BSAF-GREET 2024 model has an ILUC score of 12.2 for soy-based sustainable aviation fuel in federal programs, much lower than the model used by CARB. The benefits of the LCFS can only be achieved if CI values are accurately captured. If land use change concerns are large enough to justify sustainability guardrails, then the modeling should also be updated to reflect current land use change data.

Conclusion

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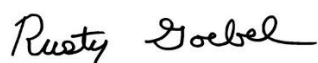
Ohio Soybean Association is encouraged by the continued successes of programs that support the development of cleaner, low-carbon fuels. California's LCFS has in turn supported rural economies that support the soy value chain. We appreciate the work that CARB has done to update and improve the LCFS. However, it is critical that CARB finalizes updates in a way that does not arbitrarily exclude agricultural feedstocks through onerous sustainability guardrails developed without the input of growers.

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cont.

The Ohio Soybean Association is eager to continue working with CARB to support the role of agriculture in diversifying the fuel supply and supporting cleaner fuel options in California and beyond. On behalf of Ohio soybean farmers, we appreciate the opportunity to comment and look forward to collaborating with CARB and other relevant stakeholders on implementation of policies that expand the use of soy-based biofuels and market opportunities for soybean farmers.

Respectfully,



Rusty Goebel
President, Ohio Soybean Association

To: California Air Resources Board
From: Jeremy Martin
Date: May 10, 2024
Subject: Comments on the April 10th LCFS Workshop

086.1

The Union of Concerned Scientists (UCS) is a long-standing supporter of the Low Carbon Fuel Standard (LCFS) and has been actively involved in its implementation for more than 15 years. We urge the California Air Resources Board (CARB) to modernize the LCFS to ensure it equitably meets the needs of Californians and supports the attainment of air quality standards. Beyond California's borders, the LCFS is an important policy model for other states and the federal government, which could help address the many deficiencies of the Renewable Fuel Standard. But to meet these needs the LCFS must be modernized, to rebalance credit markets, provide reliable support for non-combustion pathways, strengthen safeguards against deforestation and the diversion of food to fuel use and phase out counterproductive methane digester subsidies that are contributing to dairy and meat industry consolidation. We have already submitted [extensive comments](#) on the December proposal and presented on the need to cap the use of crop based biofuels at the March 15th meeting of the AB32 Environmental Justice Advisory Committee Meeting ([slides](#) and [video](#)).

086.2

The comments below respond specifically to new information made available in advance of and during the April 10th LCFS workshop. These comments focus on insights gleaned from the release of the input and output files for the CATS model. This data allows for a more complete understanding of the staff proposal and to evaluate alternatives in a more quantitative manner. Our new analysis of the CATS model demonstrates that without a cap, there is a substantial risk that continued expansion of vegetable oil-based renewable diesel will destabilize LCFS credit prices, undermine support for transportation electrification including the Advanced Clean Fleets rule, harm the global poor and accelerate tropical deforestation.

The CATS model projects bio-based diesel market stability in contrast to observed behavior and analysis from other experts.

086.3

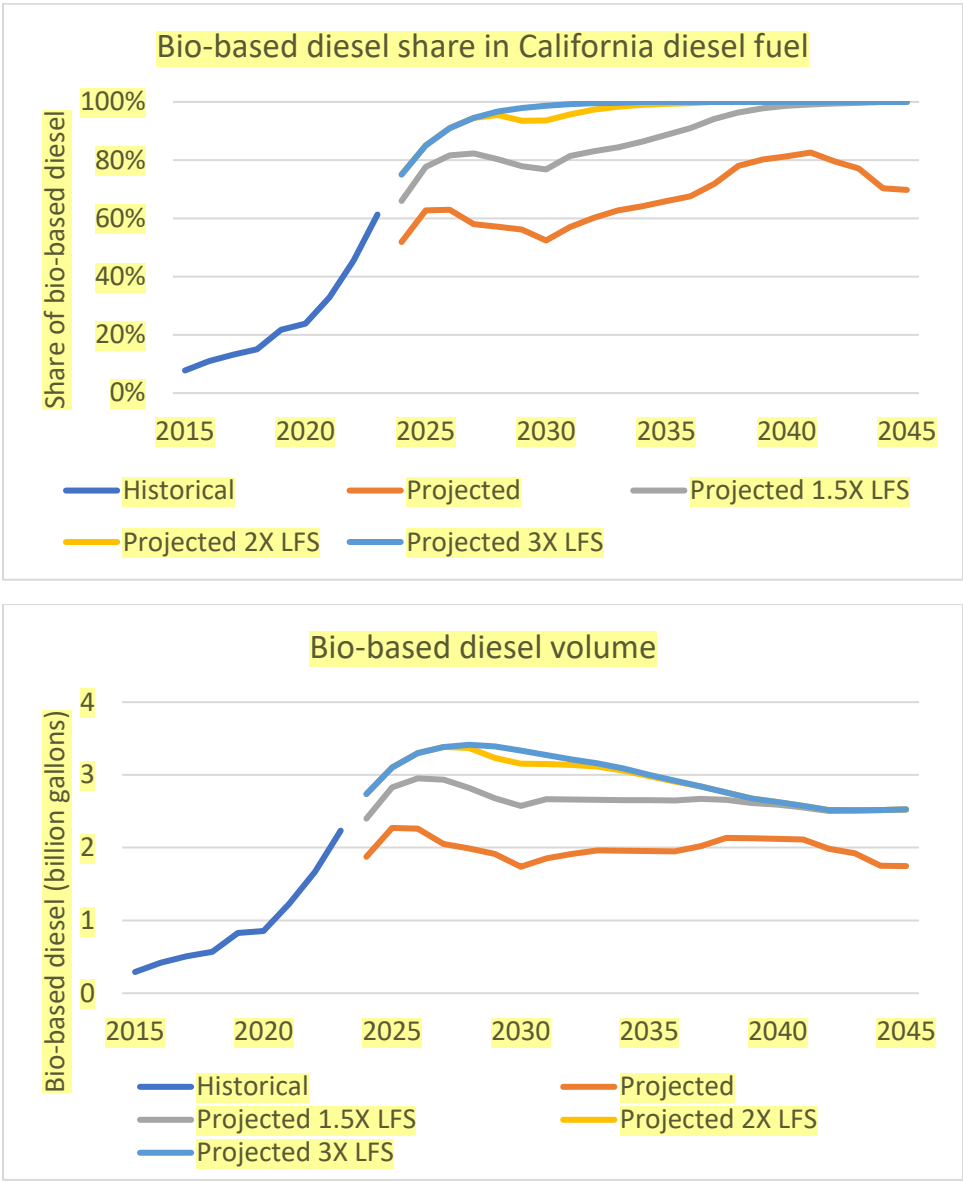
The CATS modeling on which the ISOR and SRIA are based projects that biobased diesel volume has reached its peak and will not exceed current production levels going forward. This is inconsistent with analysis from several well qualified outside experts¹. Both groups conclude that the CATS model is substantially underestimating renewable diesel growth, and the Bushnell group specifically finds that renewable diesel growth will continue until the California diesel pool is effectively saturated, which is likely to happen in 2028.

To understand the implications of rapidly saturating the diesel pool, I adjusted the feedstock supply curves in the CATS model input files to produce renewable diesel consumption projections more consistent with this analysis and the recent historical record. Figure 1A and 1B compare historical bio-

¹ James Bushnell, Gabriel Lade, Aaron Smith, Julie Witcover, and Wuzheqian Xiao "[Forecasting Credit Supply Demand Balance for the Low-Carbon Fuel Standard Program](#)" (August 2023) | WP-340 | [Blog Post](#) and Colin Murphy and Jin Wook Ro, "[Updated Fuel Portfolio Scenario Modeling to Inform 2024 Low Carbon Fuel Standard Rulemaking](#)" (February 2024). Reference: UCD-ITS-RR-24-12

086.3 cont.

based diesel trends with projections from the revised 15-day scenario presented at the April workshop and compares the same scenario with increased lipid feedstock supply (LFS). In contrast to the staff projection, increasing LFS by 50 percent (1.5X), 100 percent (2X) and 200 percent (3X) lead the bio-based diesel share of the diesel pool to keep rising, reaching 100 percent in 2043, 2036 and 2032 respectively. Moreover, the peak in bio-based diesel volume consumed in California rises to a level 30, 49 and 50 percent higher than the staff analysis.



086.4

Allowing California’s renewable diesel boom to continue until consumption exceeds 3 billion gallons of bio-based diesel will harm the global poor and accelerate tropical deforestation by diverting soybean oil from food to fuel and leaving palm oil to replace soybean oil in food markets. A continued expansion of renewable diesel will also destabilize LCFS credit markets, lowering credit prices and reducing support for transportation electrification and other more scalable alternative fuels.

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Relying on the auto-acceleration mechanism to correct the credit glut will lead to unstable credit price, with a period of very

low credit prices followed by a sharp spike in compliance costs. Capping the use of lipid-based fuels at a level consistent with the ISOR projection will more effectively stabilize LCFS credit markets.

Continuing California's renewable diesel boom will harm the global poor and accelerate tropical deforestation

As explained in detail in previous comments from UCS and other experts², California's renewable diesel boom has major implications for global vegetable oil markets, which affect access to food and cultivation of soybeans, oil palm and other oilseed crops, which are among the most significant drivers of tropical deforestation. Consumption of vegetable oil and other lipid feedstock to produce bio-based diesel for consumption in California doubled three times since 2015, starting at 1 million metric tons (MMT) in 2015 it exceeded 2 MMT in 2018, 4 MMT 2021 and 8 MMT in 2023. This rapid growth has outstripped secondary fats and oils, leading to increasing use of vegetable oil, especially soybean oil, which grew from 0.6 MMT in 2021, to 1.0 MMT to 1.6 MMT in 2023. Without a cap, lipid consumption for California bio-based diesel could grow by another 50% or 4 MMT, exceeding 12 MMT. California renewable diesel producers are already looking to global markets to secure feedstock, and experts agree that soybean oil is the most widely available vegetable oil that is eligible for US bio-based diesel production available in global markets. But with only 12 MMT of soybean oil traded in global markets in 2022, it's clear that increasing California demand for vegetable oil by up to 4 MMT will have a profound effect on vegetable oil markets, putting renewable diesel production for California in direct competition with global food markets.

The workshop presentation on crop sustainability began with a strong statement of purpose "Biofuel production must not come at the expense of deforestation or food production." Unfortunately, the discussion that followed did not live up to that commitment, and staff continue to refuse to consider the most direct and effective guardrail to address deforestation or food production, which is to limit the quantity of feedstock used to make fuel as a sustainable level with a lipid-based fuel cap. California renewable diesel consumption has already contributed to the global food crisis in 2022 by consuming almost 1 MMT of soybean oil during a historic spike in vegetable oil prices. Since it takes years to make changes to the LCFS, it would be irresponsible to wait until the next food crisis to act.

With renewable diesel producers diverting a growing share of soybean oil from food markets to fuel production, consumers around the world will shift to palm oil. Tracking or certification of the feedstock directly used to produce fuel for California will not address the harms caused by increased palm oil production required to replace the diverted soybean oil in food markets.

A continued renewable diesel boom will destabilize the LCFS credit market

Because staff ignore the risk of a continuing boom in renewable diesel, the staff analysis projects stability in bio-based diesel, which in turn supports stable LCFS credit prices. The updated (15 day) CATS analysis of the staff proposal projects credit prices between 2025 and 2035 averaging \$144 (±41) per metric ton of CO2 equivalent emissions below the standard and a 60 percent share of bio-based diesel (BBD) in California's diesel pool. However, if the renewable diesel expansion continues and reached a 95% share of BBD, consistent with expert analysis cited above, credit prices between 2025 and 2035 will collapse to \$52 (±30)/MT. This is not a healthy state for the LCFS credit market and will undermine LCFS support for transportation electrification.

² Scientists and economists letter calling for a cap on the use of vegetable oil-based biofuels in the LCFS.
<https://www.arb.ca.gov/lists/com-attach/6959-lcfs2024-BXYAZQZuUmQGbgF1.pdf>

Relying on the auto-acceleration mechanism to correct the credit glut will leave the policy with low credit prices until 2030, and then create a large swing in credit prices. The CATS model (run with 2X lipid feedstock availability) projects that credit prices would jump from an average of \$86/MT between 2025 and 2029 to the credit price ceiling of \$221/MT and remain at the ceiling through 2040. As described below, a lipid cap would lead to a more stable LCFS credit market than relying on the AAM.

Staff should evaluate at least one scenario in which diesel consumption is rapidly replaced by 100 percent bio-based diesel (by 2028) and evaluate the implications for global vegetable oil markets and LCFS credit markets.

The future trajectory of California’s renewable diesel market is quite uncertain, subject to many factors, only a few of which are captured in the CATS model, and many outside the control of California regulators. It is not realistic to expect any model to accurately predict the future. However, for the purpose of evaluating the proposed LCFS amendments, it is extremely important to consider the very plausible scenarios that renewable diesel boom continues until the diesel market is saturated with bio-based diesel.

In 2023, California renewable diesel consumption grew 42 percent, and bio-based diesel consumption accounted for 49 percent of LFS credits generation. In the staff analysis, renewable diesel consumption stabilizes below the current peak and by 2028 it has fallen 15 percent. By contrast, external analysis predicts renewable diesel consumption could rise 50 percent by 2028 versus its 2023 level. Whether renewable diesel consumption falls 15 percent or rises 50 percent in the next 4 years will have a profound impact on the credit balance of the LCFS program, and both scenarios should be evaluated explicitly in the rulemaking process.

Staff should evaluate the how LCFS program will perform using double the feedstock availability at each price, that is cells AH1:AP3 in the feedstock tab of the input table should be as follows.

600	800	1000	1200	1400	1600	1800	2000	2200
933904	697481	697481	697481	697481	697481	697481	697481	
5518591	409348	409348	409348	409348	409348	409348	409348	inf

To be clear, I have not conducted an alternative assessment of feedstock supply. The table above was developed by working backward from the analysis of Bushnell, et al. The feedstock supply curve is one of several factors that dictate how much renewable diesel the model projects will be consumed. Other factors include conversion costs, exogenous subsidies and strategic decisions of fuel producers and distributors that are not captured the in CATS model. Other combinations of CATS inputs could be adjusted to achieve a similar result. However, I do not believe these factors influence the CATS output outside of the determination of how much RD will be supplied at a given LCFS credit price. What is important is to understand the policy implications of the possibility that the Bushnell et al. analysis is correct and bio-based diesel saturates the California market in 2028. Evaluating the higher available feedstock supply is a straightforward means to evaluate this risk.

Staff should evaluate lipid-based fuel caps in addition to a bio-based diesel phaseout

In the ISOR, the staff proposed and rejected Alternative 1, which phased out rather than capped renewable diesel. This alternative was not responsive to the input from UCS and ICCT calling for a cap³

³ Jane O’Malley, Nikita Pavlenko, Stephanie Searle, and Jeremy Martin. [Setting a lipids fuel cap under the California Low Carbon Fuel Standard](#) (August 2022).

and we reiterate our request that staff evaluate the impact of capping bio-based diesel. The staff justification for rejecting Alternative 1 has focused heavily on the large increases in fossil diesel consumption required in the event of an RD phaseout. But a cap would not lead to any increase in the use of fossil diesel. A cap set at a level consistent with current consumption would reduce the risk that a continuation of the renewable diesel boom destabilizes food markets and LCFS credit markets.

086.14
cont.

Staff should evaluate a cap on lipid-based fuels to understand the effect on LCFS markets. In my analysis I evaluated a cap on renewable diesel (RD) at 1.6 billion and 2 billion gallons (BG). Since the CATS input file effectively fixed biodiesel consumption at 280 million gallons, the net effect of the 1.6 BG or 2 BG RD caps I imposed are to cap bio-based diesel (BBD) consumption at 1.9 or 2.3 BG. The 1.6 BG RD cap is consistent with CARB's projections for the 15 day proposal, while the 2.0 BG RD cap is consistent with capping the program at 2023 production levels.

A caps at the level projected in the ISOR will stabilize credit prices and avoid harmful unintended consequences

Implementing a cap in the CATS model at 1.6 BG of renewable diesel (1.9 BG of bio-based diesel including biodiesel) resulted in average blend rate of 56 percent bio-based diesel and credit prices between 2025 and 2035 averaging \$156 (±51)/MT. Rerunning the CATS model with a 100 percent increase in lipid feedstocks (LFS) has very little impact on the share of bio-based diesel, which increased to just 5 percent, and keeps credit prices at \$162 (±57). Stable credit prices will support transportation electrification and innovation in new fuel pathways while avoiding the harmful impact of excessive bio-based diesel consumption on global vegetable oil markets and deforestation.

086.15

Responses to CARB discussion on feedstock April LCFS Workshop:

In the absence of a cap, substantial increases in virgin oil fuel use in California will occur over long-term

In the workshop presentation, staff says "Based on current and future understanding of market conditions, it is uncertain if substantial increases in virgin oil fuel use in California will occur over long-term." If California's bio-based diesel consumption remains at current levels, the differentiated support for fuels made from secondary fats and oils provides a clear incentive to secure feedstocks that enjoy preferential treatment. This is clearly happening now with the remarkably fast increase in imports of used cooking oil, especially from Asia. The scaleup has been so dramatic as to raise considerable skepticism about whether the feedstock is legitimate, and CARB should certainly move forward with detailed traceability, verification and/or enforcement of waste feedstocks to avoid fraud.

086.16

However, despite the long-standing incentives to encourage the use of secondary fats and oils, the use of soybean oil as a feedstock has increased steadily. The most recent quarterly data shows that California consumption of virgin oil-based fuels increased more than 50 percent in 2023 over 2022, reaching 1.5 MMT of feedstock. Market analysts across the spectrum agree that supplies of secondary fats and oils are effectively tapped out, and substantial increases in production will inevitably draw from soybean and other first use vegetable oils. This is partly why the large increases in imports of UCO create suspicions of fraud.

In the absence of a volume-based cap, the renewable diesel boom is likely to continue. Saturating the California diesel market would imply 4.5 billion gallons of bio-based diesel with feedstock requirements for reaching 12 million metric tons by 2028, a 50% increase over current usage. It is exceedingly unlikely

086.16
cont. that there is an adequate supply of legitimate secondary fats and oils to meet this level of supply, so it is almost inevitable that this supply will be met with soybean oil (or fraudulent UCO).

086.17 Increasing demand for vegetable oil and other lipids by up to 4 MMT of feedstock will certainly have a major impact on global vegetable oil markets. Total global trade in all sources of vegetable oil is about 80 MMT, of which more than half is palm oil. Increasing California's consumption from 8 to 12 MMT of lipids would have a substantial impact on global oil prices. There are many other factors that influence oil vegetable prices, but California has become a significant factor.

As explained in my earlier comments, the limited rate of growth in global market for soybean meal means that large increases in the use of soybean oil for fuel will be primarily backfilled with palm oil. However, because the palm oil will substitute for soybean oil diverted from food markets, prohibiting the use of palm oil for fuel production will have no meaning impact on avoiding deforestation associated with expanded palm production.

LCFS support for virgin oil feedstocks does not “phase out naturally”

086.18 Page 40 of the staff presentation is titled “Credit Generation for Virgin Oil Feedstocks Naturally Phases Out” and on the graph is a note explaining that “virgin oils become deficit generating in 2033 under ISOR proposal, or 2030 if AAM triggered twice.” While this is technically true, it is deeply misleading. The compliance value of renewable diesel for an obligated party is not just the credits generated, but the deficits avoided by replacing fossil diesel with a lower CI fuel. The difference between the carbon intensity of renewable diesel and fossil diesel does not change as the standard is reduced, so the compliance value remains the same, even as the credits change.

To illustrate, in 2024, with a CI standard of 88 g/MJ, a CI for fossil diesel (ULSD) of 100 g/MJ and a CI for Soybean oil renewable diesel (Soy RD) of 60 g/MJ, the compliance value of replacing ULSD with Soy RD is 40 g/MJ, 28 g/MJ from credits and 12 g/MJ from avoided deficits. When the CI of the standard falls to 60 g/MJ, the compliance value remains unchanged at 40 g/MJ. There is no credit generation, but the avoided deficits increase to 40 g/MJ. Even if the CI standard is zero, it would still be worth 40 g/MJ to use Soy RD in place of ULSD to reduce the number of deficits per gallon of diesel fuel sold. For this reason, declining credit generation would not “naturally phase out” the risk of unsustainable levels of vegetable oil-based fuel consumption.

Increasing LUC for certain fuel/feedstock combinations may be warranted but is not sufficient to address market wide impacts of expanded lipid based fuel consumption in California.

086.19 In the workshop slides, CARB staff mentioned that they are evaluating the option of increasing LUC for certain fuel/feedstock combinations. This is a reasonable idea for feedstocks sourced in areas with supply chains more directly linked to damaging land use change. However, because soybean and soybean oil are fungible commodities traded on global markets, this disincentive will have little meaningful impact on reducing deforestation. The total level of lipid-based fuel consumption is the primary driver of deforestation, and a cap is the most straightforward way to address this problem.

086.20 **Given existing combustion engines persist, what liquid fuel options exist to meet demand and support GHG and air quality needs?**

086.21 The Durbin et al. studies on diesel engines makes clear that the air quality benefits of renewable diesel are primarily observed when it is used in off-road equipment and the declining fleet of older on-road diesel engines, and no statistically significant benefits are seen in the new technology diesel engines that consume the vast majority of the diesel fuel. If CARB analysis find that fuel switching to renewable

086.21 cont. diesel is an important and cost-effective strategy to improve air quality, it should develop incentives or mandates to encourage or require the use of this fuel in vehicles and regions where the health benefits are most significant. Under the proposed amendments, the decision on where and whether to sell renewable diesel is left entirely at the discretion of the fuel retailers, and the vast majority of the fuel will presumably be used in vehicles where it offers no meaningful air quality benefits.

086.22 From a climate perspective, the disproportionate focus on lipid-based fuels is counter-productive. Many climate analyses find that bio-based fuels can help meet climate targets but few if any of these analysis focus on lipids as a significant feedstock because they are expensive, their yields per acre are low, supply of low CI lipid feedstocks is inelastic, and soybean and palm oil are major drivers of deforestation. Capping the use of lipid-based biofuels at a reasonable level will encourage fuel producers to focus on commercializing other more scalable feedstocks. The absence of a cap discourages investment in these more scalable feedstocks, because in the short term it is easier for an existing oil refinery to outbid food consumers in global vegetable oil markets than to make long term investments. Capping this pathway will provide a signal to investors that long term investments in biomass-based fuel pathways will not have to compete against an unrestricted volume of lipid-based fuels.

Should E15 be considered to help reduce retail gasoline costs?

Please provide more information so that I can comment on this question in detail. How widely does CARB anticipate E15 would be available? Is it plausible or likely that E15 could quickly become the predominant gasoline blend in California? What would the impact be on total ethanol consumption?

086.23 My general view is that is that gradually increasing the ethanol blending rate at a speed that is offset by decreased gasoline consumption so that total ethanol consumption is flat or gradually declines is not a concern, since there would not any additional cropland required to supply that fuel. I would be concerned if total corn used a feedstock for fuel consumed in California grew rapidly, as has been recently observed for vegetable oil used to produce bio-based diesel. The land use impact is dictated by the total feedstock consumed for all fuel, including E10, E15, E85 and any corn ethanol made into jet fuel. The scaleup of these fuels, especially ethanol to jet fuel, is hard to predict and depends on many factors outside the control of the LCFS.

As a safeguard, CARB should clarify that total corn consumption for all fuels used in California will not be allowed to exceed the level used in 2023, roughly 0.5 billion bushels of corn. Under current expectations, this level seems unlikely to be exceeded, even with some growth in the use of E15 or ethanol made into jet, since E10 blending will be falling with gasoline consumption. By clarifying this expectation now, California can proactively avoid a future land use problem and provide investors a clearer expectation about the scale of the opportunity for new fuels based on corn and encourage investment in pathways based on underutilized feedstocks.

Additional Questions

086.24 Slide 25 in the workshop presentation shows that the number of legacy engines in the on-road fleet will decline dramatically over time, and slides 25 and 26 show and that there are no statistically significant air quality benefits to using RD in NTDEs. Please clarify what PM and NOx emissions benefits if any were attributed to the use of renewable diesel in NTDEs in the air quality analysis. I was not able to find this information in the air quality workbook.

April 10, 2024

Rajinder Sahota, Deputy Executive Officer
Matt Botill, Chief, Industrial Strategies Division
Low Carbon Fuel Standard Program
California Air Resources Board
1001 I St.
Sacramento, CA 95814
Via Online Submission

Comments on Low Carbon Fuel Standard Workshop

Dear Ms. Sahota/Mr. Botill and CARB Low Carbon Fuel Standard Program Staff:

Thank you for the opportunity to provide comments in response to the Low Carbon Fuel Standard Workshop held April 10, 2024. We appreciate CARB hosting this workshop.

As background, Oberon is an innovative California company founded in San Diego 13 years ago with a focus on decarbonizing the global LPG/propane industry while laying the foundation for renewable hydrogen. We are accomplishing this today by producing renewable dimethyl ether (DME) at our Brawley, California production facility. Oberon's rDME® brand fuel can be made from various in-state waste streams (*e.g.*, dairy manure biogas, waste water treatment biogas), which can enable smaller, often stranded, biogas suppliers to participate in the LCFS program and produce low carbon DME.¹ Oberon's rDME fuel can reduce the carbon footprint of transportation when used as a: 1) blending agent with Liquid Petroleum Gas (LPG)/propane; 2) hydrogen carrier to power the growing fuel-cell electric vehicle and stationary source market; and 3) diesel substitute. This range of creative applications that clean fuels, such as DME, can support is underscored in the recently adopted 2022 Scoping Plan Update—DME along with other clean alternatives to petroleum are a key part of the solution if the state is to reach its legislatively-mandated greenhouse gas reduction targets.

Responses to April 10, 2024 Workshop Presentation

087.1

Oberon supports the proposed amendment package and urges Board consideration and adoption by mid-2024. Oberon strongly supports the key concepts for rulemaking including increased stringency of the program to displace fossil fuels, incentivizing more production of clean fuels needed in the future such as low-carbon hydrogen, supporting methane emissions reductions, and deploying biomethane to meet the most crucial needs across transportation and other sectors.

¹ The California Air Resources Board has estimated dairy biogas-based DME made by the Oberon process has a carbon intensity of -278. rDME® is a trademark of Oberon Fuels, Inc.

In the 'Other Comments' section below we offer suggestions for further clarity where the Regulatory Proposal may benefit from a more fulsome consideration of rapidly developing technology and commercial practices.

Other Comments

Oberon wishes to reiterate a number of prior comments as CARB considers additional analysis as it finalizes the Regulatory Proposal. These are expanded upon in more detail in prior Oberon comment letters and are summarized here for convenience.

- **Program Stringency**

087.2

While we believe that the proposed 5% step-down in stringency may slow the rate of growth in the cumulative credit bank, it simply does not go far enough. The cumulative credit bank is anticipated to increase its rate of growth as new clean fuel projects that have been or are being constructed to bring more clean fuels to market. Informed by the unprecedented growth in the bank (e.g., 3 million credits were added to the bank in Quarter 4 of 2023) the step-down should be increased by at least 9%, which, for perspective, translates into a 2030 target of at least 4% reduction in the CI relative to the 2010 baseline. While a 9% step-down will still leave many credits in the cumulative credit bank, this single adjustment will translate into millions of additional tons of GHG emission reductions that would've otherwise gone unaddressed.

- **Avoided Methane Crediting**

087.3

CARB's draft regulatory language is silent on avoided emissions credits from feedstocks other than dairy, swine, and organics diverted from landfill. While we believe the current Tier 2 process is sufficient for a user to develop and CARB to approve avoided emissions credits for feedstocks such as poultry manure, project developers and users may benefit from further regulatory clarity.

- **Livestock Offset Protocol**

087.4

The Livestock Offset Protocol (LOP) uses methane conversion factors taken from Chapter 10 of the 2006 Intergovernmental Panel on Climate Change ("IPCC") entitled *Emissions from Livestock and Manure Management* ("Chapter 10"). Section 10.4 of Chapter 10 (pp. 35 – 52) provides these factors for many types of livestock in addition to dairy and swine, including poultry (both layers and broilers) and beef cattle. CARB may amend the LOP or create a separate LOP for the LCFS to add user clarity for other feedstocks.

- **Biomethane Crediting – Book-and-Claim**

087.5

CARB should expand the exemption to the deliverability requirements beyond hydrogen to include use in fuel production where biomethane is an intermediate feedstock if the

finished fuel is physically delivered into California. With appropriate limits and the verification and validation procedures CARB already has in place, we believe there is an opportunity to incentivize investments that deliver substantial reductions in greenhouse gas emissions while retaining the critical oversight and compliance that has been foundational to the success of the program.

- **Book-and-Claim of Low-CI Hydrogen**

We recognize that meeting California's ambitious goals for deploying large scale hydrogen projects will need to incorporate low carbon intensity hydrogen carriers such as DME. We ask that CARB consider adding explicit language or clarity around the opportunity to apply Book-and-Claim for renewable hydrogen pathways that involve an intermediate step or use of hydrogen carrier-molecules such as renewable DME. This approach is fundamental to rapidly ramping up the use of renewable hydrogen as envisioned by the Scoping Plan and the ARCHES effort.

087.6

Recommendations for Future Action

Oberon encourages CARB to ensure there continues to be a market for low-CI liquid and gaseous fuels as they are an important decarbonization tool, especially in sectors that are hard to decarbonize. Oberon recommends that CARB send a clear policy signal that biofuels (e.g., biomethane, renewable propane, renewable DME) are necessary and effective decarbonization strategies in these other sectors (e.g., residential, commercial, industrial) and are fundamental to the state meeting its ambitious GHG reduction targets.

As the state transitions out of combustion in the transportation space gaseous and liquid fuels will continue to support the industrial, commercial, and residential sectors with escalating pressure to drive down GHG emissions. One approach for doing so is stronger signals and incentives for the production and use of low-CI fuels in those sectors. Expanding the LCFS or creating a LCFS-like structure to help facilitate decarbonization of other gasoline-, diesel-, fossil natural gas-, and propane-fueled applications in residential, commercial, and industrial markets is an opportunity that merits attention. Doing so would reward investments and use of cleaner fuels by these legacy sectors that are not anticipated to be electrified for many decades. In the last year new domestic and international policies have been established to apply the LCFS approach beyond transportation fuels such as Vermont's Clean Heat Standard, the Canadian Clean Fuel Regulation, and the EU ETS II which cover both transportation and non-transportation fuel. Policy expansion, as signaled in the Initial Statement of Reasons for the proposed LCFS amendments, will support additional reductions in greenhouse gas emissions by further accelerating the market development of low carbon fuels such as renewable DME.

Thank you for your time and consideration. Please do not hesitate to contact me at cristin.reno@oberonfuels.com with any questions.

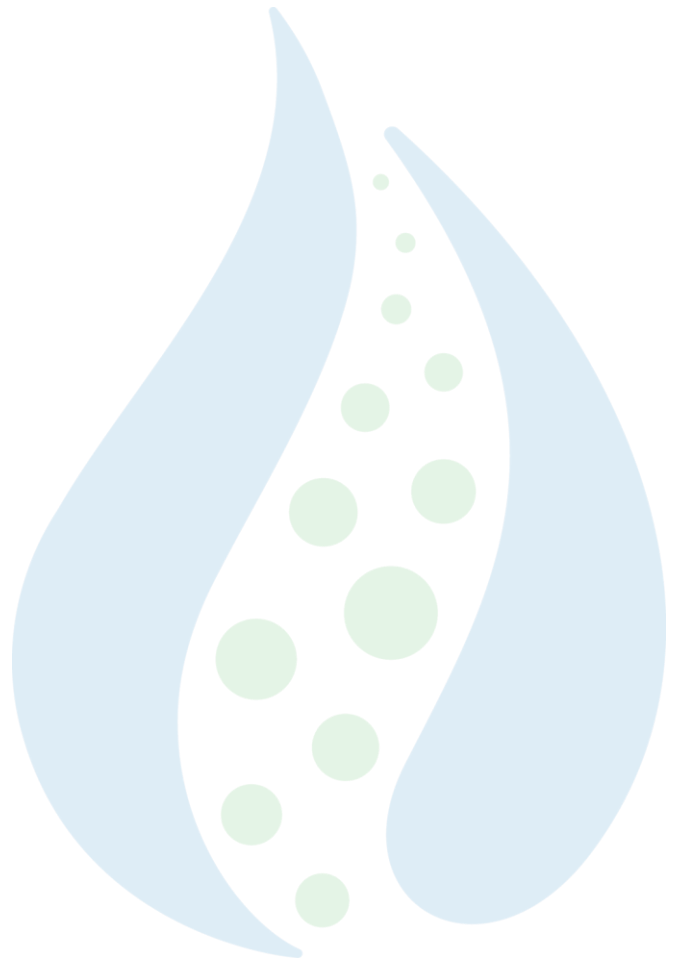
Sincerely,

A handwritten signature in black ink, appearing to read "Cristin Reno".

Cristin Reno
Manager, Regulatory Affairs
Oberon Fuels

CC:

Liane Randolph, Chair
John Eisenhut, Boardmember
Susan Shaheen, Ph.D., Boardmember
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Gideon Krakov, Boardmember
Senator Henry Stern, Boardmember
Assemblymember Eduardo Garcia, Boardmember



May 10, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95814

Via electronic submission

Re: Comments on April 10 Low Carbon Fuel Standard Workshop

The Kansas Soybean Association appreciates the opportunity to provide comments in response to the April 10 Low Carbon Fuel Standard (LCFS) workshop. KSA is an affiliate of the American Soybean Association (ASA) and welcomes the chance to engage with the California Air Resources Board (CARB) regarding its most recent workshop.

The Kansas Soybean Association represents soybean farmers in the state on domestic and international policy issues important to the soybean industry. It serves as the voice and advocate on local, state, national and international issues. U.S. soybean growers have long been committed to producing the world's food, feed, fuel, and thousands of bioproducts in a sustainable and climate-smart way.

As CARB revises and refines provisions in the Initial Statement of Reasons (ISOR) package, KSA is pleased to expand ASA's comments provided during the April 10 workshop. Of highest importance is ensuring that sustainability guardrails are workable for the soybean industry. Additionally, KSA requests that CARB update soybean land use change modeling that uses 20-year-old data and does not reflect current growing practices of our farmers. Given the recent federal tax guidance released in April on sustainable aviation fuel, there are also additional opportunities to develop LCFS policies that complement work being done at the federal level rather than create duplicative frameworks that create additional burdens on the biofuels value chain.

Positive Workshop Outcomes

KSA appreciates much of the work that CARB staff highlighted in the April 10 workshop. We agree that the robust public process that CARB has championed throughout the LCFS update work has offered significant opportunities for engagement. The workshop highlighted that liquid fuels will continue to be needed in the transportation sector in California for at least the next decade, and KSA believes the role of soy-based biofuels to lower emissions in today's remaining liquid fuel market is vitally important to help mitigate the impacts of climate change. Any mitigation action that can be implemented right now is better than similar action taken in the future.

CARB also noted that the Environmental Justice Advisory Committee's proposed agricultural feedstock cap would result in an increase in petroleum diesel usage. We appreciate that analysis done by CARB aligns with ASA conclusions in terms of the negative and perverse impacts of an agricultural feedstock cap.

Looking specifically at soybean oil prices and demand, KSA appreciates that CARB explored soybean oil price volatility in recent years and determined that it was not the result of domestic biofuels policy, but instead the result of several factors, including the war in Ukraine, weather, and other market disruptions. Further, CARB dispelled arguments that use of soybean oil for biofuels was impacting food prices and called this argument a "misleading representation" of the interaction between food and fuel.

We thank CARB for their work on this and offer ASA and our state association as resources for additional data related to this in the future.

088.4 KSA also appreciates CARB's additional attention on waste feedstock integrity. Imports of these feedstocks, especially used cooking oil, have exploded in the past couple of years due to incentives in California's LCFS. During much of this period, used cooking oil (UCO) was worth more than virgin palm oil. The increase in U.S. imports of UCO occurred after the EU started investigating fraud allegations as much of the trade was rerouted to the North American market. KSA encourages CARB to verify the integrity of imported UCO used in the LCFS to protect the integrity of the program for all participants.

Sustainability Guardrails: Exploring Additional Options

While CARB had mentioned sustainability guardrails broadly before, this workshop was the first time that staff detailed potential sustainability measures required for agricultural feedstocks. We believe this is a misguided undertaking.

088.5 Unfortunately, the information provided in the ISOR and presented in the April 10 workshop offer limited explanation as to why sustainability guardrails are required for agricultural feedstocks. CARB workshop slides state despite increasing domestic virgin oil supplies and uncertainty about increases in virgin oil biofuel consumption in California, "Guardrails [are] still warranted to reduce risks of potential impacts from increased demand of virgin oils in CA LCFS and inform other clean fuels program design."

088.6 It is not clear what risks remain that must be addressed. Total land use change risk is captured by the LUC score penalty from the GTAP model¹. From an aggregate standpoint, whether biofuels were produced from a U.S. acre in production in 2007 or thereafter is largely irrelevant for carbon intensity.

088.7 The total change in the system is the important component. Simply shifting eligibility among domestic acreage only adds costs without a program benefit or carbon reduction benefit.

088.8 It is also not clear what is meant by informing other clean fuels program design. Many other programs already account for land use change. We also are uncertain what role California plays in the regulatory affairs of other jurisdictions, like Kansas as an example. The total land use change in the U.S. for crops cannot exceed late 2007 levels under the federal Renewable Fuel Standard. This provision ensures that total crop acreage in the U.S. cannot expand for biofuels.

088.9 Without clearly demonstrated objectives, it remains difficult to devise suggestions for a program. Furthermore, other biofuels feedstocks consumed in California are generally not held to the same standard where they must prove they did not engage in a behavior that is already accounted for in the life cycle analysis. This in practice drives up the costs of agricultural feedstocks compared to other feedstocks and fuels, such as petroleum. In other words, it discourages the use of renewable diesel relative to diesel, which is detrimental to overall GHG emissions. If CARB insists that sustainability criteria for agriculture must be met, it should look to programs already developed through farmer input and provide improved scoring for feedstocks that employ sustainability practices to minimize the changes in comparative costs.

088.10 Based on the criteria outlined in the workshop and proposed third-party

088.11 audit scheme, KSA finds the proposal extremely problematic.

Aligning Sustainability Guardrails with Federal Initiatives

¹ https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/iluc_assessment/iluc_analysis.pdf

The recent tax guidance² for sustainable aviation fuel (40B) released by the Internal Revenue Service and Department of Treasury offers insights as to how CARB could offer improved scoring for feedstocks grown employing Climate Smart Agriculture practices. The 40B tax credit uses a new GREET methodology (40BSAF-GREET 2024), which shows soybeans offer a 55% emissions reduction, and can improve an additional 5% using limited CSA. The U.S. Department of Agriculture's Climate Smart Agriculture Pilot Program is currently collecting a myriad of outcomes-based data on agricultural improvements from farmers using CSA. Rather than penalizing agricultural feedstocks through an onerous audit system, CARB should consider providing additional emissions reductions to feedstocks employing CSA.

In January, a new Clean Fuel Production Credit (45Z) will go into effect, which we hope will build on the cover crops and no till practices included in 40B. Conservation tillage, crop rotations, sustainable inputs, precision agriculture, and other practices all help produce a more sustainable soybean. And many of these practices have been employed by the 12,000 soybean farmers across Kansas for many years. Acknowledging the work being done throughout U.S. soybean fields will ensure that CARB does not arbitrarily restrict sustainable feedstocks from its fuel portfolio.

A Critical Need for Stakeholder Engagement

Any agricultural sustainability criteria that CARB establishes will have significant impacts on how the soy industry and biofuels value chain operates. Hosting one workshop that included sustainability concepts did not provide enough of an opportunity for stakeholder engagement on this topic. KSA supports ASA's request that CARB convene a working group of industry stakeholders before finalizing sustainability criteria to ensure that the logistical limitations and financial impacts that could result from this policy are properly considered.

We encourage CARB to convene a working group that includes agricultural feedstock providers, feedstock processors, and biofuels producers to help develop any sustainability provisions that they would be required to implement. This working group should endeavor to flesh out workable sustainability guardrail provisions that CARB can implement by the second quarter of 2025. This would ensure that CARB develop a solution that does not unintentionally limit sustainable lipid-based feedstocks through onerous reporting requirements, while allowing CARB to continue to focus on implementation of the rest of the LCFS update by the end of 2024.

Updating Modeling for Soy Oil Feedstocks

KSA is also concerned that without a comprehensive update to the GTAP-BIO that CARB utilizes and that relies on 20-year-old data, soy-based feedstocks will be phased out of the LCFS, even though current data indicates a much lower carbon intensity (CI) score. On the one hand, CARB is recommending stringent sustainability guardrails for U.S. soy, but on the other hand is still on track to phase-out soy-based biofuels from credit generation by approximately 2035 or sooner.

CARB is updating all major models for lifecycle emissions calculations except for GTAP-BIO in this rulemaking. As mentioned above, the soy industry has made vast improvements in sustainability and efficiency over the past two decades, with even greater improvement goals ahead. At the same time, CARB continues to rely on a 2014 model that uses data from 2004. The ILUC score accounts for half or

² Department of Treasury and Internal Revenue Service. Notice 2024-37.

more of the CI score for soy-based biofuels. CARB's current modeling assigns soy biomass-based diesel with an ILUC impact of 29.1g CO₂e/MJ whereas updated results from the model used to calculate ILUC scores indicate a value of between 9 and 10 gCO₂e/MJ for soybeans³. The recently released 40BSAF-GREET 2024 model has an ILUC score of 12.2 for soy-based sustainable aviation fuel in federal programs. The benefits of the LCFS can only be achieved if CI values are accurately captured. If land use change concerns are large enough to justify sustainability guardrails, then the modeling should also be updated to reflect current land use change data. We urge CARB to update its GTAP model to align with other modeling changes being made.

Conclusion

088.15 The Kansas Soybean Association is encouraged by the continued successes of programs that support the development of cleaner, low-carbon fuels. California's LCFS has in turn supported rural economies that support the soy value chain. We appreciate the work that CARB has done to update and improve the LCFS. However, it is critical that CARB finalizes updates in a way that does not arbitrarily exclude agricultural feedstocks through onerous sustainability guardrails developed without the input of growers.

088.16
088.15 cont. KSA is eager to continue working with CARB to support the role of agriculture in diversifying the fuel supply and supporting cleaner fuel options in California and beyond. On behalf of Kansas soybean farmers, we appreciate the opportunity to comment and look forward to collaborating with CARB and other relevant stakeholders on implementation of policies that expand the use of soy-based biofuels and market opportunities for soybean farmers.

Sincerely,



Kaleb Little
Chief Executive Officer
Kansas Soybean Association

³ Taheripour, F., Karmai, O., and Sajedinia, E. (2023). *Biodiesel Induced Land Use Changes: An Assessment Using GTAP-BIO 2014 Data Base*. Purdue University

May 10, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95815

RE: Proposed Low Carbon Fuel Standard Amendments

Dear California Air Resources Board Members and Staff:

We respectfully submit the following addendum to our prior comments to the California Air Resources Board (CARB) on its proposed Low Carbon Fuel Standard (LCFS) Amendments, dated February 22, 2024, which call for equitable access to book-and-claim accounting for medium- and heavy-duty (MHD) electric vehicle (EV) charging microgrids involving hydrogen and renewable natural gas (RNG) energy sources.¹

About Prologis, Inc.

Headquartered in San Francisco, CA, Prologis, is the global leader in logistics real estate, with a portfolio of over 1.2 billion square feet across four continents and approximately 2.8% of global GDP flowing through our properties each year. Prologis leases modern warehousing and distribution facilities to customers, which include manufacturers, retailers, transportation companies, third-party logistics providers, and other enterprises. Our large, flat rooftops have enabled us to build out commercial solar installations to serve onsite and offsite load with clean energy and battery storage, helping our customers reduce their emissions and placing us second in the U.S. for corporate on-site solar.

Prologis' Mobility business is helping transform the fleet and logistics industry and enabling our customers to transition to zero-emissions through industry-leading electric vehicle (EV) charging technology and solutions. With roughly 180 million square feet of industrial real estate across our California portfolio, the opportunity for us to help our customers with this transition is significant, and we are developing dedicated charging infrastructure at Prologis sites to support their medium- and heavy-duty (MHD) fleets across last mile, drayage, and other applications. In addition to providing charging solutions at our own properties, we offer electrification services at non-Prologis buildings and are developing multi-fleet charging hubs serving areas with dense concentrations of warehouses.

Amend fueling supply equipment requirements to best serve MHD fleets

Prologis echoes the broader comments submitted today by the Joint MHD EV Infrastructure Parties, especially on removing the 250kW Fueling Supply Equipment (FSE) requirement and 10 FSE cap for an important additional reason: as FSE is currently defined in LCFS regulations, and depending on which equipment houses the energy meter, it could create an unintended MHD-Fast Charging Incentive (FCI) toward multi-port all-in-one cabinets when split architectures (dispensers separate from power cabinets) are critical technology catalog options for MHD projects. *(See Figure 1)*

¹ <https://www.arb.ca.gov/lists/com-attach/7026-lcfs2024-UCBUIF0zVmKkYwVi.pdf>

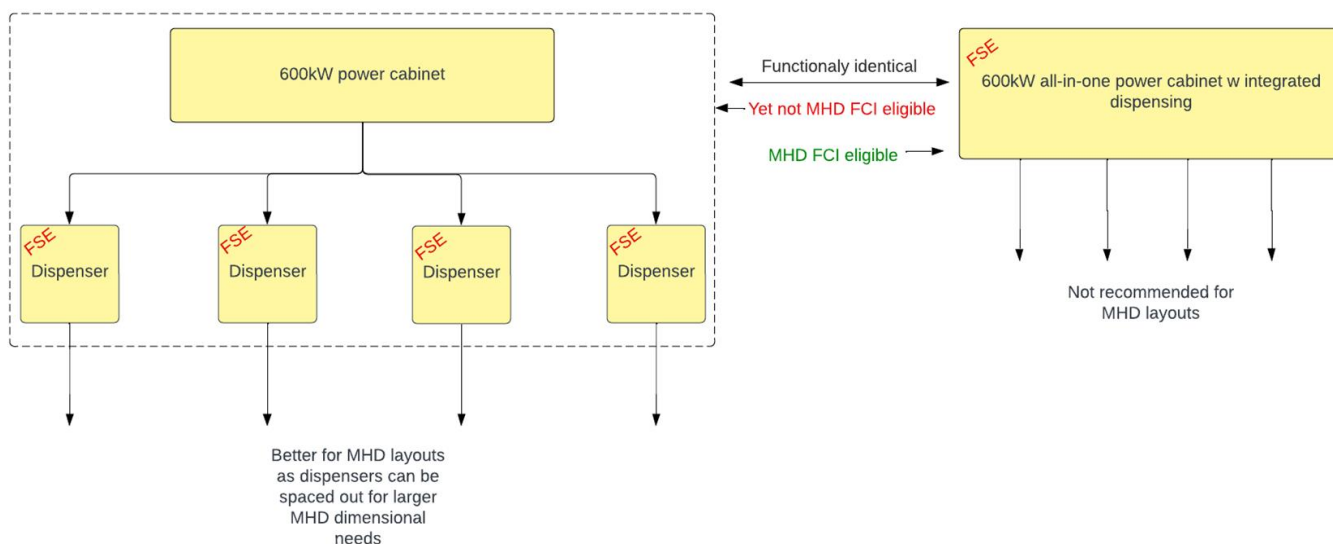


Figure 1 – Illustration of the issue caused by 250kW minimum FSE and 10 FSE maximum proposed rules in MHD-FCI

If the 250kW minimum FSE nameplate and maximum 10 count FSE per-site rules were to be adopted, it would create an unintended consequence where awkward, multi-port, all-in-one FSE designs qualify for MHD-FCI, but the functionally identical, and more ergonomic split-architecture alternatives would not. It is critical to not create this bias, as MHD layouts are significantly more sensitive to equipment placement and cable reach given the larger dimensions involved with these vehicles and the trailers that they are hauling. Site design varies widely based on MHD use case (dwell vs. corridor), and split-architecture infrastructure designs provide critical flexibility in our technology catalog for our customers. Simply removing the 250kW FSE minimum and 10 FSE maximum rules would solve the issue, while also allowing the market to self-determine how to best serve MHD fleet customers with the large-MW capacity platform of any given site.

Provide equal access to book-and-claim accounting for EV charging microgrids

We would also like to take this opportunity to reiterate the recommendations previously made by Prologis in earlier comments on revisions to LCFS, most recently in our letter dated February 20, 2024, regarding providing equitable access to book-and claim accounting for EV charging microgrids, as follows below, with one additional comment in red, as we are tracking additional technology pathways for producing hydrogen from biomethane.

Section §95488.8(i)(2)(A) states *“RNG injected into the common carrier pipeline in North America (and thus comingled with fossil natural gas) can be reported as dispensed as bio-CNG, bio-LNG, or bio-L-CNG, or as an input to hydrogen production, without regards to physical traceability.”*

MHD charging projects are in a difficult position: they are extremely capacity and energy intensive, second only to data centers in light-industrial real estate,² making them time-consuming to connect to the grid, yet they require accelerated schedules to meet fleet electrification mandates and avoid stranding EV assets. Projects in this predicament look to on-site generation with energy storage as a solution to meet fleet electrification objectives ahead of utility connections, with the added benefit of

² According to Prologis benchmarks of typical alternative uses for comparable properties

additional resiliency for critical fleet operations when the utility connection is eventually established in parallel. However, due to the exceptional energy intensity of industrial MHD charging projects on limited footprints, dispatchable power-dense on-site generation such as fuel cells or linear generators sometimes can be the only feasible technical solution that can fit the available real estate and meet the energy demand.

This important EV charging pathway for biomethane (whether RNG or hydrogen in its final delivered form for on-site generation) is not only a more energy efficient pathway for biomethane, but it also has significantly lower NOx emission profile than CNG vehicle application in sensitive disadvantaged communities around ports.³ Yet, only CNG vehicle fueling projects are incentivized with book-and-claim LCFS accounting from RNG energy sources.

As Prologis has recommended in prior comment letters, CARB should grant equitable access to biomethane book-and-claim LCFS accounting for MHD EV charging projects investing in on-site RNG/hydrogen generation that add resiliency and accelerate around transmission and distribution upgrade delays. We ask that CARB consider amending 95488.8(g)(1)(A)(2) to read as follows (changes in bold):

*“Biomethane supplied using book-and-claim accounting pursuant to section 95488.8(i)(2) and is claimed as feedstock in pathways for bio-CNG, bio-LNG, bio-L-CNG, hydrogen via steam methane reformation **or other methods, and electricity generation for co-located EV charging;**”*

Further, we suggest a revision of Section §95488.8(i)(2) to explicitly state:

*“(2) Book-and-Claim Accounting for Pipeline-Injected Biomethane Used as a Transportation Fuel or to Produce Hydrogen **or to generate Electricity**. Indirect accounting may be used for RNG used as a transportation fuel or to produce hydrogen **or to generate Electricity** for transportation purposes (including hydrogen that is used **either** in the production of a transportation fuel **or in the generation of electricity for transportation purposes**), provided the conditions set forth below are met:*

*(A) RNG injected into the common carrier pipeline in North America (and thus comingled with fossil natural gas) can be reported as dispensed as bio-CNG, bio-LNG, or bio-L-CNG, or as an input to hydrogen production, **or as an energy source for electricity generation**, without regards to physical traceability. Entities may report natural gas as RNG within only a three-quarter time span. If a quantity of RNG (and all associated environmental attributes, including a beneficial CI) is pipeline-injected in the first calendar quarter, the quantity claimed for LCFS reporting must be matched to natural gas sold in California as RNG no later than the end of the third calendar quarter. After that period is over, any unmatched RNG quantities expire for the purpose of LCFS reporting.*

*(B) Biomethane reported under fuel pathways associated with projects that break ground after December 31, 2029, injected into the common carrier pipeline, and claimed indirectly under the LCFS program for use as bio-CNG, bio-LNG, or bio-L-CNG in CNG vehicles or as an input to hydrogen production **or as an energy source for electricity generation** for transportation purposes, must demonstrate compliance with the following requirements:*

³ 0.059 gNOx/mile for a battery electric truck supported by linear generators vs. 0.317 gNOx/mile for a CNG truck per industry SME calculations provide to Prologis

*1. Starting January 1, 2041 for bio-CNG, bio-LNG and bio-LCNG pathways, and January 1, 2046 for biomethane used as an input to hydrogen production **or electricity generation**, the entity reporting biomethane must demonstrate that the pipeline or pipelines along the delivery path physically flow from the initial injection point toward the fuel dispensing facility at least 50 percent of the time on an annual basis. Entities may report natural gas as RNG within only a three-quarter time span. If a quantity of RNG (and all associated environmental attributes, including a beneficial CI) is pipeline-injected in the first calendar quarter, the quantity claimed for LCFS reporting must be matched to natural gas sold in California as RNG no later than the end of the third calendar quarter.*

After that period is over, any unmatched RNG quantities expire for the purpose of LCFS reporting.”

Prologis believes these recommendations will further enhance CARB’s proposed improvements to the LCFS program to align with the State’s transportation electrification goals and ensure they reflect the multiple use cases supporting logistics sector fleets, including both MHD-FCI Private and Shared charging, as well as address the realities of utility energization delays and resiliency risks for charging projects.

Thank you for considering our recommendations, and we welcome the opportunity to elaborate on our views with the Board and staff. Please do not hesitate to contact me at amoch@prologis.com or 571-895-5763 for more information or to discuss our comments in further detail.

Respectfully submitted,

Alexis Moch
Vice President, Government Affairs
Prologis



May 10, 2024

Rajinder Sahota
Deputy Executive Officer – Climate Change and Research
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Dear Ms. Sahota:

On behalf of the members of the American Coalition for Ethanol (ACE), I am writing in response to certain topics discussed during the April 10 workshop held by the California Air Resources Board (CARB) on the Low Carbon Fuel Standard (LCFS).

090.1 Specifically, I am writing in response to the proposed “sustainability criteria” for crop-based biofuels and the benefits approving E15 use in California.

Crop-Based Sustainability Criteria

090.2 The subject of sustainability criteria for crop-based biofuels is complex and consequential. ACE members do not believe CARB’s broad yet cursory proposal, nor the brief discussion of this topic during the April 10 workshop, warrant implementation of such criteria within the context of the overall LCFS amendments under consideration.

Rushing to implement such criteria could backfire. As we noted in our February 20 comment letter, the broad proposal to require pathway holders to track crop-based feedstocks to their point of origin and obtain independent third-party certification will discourage participation in the LCFS and hinder the goals of the program.

090.3 Instead, we recommend initiating a thoughtful stakeholder engagement process so all parties can better understand what CARB wants to accomplish through sustainability criteria. We believe this process can help surface the fact there are multiple existing protocols which can be relied upon to satisfy any real or perceived concerns related to ensuring the LCFS is not causing land use change (LUC) to forests, wetlands, and native prairies.

090.4

One such protocol is the “R&D Greenhouse Gases, Regulated Emissions, and Energy Use in Technologies (GREET) 2023 Rev1 Technical Report” on indirect effects of biofuels completed by the U.S. Department of Energy to help establish the 40B GREET model for the 40B sustainable aviation fuel (SAF) tax credit. The Department of Energy engaged Purdue University to generate results on induced land use changes (ILUC), crop production, livestock production, and rice production with its GTAP-BIO model, and ICF to develop emission profiles of crop production, livestock production, and rice paddy fields.¹

¹ <https://greet.anl.gov/files/greet-2023rev1-summary> April 2024. Development of R&D GREET 2023 Rev1 to Estimate Greenhouse Gas Emissions of Sustainable Aviation Fuels for 40B Provision of the Inflation Reduction Act.



Argonne modified R&D GREET 2023 to create an updated version, R&D GREET 2023 Rev1, that addresses the lifecycle GHG emissions associated with seven SAF pathways for 40B use. The technical report includes updates to ensure the indirect effects of four SAF pathways using dedicated feedstocks (corn, soybean, canola, and sugarcane) are covered. It can help inform questions CARB may have relative to indirect effects, including ILUC, from crop-based biofuels.

090.4
cont.

Second, since 1985, the United States Department of Agriculture (USDA) has been enforcing certain requirements ensuring farmers meet conservation requirements on croplands in order to be eligible for federal farm programs administered by USDA's Farm Service Agency (FSA), Risk Management Agency (RMA), and Natural Resource Conservation Service (NRCS). Known as "conservation compliance," Congress charged USDA with this responsibility to ensure that federal farm programs did not entice farmers to grow crops on highly erodible lands or convert wetlands for agricultural production.

Farmers who fail to abide by these rules are ineligible for federal farm programs including FSA loans and disaster assistance payments, NRCS and FSA conservation benefits, and Federal crop insurance support.

USDA has 40 years of experience enforcing these provisions. Under federal regulation, farmers and affiliated persons must affirmatively attest (form AD-1026) that they will not plant or produce an agricultural commodity on highly erodible land without following an NRCS approved conservation plan or system, plant or produce an agricultural commodity on a converted wetland, or convert a wetland which makes the production of an agricultural commodity possible. Additionally, activities that may affect compliance such as removing fence rows, combining fields, or conducting drainage activities must be pre-approved by USDA to ensure compliance.

090.4
cont.

USDA's FSA and NRCS are tasked with ensuring eligibility. Leveraging nearly 10,000 staff in state and county offices, NRCS is responsible for making the technical determinations of compliance at the farm level, and FSA's staff of nearly 7,000 state and county offices use this information to make program eligibility determinations for the covered programs. Farmers understand and accept this system. There is no need to re-invent the wheel. Instead, state and federal fuel programs should leverage USDA's infrastructure to verify desired sustainability criteria.

Speaking of federal fuel programs, third, as you know, the U.S. Environmental Protection Agency (EPA) is charged with enforcement of land use and total cropland acres relative to implementation of the Renewable Fuel Standard (RFS). This is yet another safeguard in place to prevent expansion of cropland for biofuel use.

Finally, ACE has previously written about a project we are engaged on with USDA's Regional Conservation Partnership Program (RCPP) to unlock corn ethanol access to LCFS markets and new tax incentives based on the adoption of climate-smart agricultural practices which reduce GHG emissions.

Michael Wang, Hao Cai, Uisung Lee, Saurajyoti Kar, Tom Sykora, and Xinyu Liu, Systems Assessment Center, Energy Systems and Infrastructure Analysis Division, Argonne National Laboratory



Under this project, we are leveraging USDA funding to help farmers adopt reduced tillage, nutrient management and cover crops on nearly 100,000 acres across 167 counties surrounding 13 ethanol facilities partnering with ACE to implement the project in a 10-state region of Illinois, Indiana, Iowa, Kansas, Minnesota, Missouri, Nebraska, Ohio, South Dakota and Wisconsin. The sites were strategically chosen to provide our project's scientific team with statistically significant data regarding the GHG effect of conservation practices in different soil types and climates.

ACE and our partners will accomplish three important objectives with this funding support from USDA. First, we will incentivize farmers in 10 states to adopt conservation practices. Three-fourths of the funding will go toward farmer adoption of practices. Second, our team of soil scientists and agronomists will monitor, measure and verify how the conservation practices adopted by the farmers reduce GHG emissions from corn production. The data they collect will be shared with the U.S. Department of Energy who will use it to pressure test existing models such as the GREET model to address real and perceived 'information gaps' which currently prevent farmers and ethanol producers from adequately monetizing climate-smart ag practices. Third, our ultimate objective is to empower ethanol producers and farmers with modeling and calculator tools to earn higher tax credits and premium prices in clean or low carbon fuel markets based on climate-smart ag practices.

Our partners, including 13 ethanol companies and team of technical experts, are currently making plans to ensure farmers in the 167 counties are aware of their eligibility and we hope to execute contracts for initial conservation practices following the 2024 fall harvest. This larger project is based on ACE's existing South Dakota RCPP, where we have nearly 20,000 acres in seven counties under contract for climate-smart ag practices.

090.5

While we may share CARB's goal for better understanding the GHG impacts farming practices have on crop-based biofuels, we disagree feedstocks such as corn must be tracked to their point of origin. Rather, GREET and other models CARB and other regulators use today to penalize corn ethanol for LUC and farm-level practices can be improved and modified to assign carbon credits based on climate-smart agriculture practices. Specifically, GREET currently estimates nitrous oxide emissions from fertilizer use, contains a module for estimating LUC penalties through the Carbon Calculator for Land Use Change from Biofuels (CCLUB), and features a relatively new Feedstock-Carbon Intensity Calculator (FD-CIC) module estimating soil carbon emissions and sequestration credits for practices such as conservation tillage and cover crops on corn production.

E15

090.6

While it is outside the scope of the proposed amendments to the LCFS, we were encouraged by discussion during the April 10 workshop about how E15 could help reduce retail pump prices. This is true. E15 typically costs 5 to 25 cents per gallon less than E10 and 40 cents to \$1.00 less than non-ethanol gasolines. E15 also has a higher octane rating, so allowing the sale of this fuel would give consumers the option to buy a higher quality product for less money. Moreover, 95 percent of all U.S. vehicles are approved to use E15 and nearly 3400 retail sites offer E15 across 30 states.



090.6
cont.

We implore CARB to finally approve the use of E15 in California, noting that the Center for Environmental Research and Technology at the University of California Riverside found that replacing E10 with E15 in California will significantly improve air quality.²

Thank you for your time and consideration of these comments.

Sincerely,

Brian Jennings, CEO
American Coalition for Ethanol

² <https://ww2arb.ca.gov/resources/documents/comparison-exhaust-emissions-between-e10-carfg-and-splash-blended-e15>

May 10, 2024

Submitted electronically via <https://ww2.arb.ca.gov/applications/public-comments>

Chair Liane Randolph and Board Members
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Tesla Comments on CARB's Low Carbon Fuel Standard Public Workshop (April. 10, 2024)

Dear Chair Randolph and Members of the Board:

Pursuant to the California Air Resources Board's (CARB's) Proposed Low Carbon Fuel Standards (LCFS) Amendments (Dec. 19, 2023) and Low Carbon Fuel Standard Public Workshop (April 10, 2024), Tesla respectfully submits the following comments. Tesla incorporates by reference its written comments in response to previous 2022 Scoping Plan and LCFS workshops and presentations.^{1 2 3 4} Tesla continues to support CARB and the state of California in defending the state's authority to implement the LCFS.

091.1

I. Background - Tesla's Mission

Tesla's mission is to accelerate the world's transition to sustainable energy. Moreover, Tesla believes the world will not be able to solve the climate change crisis without directly reducing air pollutant emissions - including carbon dioxide and other greenhouse gases - from the transportation and power sectors.⁵ To accomplish its mission, Tesla designs, develops, manufactures, and sells high-performance fully electric vehicles and energy generation and storage systems, installs, and maintains such systems, and sells solar electricity.⁶ Consistent with this effort, in May, 2023, Tesla was ranked as the world leader in the transition to vehicle electrification.⁷

II. Tesla Supports Strong Program Stringency (30% minimum by 2030) and a Greater Step Change Than Is Proposed⁸

¹ <https://ww2.arb.ca.gov/form/public-comments/submissions/3796>

² <https://www.arb.ca.gov/lists/com-attach/4195-scopingplan2022-BmVcO1IMAYMGYwBv.pdf>

³ https://www.arb.ca.gov/lispub/comm2/iframe_bccomdisp.php?listname=lcfs-wkshp-feb23-ws&comment_num=111&virt_num=98

⁴ <https://www.arb.ca.gov/lists/com-attach/7042-lcfs2024-AjBdb1VkVjcLP1Rk.pdf>

⁵ See, Tesla, Master Plan Part 3 (Apr. 5, 2023) available at https://www.tesla.com/ns_videos/Tesla-Master-Plan-Part-3.pdf

⁶ See, Tesla, Impact Report 2022 (Apr. 24, 2023) available at https://www.tesla.com/ns_videos/2022-tesla-impact-report-highlights.pdf

⁷ See, ICCT, The Global Automaker Rating 2022: Who Is Leading the Transition to Electric Vehicles? (May 31, 2023) available at <https://theicct.org/publication/the-global-automaker-rating-2022-may23/>

- 091.2 Tesla applauds CARB's long-term vision of setting a 90% reduction target by 2045. This cements California as the clear leader in the transportation decarbonization policy space, with the farthest-forward decarbonization target of any transportation decarbonization program globally. It also sets California on a path to reach Net Zero by 2045, as envisioned by Executive Order B-55-18. Currently, there are two principal factors in overcompliance that threaten the continuing stringency of the LCFS –
- 091.3 the accelerating use of both renewable diesel and renewable natural gas. As discussed below, CARB's decision not to limit these fuels results in the necessity of CARB implementing a more significant step change.
- 091.4 The compliance curve, step change, and auto acceleration mechanisms must all work in unison, and Tesla encourages CARB to increase the stringency of the 2030 target beyond 30% if the below recommended changes to the step-change and auto acceleration mechanism are not implemented. In the latest data release, the LCFS program achieves a 17.27% CI reduction from 2010 levels versus the 11.25% compliance curve, an overcompliance of 6%. This is the largest overcompliance in the program's history and this overcompliance is accelerating.
- 091.5 A leading cause of this overcompliance is the significant growth in renewable diesel consumption. In the latest workshop CARB signaled that it will not cap crop-based biofuels. Absent such a cap, the liquid diesel pool will grow and, with lower step downs, will harm the program's effective stringency. The latest data release showed the liquid diesel pool at a 66% renewable content at the end of 2023. A simple linear extrapolation of the past two years puts the diesel pool at 100% renewable in 2026. EIA data on PADD 5 renewable diesel consumption shows 2024 renewable diesel consumption accelerating even faster than the 2023 rate, indicating the liquid diesel pool could reach 100% in 2025.⁹ The EIA's analysis of existing and expected renewable diesel plant capacity shows that there is nearly double the amount of capacity needed for the California liquid diesel pool to reach 100%.¹⁰ Tankage and shipping constraints could slow the final few percentage points but the trajectory is clear: renewable diesel is on pace to completely displace fossil diesel in California. Once the liquid diesel pool reaches 100%, the surplus production will likely go into Sustainable Aviation Fuel, buoyed by the Inflation Reduction Act's Section 45Z credits starting in 2025. This will exacerbate the projected oversupply of LCFS credits. Thus,
- 091.6 in the absence of a crop-based biofuel cap, CARB should implement a more significant step change to address this credit oversupply issue. Accordingly, Tesla encourages CARB to adopt a 12% or higher step change – a position echoed by Neste, the world's largest producer of renewable diesel, in their February 20th comments.¹¹
- 091.7 Renewable Natural Gas (RNG) consumption continues to grow significantly as well, especially for negative CI dairy RNG, further creating a need for a more robust step change. In the latest workshop CARB signaled that it will not accelerate the phase out of Avoided Methane Crediting and will instead continue granting negative CI dairy pathways until 2030. Like renewable diesel, the latest data release showed Dairy RNG becoming the largest feedstock for CNG in 2023 with growth on pace to completely take over the pool; a simple 2-year linear extrapolations show dairy RNG becoming 100% of the feedstock pool for CNG by 2028. The absence of an accelerated phase out of Avoided Methane Crediting
- 091.8 further highlights the need for CARB to implement a more significant step change.

⁹ https://www.eia.gov/dnav/pet/pet_sum_snd_a_EPOORDO_mbbl_m_cur.htm

¹⁰ <https://www.eia.gov/todayinenergy/detail.php?id=55399>

¹¹ <https://www.arb.ca.gov/lists/com-attach/6974-lcfs2024-B2IUN1YkACcLaARb.pdf>

091.9 A critical issue impacting CARB's insufficient step change proposals is that CARB's models provided in the latest workshop¹² systematically under-estimate credit generation in the near-term. The six modeled scenarios all show renewable diesel consumption falling, in some cases to nearly half the current rate of consumption, between 2024 and 2030; in the absence of a crop-based biofuel cap, there is no reason to believe that renewable diesel consumption would decline in this timeframe. Similarly, the six modeled scenarios also show RNG volume declining between 2024 and 2030; again, in the absence of an accelerated phase out of Avoided Methane Crediting there is no reason to believe that RNG consumption would decline in this timeframe.

091.10
091.11 Additionally, the six modeled scenarios show light-duty electric vehicle charging not reaching the current rate of EV charging until 2026, again showing a systemic under-estimate of near-term credit production. Taken together, these systemic underestimates of near-term credit generation create a similar underestimation of the stepdown necessary to stabilize the LCFS program. Based upon clear trends in the marketplace and the gaps in the recent modeling, the proposed step change options of 5%, 7%, and 9% are clearly inadequate.

091.12
091.13 The market reaction to CARB's recent proposal is also indicative of its inadequacy. Credit prices have fallen to their lowest level since the program began trading in 2015, indicating that the market has socialized CARB's proposed step change options and does not believe that a 5%, 7%, or 9% step-change is stringent enough to materially affect credit oversupply.

In sum, the current LCFS market is not functioning in a sustainable manner. There is simply a glut of credits on the market that has driven down pricing, making the LCFS less supportive of electrification efforts in California. Unfortunately, CARB's proposal does not do enough to address this existential threat to the program. The clear near-term solution is implementation of a step change of at least 12%, as quickly as possible.

III. Restart the Clean Fuel Reward (CFR) Program

091.14 CARB should also restart the CFR program quickly. The revenue intended for the CFR program is currently pooling up at the electric utilities instead of incentivizing and accelerating consumer adoption of electric vehicles (EV). EV sales are entering difficult terrain as the market transitions from early adopters to mainstream buyers and the current high interest rate environment means these cash incentives matter now more than ever.

091.15 In restarting the CFR program, CARB should ensure that the incentive is a meaningful enough amount to move consumer behavior. Under the current proposal, CARB would switch most of the CFR revenue to a medium- and heavy-duty vehicle incentive while also leaving the door open for a smaller, light-duty incentive. Tesla's modeling indicates that splitting the base credit revenue between a light-duty CFR and a medium/heavy duty CFR would result in on-the-hood incentives that would be too small to effectuate significant behavior change in either category. To effectively transition the vehicle market, the CFR program should dedicate the applicable base credit revenue to only one vehicle sector - either light-duty or medium/heavy duty.

¹² <https://ww2.arb.ca.gov/resources/documents/supplemental-2023-lcfs-isor-documentation>

CARB should also recognize that automakers are best positioned to successfully manage a restarted CFR program. Manufacturers enjoy comparatively strong relationships with consumers and act as primary distributors of information regarding the consumer and environmental benefits of EVs. Automakers know more about their delivery and sales plans than anyone and can leverage that knowledge to better forecast CFR program expenses. Automakers also have direct access to the best data on home charging rates and can leverage that data to better forecast CFR program revenues.

As a path forward, Tesla has worked with other OEMs to develop a program structure that is workable and would eliminate many of the issues burdening the prior CFR program. In short, this plan consists of:

- A) Committing all CFR revenue towards light duty incentives;
- B) Put all EVs on the road before Jan. 1, 2025, into a “community pool.” A 3rd party administrator would receive the base credits from those vehicles and sell the credits;
- C) The significant CFR revenue currently unused by the utilities would go to the community pool;
- D) OEMs would receive base credits from their fleets sold after Jan. 1, 2025; and
- E) If any OEM has a CFR outlay shortfall greater than their base credit revenue, the OEM will receive a “make whole” payment from the community pool administrator (ensuring automakers are not punished for rapidly expanding their EV sales).

IV. Trigger the Automatic Acceleration Mechanism (AAM) Off of 2025 Data

CARB should set up the AAM to trigger off 2025 data, allowing for the first year of AAM implementation in 2026, rather than 2027 as proposed in the draft regulations.

V. Update the Light Duty BEV Energy Efficiency Ratio (EER)

CARB should update the Energy Efficiency Ratio (EER) for Light Duty Battery Electric Vehicles (LD BEV). The current 3.4 EER was adopted by CARB in 2011 and has not been updated in the 13 years since. California now lags other jurisdictions which have more accurate EERs, such as The Netherlands (4.0 EER)¹³, The European Union (4.0 EER)¹⁴, and Canada (4.1 EER).¹⁵ As described in our previous comment, a more thorough analysis would likely result in an EER over 4.0.¹⁶

VI. Remove the Unnecessary Third-Party Verification for Non-Residential EV Charging

Proposed section 95501 of the amendments includes a proposal to expand third-party verification for EV charging transactions. While Tesla appreciates the intent of CARB staff’s proposal, it is unnecessary to create a separate third-party verification program regime for non-residential electricity transactions related to EV charging. Commercial EV charging infrastructure transactions fall under the purview of the

¹³ <https://www.rijksoverheid.nl/documenten/kamerstukken/2022/12/22/beantwoording-kamervragen-over-wijziging-van-de-stimuleringsfactoren-in-de-regeling-energie-vervoer>

¹⁴ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32023L2413&qid=1699364355105>

See also, https://www.europarl.europa.eu/doceo/document/ITRE-AM-729929_EN.pdf

¹⁵ Page 86 of the Specifications for Fuel LCA Model CI Calculations, <https://datadonnees.az.ec.gc.ca/data/regulatee/climateoutreach/carbon-intensity-calculations-for-the-clean-fuelregulations/en/Resources/?lang=en>

¹⁶ <https://www.arb.ca.gov/lists/com-attach/7042-lcfs2024-AjBdb1VkVjcLP1Rk.pdf>

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CA Department of Agriculture, Division of Measurement Standards (DMS), under its state weights and measures program. CA DMS is responsible for verifying the accuracy of commercial EV charging infrastructure in California. This includes both a field verification process carried out by the CA counties as well as type evaluation program. It is unnecessary for LCFS to add additional verification requirements given the accuracy of commercial EV charging transaction is already regulated and verified in CA. We therefore recommend that no additional third-party verification is necessary for EV charging transactions.

VII. Expeditious Amendment to the LCFS Supports the Energy Transition in California

091.20

The LCFS program in California is a crucial component of the transition of California's transportation system from fossil fuels to zero emission vehicles. Lower LCFS prices will cause many EV charging companies to re-evaluate whether to expand deployment of DC Fast Chargers in California or instead to focus on other markets.

The ultimate end-goal of the energy transition is to move from fossil fuels to Zero Emission Vehicles (ZEVs). Biofuels are a transition fuel to get California to a fully ZEV economy. Biofuels like renewable diesel and renewable natural gas are buoyed by the federal RFS, which does not extend to ZEV technologies like EV charging and hydrogen. In the absence of higher LCFS prices, we will see a longer period of transition where California is dependent on biofuels (with associated air pollution and land use change effects) while pushing out the ultimate transition to ZEVs. Accordingly, CARB should act expeditiously to ensure the program curve is based on updated data; and that the amendments ensure appropriate emissions reductions, program, stability, and active marketplace - that provides revenue to companies to invest in the acceleration of the energy transition in California.

Respectfully submitted,



Joseph Mendelson III
Senior Counsel
Public Policy & Business Development



PACT

May 10, 2024

Chair Liane M. Randolph
California Air Resources Board
1001 I Street
Sacramento, CA 95815

Comments of Powering America’s Commercial Transportation (“PACT”) on the Proposed Amendments to the Low Carbon Fuel Standard

Chair Randolph:

Powering America’s Commercial Transportation (“PACT”) appreciates the opportunity to provide comments in response to the April 10, 2024, workshop and, more broadly, on the California Air Resources Board (“CARB”) proposed Low Carbon Fuel Standard (“LCFS”) Amendments.

I. Introduction

092.1

PACT is encouraged to see CARB’s focus on medium- and heavy-duty (“M/HD”) charging, and its recognition of the unique nature of power, location, and site design of such charging stations. PACT strongly supports the creation of the MHD-FCI program and proposes modifications to the provision to maximize the benefits of the program according to key industry stakeholders.

II. About PACT

PACT is a coalition dedicated to accelerating the development and deployment of reliable nationwide charging infrastructure for medium- and heavy-duty zero emission vehicles (“M/HD ZEVs”).¹ Our membership comprises stakeholders across the transportation electrification ecosystem, including leading truck manufacturers, charging infrastructure technology providers and developers, commercial fleets, fleet management companies, and utilities. PACT is committed to promoting productive cross-sector collaboration to advance policies and regulations that improve access to and reduce barriers for M/HD charging infrastructure.

¹ PACT membership comprises ABB E-mobility, BC Hydro, Burns & McDonnell, Chateau Energy Solutions, Daimler Truck North America, EV Realty, Geotab, Greenlane, InCharge, InductEV, J.B. Hunt Transport, Inc., Mortensen, Navistar Inc., Penske, Pilot Flying J, PittOhio, Prologis, Voltera, WattEV, Volvo Group North America, and Zeem Solutions.



III. PACT's Regulatory Engagement

PACT is engaged in multiple regulatory settings that have touchpoints on the LCFS rulemaking. PACT's regulatory engagement includes:

- Party status to the California Public Utilities Commission ("CPUC") proceeding on the Rulemaking Regarding Transportation Electrification Policy and Infrastructure² through which PACT submitted reply comments.³ Notably, utilities are responsible for implementing LCFS holdback credit programs which are the dual jurisdiction of CARB and the CPUC. PACT is exploring opportunities to provide LCFS strategy recommendations within this rulemaking, and envisions opportunities to further explore M/HD infrastructure investments.
- Party status to the CPUC proceeding on the Rulemaking to Establish Energization Timelines,⁴ through which PACT submitted opening and reply comments to the rulemaking,^{5,6} and opening comments⁷ on the Scoping Memo.⁸

Moreover, PACT is evaluating further engagement with state agencies, including with the California Energy Commission, on issues such as EV charging reliability and interoperability, as well as data collection (e.g., capacity mapping).

PACT stands ready to work with CARB and its sister agencies to support the industry in achieving the State's Advanced Clean Trucks ("ACT") and Advanced Clean Fleets ("ACF") goals, through the accelerated rollout of M/HD fleets and its attendant infrastructure.

² Order Instituting Rulemaking Regarding Transportation Electrification Policy and Infrastructure (R. 23-12-008) Issued Dec. 20, 2023.

³ Reply Comments of PACT on Order Instituting Rulemaking Regarding Transportation Electrification Policy and Infrastructure (Served and Filed Feb. 5, 2024) <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M524/K929/524929719.PDF>

⁴ Order Instituting Rulemaking to Establish Energization Timelines (R. 24-01-18) Issued Jan. 25, 2024.

⁵ Opening Comments of PACT Order Instituting Rulemaking to Establish Energization Timelines (Served and Filed Feb 20, 2024) <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M525/K574/525574167.PDF>

⁶ Reply comments of Powering Americas Commercial Transportation on Order Instituting Rulemaking to Establish Energization Timelines (Served and Filed Mar. 1, 2024) <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M526/K553/526553989.PDF>

⁷ Opening Comments of PACT on the Assigned Commissioner's Scoping Memo and Ruling in the Order Instituting (Served and Filed May 3, 2024) <https://efile.cpuc.ca.gov/FPSS/0000206073/1.pdf> Rulemaking to Establish Energization Timelines.

⁸ Assigned Commissioner's Scoping Memo and Ruling (R. 24-01-19) Filed Mar. 28, 2024.



IV. Association with Other Comments

PACT agrees with comments provided by multiple stakeholders, including the Joint MHD EV Infrastructure Parties and others as referenced throughout our comments, and offers additional suggestions with respect to public and private infrastructure crediting. Specifically, PACT aligns with parties in the following areas:

092.2

- Support for the creation of a MHD-FCI program;
- Support for an increase in the overall MHD-FCI program size;
- Support for the holdback credit investments in M/HD;
- Eliminate geographical restrictions for crediting eligibility;
- Eliminate the FSE cap; and
- Adjust the minimum nameplate power rating.

In addition to the comments provided by the Joint MHD EV Infrastructure Parties (and other stakeholders), PACT provides a series of recommended modifications that would strengthen the M/HD sector's ability to leverage the benefits of the program. These recommendations are intended to provide the M/HD industry with both market flexibility and are structured to encourage innovation. PACT positions on each of these items is further detailed below.

V. Support for MHD-FCI Program

092.3

PACT members applaud CARB's leadership for developing a first-of-kind capacity credit program for the M/HD sector, and encourage CARB to expedite the passage of the MHD-FCI provision. The MHD-FCI provision will send clear market signals to the M/HD sector and its stakeholders that the industry can feel confident that the support needed to advance M/HD ZEVs will be available. The staff's proposal to create the MHD-FCI program will play a key role in ensuring that more investments are made in M/HD ZEVs and the requisite charging infrastructure.

PACT agrees with parties who have highlighted that the LCFS has the potential to be a paradigm-shifting resource to help California meet its electrification targets ratified in the Advanced Clean Trucks ("ACT") and Advanced Clean Fleets ("ACF") regulations,⁹ and its decarbonization goals. While the Proposed Amendments would help fund M/HD ZEV infrastructure, further modifications are warranted, which will unlock further potential of the

⁹ Parties include the Joint M/HD EV Infrastructure Parties, Environmental Defense Fund



PACT

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program to accelerate the deployment of critical ZEV technologies. PACT believes that with the incorporation of recommended adjustments, the overall effectiveness of the program will be substantially increased.

VI. Increase in the Overall MHD-FCI Program Size

PACT appreciates CARB's efforts to support M/HD ZEVs by creating the M/HD-FCI program. The Board has an opportunity to be even more forward leaning in this effort, however, by incorporating the following recommendations.

Increase MHD-FCI Program Cap

092.4

PACT agrees with parties who have proposed increasing the MHD-FCI program cap from 2.5% of previous quarter deficits to a minimum of 5% of previous quarter deficits.¹⁰ As noted by the Joint MHD EV Infrastructure Parties, the 2.5% cap would not support the modest load projection of 2,900 MW of M/HD charging estimated by 2025.

To meet California's ambitious targets, fleets and FSE providers will need certainty that the available incentives will adequately scale to support the deployment of sufficient infrastructure. Increasing the cap will act as a means to further incentivize the buildout of infrastructure needed to support future M/HD ZEV adoption.

Support for Public and Private Crediting Eligibility

PACT appreciates CARB's recognition that M/HD charging infrastructure crediting should include private infrastructure due to the steep initial costs associated with the initial buildout of infrastructure and the unique refueling needs of truck fleets, among other factors.

092.5

PACT encourages CARB to consider creating credit parity between private and public infrastructure investments by equalizing the credits earned for both private refueling infrastructure and public refueling infrastructure, per charging station. As mentioned above, CARB's staff proposal acknowledges the critical nature of private charging credits to the success of M/HD charging generally. To meet California's regulatory mandates, trucks refueling at private depots and trucks refueling at public stations will both need the necessary infrastructure to continue operations. Furthermore, with respect to meeting regulatory and air quality targets, the benefits provided by electric trucks do not depend on whether the charging infrastructure

¹⁰ Parties include Joint M/HD EV Infrastructure Parties, NRDC, Voltera.



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used is public or private. Whereas lowering credit eligibility for private charging would ultimately hamper California's ability to meet its own regulatory targets, establishing this suggested parity will help set uniform market signals, which in turn will better help achieve these goals.

Additionally, offering equal crediting eligibility for private as public charging will bring the LCFS more in line with current operational needs, which are diverse across the M/HD sectors, and vary across many use cases and business needs. Equal treatment for public and private charging infrastructure will expand the anticipated climate and revenue benefits of the LCFS program and incentivize maximum participation.

VII. Support for Holdback Credit Investments in M/HD

092.6

PACT is encouraged by the staff's proposed amendments to the holdback equity credit investments, which specify opportunities for utilities to use holdback credits for a diverse array of M/HD investments. PACT appreciates this expanded list, which will encourage wider and more diverse utility investments in the transportation electrification sector. With respect to M/HD fleets and infrastructure, PACT supports the staff proposal to expand LCFS rebates for drayage vehicles to include other M/HD or off-road vehicles and investments in grid-side distribution infrastructure. PACT also supports the staff proposal to require that at least 75% of such credits be invested in transportation electrification.

The CPUC decision concerning holdback revenue utilization, developed in consultation with CARB, determined that holdback credits should be focused on funding for transportation electrification programs that address equity and resiliency.¹¹ Funding for M/HD electrification projects is an appropriate use for holdback credits because M/HD electrification will create e-miles which have considerable equity benefits for all communities and corridors where M/HD ZEV fleets travel.

VIII. Widely Interpret the Locational Benefits of M/HD ZEVs on Disadvantaged Communities

There is an existing overlap between disadvantaged communities and where M/HD electrification will largely take place. For example, disadvantaged communities often overlap with industrial centers and ports, as well as key corridors and arterials. These communities inherently experience an outsized environmental impact from truck and bus operation.

¹¹ California Public Utilities Commission, Decision Concerning Low Carbon Fuel Standard Holdback Revenue Utilization, R.18-12-006 (Dec. 21, 2020).



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092.7

Electrifying the M/HD sector will naturally support mitigating the adverse environmental impacts of M/HD trucking in these communities. This applies to both charging sites as well as the vehicles themselves. For these reasons, locational or geographic requirements are not necessary. While PACT acknowledges the unique air quality challenges of disadvantaged communities, PACT also recognizes that projects need not be directly in a specific community to provide benefits to that community.¹² PACT also supports CalETC's recommendation to update the definition of "rural."¹³ Aligning the definition of "rural" with the U.S. Census bureau's will create more opportunities for potential equity benefits as M/HD ZEVs operate in a variety of communities—not just urban areas—depending on the vehicle use case.

092.8

In addition to potentially building a stronger alignment with the state's overarching disadvantaged communities policies, adopting this broader definition of "rural" may provide more "territorial" flexibility to the Electrical Distribution Utilities ("EDUs") to use holdback credits (to invest in, for example, grid-side distribution infrastructure for M/HD ZEVs) in the areas where the EDUs anticipate the potential for the greatest equity impact.

IX. Eliminate Geographical Restrictions on MHD-FCI Eligibility

092.9

To promote flexibility for the M/HD-FCI sector, PACT encourages CARB to reject the 1-mile requirement for capacity credits.¹⁴ PACT favors greater flexibility for stakeholders to identify site locations based on their market demand and applicability to business needs. In this regard, PACT aligns with other parties and encourages CARB to not adopt the staff's proposed geographic limitations on M/HD-FCI eligibility.¹⁵

The M/HD ZEV market is growing, but still nascent and as such needs an adaptable approach. As noted by the Energy Commission, there were only 3,784 M/HD ZEVs at the end of 2023

¹² SMUD, Sacramento Municipal Utility District's Comments on the Proposed Amendments to the Low Carbon Fuel Standard, page 7; PG&E, PG&E Comments on the Proposed Amendments to the Low Carbon Fuel Standard Regulation, page 3

¹³ CalETC, SUPPORT Proposed Amendments to the Low Carbon Fuel Standard Regulation, page 7

¹⁴ Section § 95486.3(b)(1)(B)2 in the Proposed Regulation Order states that the proposed MHD-FCI chargers must be "Located within one mile of a reading or pending electric vehicle Federal Highway Administration Alternative Fuel Corridor or on or adjacent to a property used for medium or heavy-duty vehicle overnight parking, or has received capital funding from a State or Federal competitive grant program that includes location evaluation as criteria."

¹⁵ Parties include Joint M/HD EV Infrastructure Parties, Southern California Edison, CalETC and Electric Vehicle Charging Association ("EVCA"), NRDC



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(with approximately 2,000 buses, 850 trucks, and 870 delivery vans deployed). For Classes 6-8, which is PACT's focus, the number falls to approximately 760 trucks.¹⁶

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In addition, mileage limitations may unduly disqualify potential site investments that are otherwise optimal for the M/HD operational model when considering land availability, land cost, energy capacity, and other factors. We share CARB's vision of accelerating fleet electrification, particularly in those places with the highest levels of truck traffic today, and believe added flexibility will support this objective by facilitating faster, lower-cost infrastructure deployment serving key freight hubs and connecting corridors. Further, the mileage limitation may create unintended consequences. As SCE and CalETC capture, the potential impact of this constraint could unintentionally trigger additional utility upgrades because developers will be incentivized to prioritize corridor proximity over existing grid capacity when making siting decisions.^{17,18} These upgrades would add costs and delays to the EV transition, including higher costs for ratepayers at a time when high electricity rates are already a cause for concern.

Moreover, the policy climate is rapidly evolving around M/HD charging, which suggests the need for flexibility at this critical and early stage. For example, the recently-released National Zero-Emission Freight Corridor Strategy "guides infrastructure deployment to meet growing market demands; catalyze public and private investment; and support utility and regulatory planning and action at local, state, and regional levels."¹⁹ This strategy will have a substantial impact on freight electrification, particularly around project siting and resource allocation. The strategy focuses initially on key freight hubs serving first-mover fleets with return-to-base operations and the hubs are defined broadly, with a 100-mile radius and no mention of any specific distance (e.g., one mile) from the corridors. We see value in aligning California policy with this strategy by giving greater flexibility to build out charging ecosystems in and around key hubs in addition to charging serving corridors.

It is too early to project whether the majority, or a significant portion of "first movers" in M/HD electrification would be captured by strict geographical requirements like the one proposed. In fact, the most likely first movers would be hampered by this proposal. For example, use cases such as short haul, hub-and-spoke operations, drayage, middle mile, and last mile deliveries are

¹⁶ California Energy Commission: Medium- and Heavy-Duty Zero-Emission Vehicles in California https://tableau.cnra.ca.gov/t/CNRA_CEC_PUBLIC/views/MDHDVehiclesPop/MDHD?%3Adisplay_count=n%3Aembed=y%3AisGuestRedirectFromVizportal=y%3Aorigin=viz_share_link%3AshowAppBanner=false%3AshowVizHome=n

¹⁷ SCE Support for Low Carbon Fuel Standard Regulation Amendments with Some Proposed Modifications and Clarifications

¹⁸ CalETC and EVCA, SUPPORT Proposed Amendments to the Low Carbon Fuel Standard Regulation, at page 12.

¹⁹ [National Zero-Emission Freight Corridor Strategy \(driveelectric.gov\)](#) at page iii.



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not likely to overlap neatly with a corridor charging focus, which is more conducive to long-haul trucking operations. As CALSTART captures in their comments, M/HD ZEV charging does not necessarily mirror conventional fueling, and charging for the aforementioned use cases can often be located where these vehicles are in use or otherwise domiciled.²⁰

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PACT also agrees with the Joint MHD EV Infrastructure Parties that such a geographic restriction would have further unintended consequences for fleet electrification. PACT's members include large national fleets pursuing zero-emissions solutions in California. Cost considerations are a driver for where, how, and when to electrify certain segments of the fleets. In addition to cost, fleets must navigate a slew of other issues such as power availability, zoning, permitting, and site size and design. Establishing a 1-mile boundary would artificially push fleet depots where the incentives are available. This would lower the available real estate for charging depots, further concentrate electric utility load, and drive-up costs for depot properties within the 1-mile boundary. Finally, customers should be enabled to find locations that would not potentially require multi-year grid upgrades. The 1-mile boundary constraints customers from selecting sites where there may actually be more capacity available for faster, less costly build-out. Siting infrastructure where there is existing grid capacity is critical for fleets looking to rapidly electrify their operations.

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Should CARB determine that removing the 1-mile boundary is unacceptable, PACT aligns with parties who have recommended the boundary be expanded to at least 5-miles.²¹ Operational needs and project economics are sufficient to ensure that infrastructure will go to areas with high truck traffic and significant potential for near-term emissions benefits.

X. Eliminate FSE Caps

PACT supports the Joint MHD EV Infrastructure Parties recommendation to strike Section §95486.3(b)(2)(D), which establishes a limit of 10 eligible FSEs per application within a quarter mile.

092.11

PACT members, particularly fleets and FSE providers, are building and planning depots of all sizes, the vast majority of which are larger than 10 FSEs. Many fleets operating in California have more than 10 vehicles that would need to be transitioned to M/HD ZEVs. This proposed provision would be a significant impairment to the deployment of M/HD infrastructure, and would have a number of unintended consequences, particularly with the quarter-mile designation. As noted by the Joint MHD EV Infrastructure Parties, a steep rate of growth is

²⁰ CALSTART, SUPPORT Proposed Amendments to the Low Carbon Fuel Standard Regulation, at page 3.

²¹ Parties include Joint M/HD EV Infrastructure Parties, CalETC and EVCA, NRDC.



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required to meet ACT and ACF targets. Artificially hampering the build-out of large private depots is counter directional to CARB's goals.

XI. Adjust Minimum Nameplate Rating

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The proposed amendments would create a minimum nameplate power rating of 250 kW per-FSE.²² FSE providers and fleets should have flexibility to plan for power levels that accelerate the deployment of M/HD EVs at scale and PACT aligns with other parties who have called for the removal of this requirement.²³ PACT aligns with other parties who have noted that not all M/HD ZEV use cases will require chargers with a nameplate capacity of 250 kW or higher. Furthermore, as other parties have also stated, developers are, and should have the flexibility to, utilize a mix of charging speeds at depots to provide customers with the option for overnight or long dwell charging—which also offers a potentially more cost effective solution for fleets who can utilize this charging model.²⁴ This again highlights the need to encourage flexibility so that customers are able to choose the right charging option that works for their operational needs. Removing the minimum nameplate requirement will encourage market flexibility, which is critically important for achieving the State's decarbonization goals.

As an alternative to removing the minimum 250 kW requirement, PACT aligns with other parties who have suggested lowering the minimum requirement to 150 kW.²⁵

XII. Conclusion

PACT looks forward to continuing to work with CARB to maximize the potential benefits of the MHD-FCI program. PACT applauds CARB for the development of the MHD-FCI provision, and encourages CARB to strengthen the provision by:

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- *Increasing the overall size of the MHD-FCI program.* PACT recommends that the program be adjusted to increase the cap from 2.5% of previous quarter deficits to a minimum of 5% of previous quarter deficits and to provide equal treatment for public and private charging infrastructure.
- *Expanding opportunities for utilities to use holdback credits for M/HD investments.* PACT supports the staff proposal to expand LCFS rebates for drayage vehicles to include

²² Section §95486.3(b)(1)(E) in the Proposed Regulation Order states that “Each FSE at an MHD-FCI site must have a minimum nameplate power rating of 250kW.”

²³ Parties include Environmental Defense Fund, Voltera, CalETC and EVCA, Joint M/HD EV Infrastructure Parties

²⁴ Parties include Joint M/HD EV Infrastructure Parties, CalETC and EVCA, NRDC

²⁵ Parties include Joint M/HD EV Infrastructure Parties, CalETC and EVCA, Voltera, EDF



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other M/HD or off-road vehicles and investments in grid-side distribution infrastructure and the staff proposal to require that at least 75% of such credits be invested in transportation electrification.

- *Eliminating the geographical restrictions for crediting eligibility.* PACT recommends that the 1-mile requirement be removed from the MHD-FCI program. Should the Board find this proposal unacceptable, PACT would encourage the Board to adjust the requirement to 5 miles.
- *Eliminating the FSE cap.* PACT recommends eliminating the 10 FSE-per site cap in order to promote market flexibility and innovation.
- *Adjusting the minimum nameplate power rating.* PACT recommends removing the minimum nameplate rating to promote market flexibility and better align with existing and future business operations. Should the Board find this proposal unacceptable, PACT recommends lowering the minimum requirement to 150 kW.

PACT stands in strong support for the proposed MHD-FCI program, including the holdback credit investments in M/HD, and looks forward to future engagement with CARB on these matters.

Sincerely,

PACT

/s/

David Bonelli

Partner

Venable LLP

On behalf of PACT

May 10, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95814

Via electronic submission

Re: Comments on April 10 Low Carbon Fuel Standard Workshop

The North Dakota Soybean Growers Association (NDSGA) appreciates the opportunity to provide comments in response to the April 10 Low Carbon Fuel Standard (LCFS) workshop. The NDSGA is an affiliate of the American Soybean Association (ASA) and welcomes the chance to engage with the California Air Resources Board (CARB) regarding its most recent workshop.

NDSGA represents North Dakota soybean farmers on domestic and international policy issues important to the soybean industry. U.S. soybean growers have long been committed to producing the world's food, feed, fuel, and thousands of bioproducts in a sustainable and climate-smart way.

093.1

As CARB revises and refines provisions in the Initial Statement of Reasons (ISOR) package, NDSGA is pleased to expand ASA's comments provided during the April 10 workshop. Of highest importance is ensuring that sustainability guardrails are workable for the soybean industry. Additionally, NDSGA requests that CARB update soybean land use change modeling that uses 20-year-old data and does not reflect current growing practices. Given the recent federal tax guidance released in April on sustainable aviation fuel, there are also additional opportunities to develop LCFS policies that complement work being done at the federal level rather than create duplicative frameworks that create additional burdens on the biofuels value chain.

Positive Workshop Outcomes

093.2

NDSGA appreciates much of the work that CARB staff highlighted in the April 10 workshop. We agree that the robust public process that CARB has championed throughout the LCFS update work has offered significant opportunities for engagement. The workshop highlighted that liquid fuels will continue to be needed in the transportation sector in California for at least the next decade, and NDSGA believes the role of soy-based biofuels to lower emissions in today's remaining liquid fuel market is vitally important to help mitigate the impacts of climate change. CARB also noted that the Environmental Justice Advisory Committee's proposed agricultural feedstock cap would result in an increase in petroleum diesel usage.

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We appreciate that analysis done by CARB aligns with ASA conclusions in terms of the negative and perverse impacts of an agricultural feedstock cap.

Looking specifically at soybean oil prices and demand, NDSGA appreciates that CARB explored soybean oil price volatility in recent years and determined that it was not the result of domestic biofuels policy, but instead the result of several factors, including the war in Ukraine, weather, and other market disruptions. Further, CARB dispelled arguments that use of soybean oil for biofuels was impacting food prices and called this argument a "misleading representation" of the interaction between food and fuel.

NDSGA thanks CARB for their work on this and offers ASA and our state association as resources for additional data related to this in the future.

093.4 NDSGA also appreciates CARB's additional attention on waste feedstock integrity. Imports of these feedstocks, especially used cooking oil (UCO), have exploded in the past couple of years due to incentives in California's LCFS. During much of this period, used cooking oil was worth more than virgin palm oil. The increase in U.S. imports of UCO occurred after the EU started investigating fraud allegations as much of the trade was rerouted to the North American market. NDSGA encourages CARB to verify the integrity of imported UCO used in the LCFS.

Sustainability Guardrails: Exploring Additional Options

093.5 While CARB had mentioned sustainability guardrails broadly before, this workshop was the first time that staff detailed potential sustainability measures required for agricultural feedstocks. NDSGA understands that CARB must balance liquid fuel market demands with environmental sustainability goals in California. However, we believe that it is important to work with the biofuels value chain to develop an outcome that is economically and logistically viable for the industry.

093.6 Unfortunately, the information provided in the ISOR and presented in the April 10 workshop offer limited explanation as to why sustainability guardrails are required for agricultural feedstocks. CARB workshop slides state despite increasing domestic virgin oil supplies and uncertainty about increases in virgin oil biofuel consumption in California, "Guardrails [are] still warranted to reduce risks of potential impacts from increased demand of virgin oils in CA LCFS and inform other clean fuels program design." It is not clear what risks remain that must be addressed. Total land use change risk is captured by the LUC score penalty from the GTAP model¹. From an aggregate standpoint, whether biofuels were produced from a U.S. acre in production in 2007 or thereafter is largely irrelevant for carbon intensity. The total change in the system is the important component. Simply shifting eligibility among domestic acreage only adds costs without a program benefit.

093.8 It is also not clear what is meant by informing other clean fuels program design. Many other programs already account for land use change. We also are uncertain what role California plays in the regulatory affairs of other jurisdictions, like North Dakota. The total land use change in the U.S. for crops cannot exceed late 2007 levels under the federal Renewable Fuel Standard. This provision ensures that total crop acreage in the U.S. cannot expand for biofuels. Furthermore, CARB's Global Trade Analysis Project model for biofuels (GTAP-BIO) assumed 812 million gallons of soy-based biofuels are consumed in state whereas California only consumed 378 million gallons in 2023. Last of all, announcements for crush plant expansion in the U.S. total about a 30% increase in domestic capacity. Even if all of these plants were built, that translates to about 15% of the U.S. soybean crop, and the country currently exports 40 to 50% of the soybean crop.

093.10 Without clearly demonstrated objectives, it remains difficult to devise suggestions for a program. Furthermore, other biofuels feedstocks consumed in California are generally not held to the same standard where they must prove they did not engage in a behavior that is already accounted for in the life cycle analysis. This in practice drives up the costs of agricultural feedstocks compared to other feedstocks and fuels, such as petroleum. In other words, it discourages the use of renewable diesel

¹ https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/iluc_assessment/iluc_analysis.pdf

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cont. relative to diesel, which is detrimental to overall GHG emissions. If CARB insists that sustainability criteria for agriculture must be met, it should look to programs already developed through farmer input and provide improved scoring for feedstocks that employ sustainability practices to minimize the changes in comparative costs. Based on the criteria outlined in the workshop and proposed third-party audit scheme, NDSGA finds the proposal problematic.
- 093.12
- 093.13

Aligning Sustainability Guardrails with Federal Initiatives

- 093.14 The recent tax guidance² for sustainable aviation fuel (40B) released by the Internal Revenue Service and Department of Treasury offers insights as to how CARB could offer improved scoring for feedstocks grown employing Climate-Smart Agriculture (CSA). The 40B tax credit uses a new GREET methodology (40BSAF-GREET 2024), which shows soybeans offer a 55% emissions reduction, and can improve an additional 5% using limited CSA. The U.S. Department of Agriculture's Climate Smart Agriculture Pilot Program is currently collecting a myriad of outcomes-based data on agricultural improvements from farmers using CSA. Rather than penalizing agricultural feedstocks through an onerous audit system, CARB should consider providing additional emissions reductions to feedstocks employing CSA.

In January, a new Clean Fuel Production Credit (45Z) will go into effect, which we hope will build on the cover crops and no till practices included in 40B. Conservation tillage, crop rotations, sustainable inputs, precision agriculture, and other practices all help produce a more sustainable soybean. Crop rotation is a standard practice in North Dakota. More than one-half of N.D. soybean acres are planted in a no-till system, often part of a precision agriculture practice. Acknowledging the work being done throughout U.S. soybean fields will ensure that CARB does not restrict sustainable feedstocks from its fuel portfolio.

A Critical Need for Stakeholder Engagement

- 093.15 Any agricultural sustainability criteria that CARB establishes will have significant impacts on how the soy industry and biofuels value chain operates. Hosting one workshop that included sustainability concepts did not provide enough of an opportunity for stakeholder engagement on this topic. NDSDGA supports ASA's request that CARB convene a working group of industry stakeholders before finalizing sustainability criteria to ensure that the logistical limitations and financial impacts that could result from this policy are properly considered.

We encourage CARB to convene a working group that includes agricultural feedstock providers, feedstock processors, and biofuels producers to help develop any sustainability provisions that they would be required to implement. This working group should endeavor to flesh out workable sustainability guardrail provisions that CARB can implement by the second quarter of 2025. This would ensure that CARB develops a solution that does not unintentionally limit sustainable lipid-based feedstocks through onerous reporting requirements, while allowing CARB to continue to focus on implementation of the rest of the LCFS update by the end of 2024.

Updating Modeling for Soy Oil Feedstocks

- 093.16 The NDSGA is also concerned that without a comprehensive update to the GTAP-BIO that CARB utilizes and that relies on 20-year-old data, soy-based feedstocks will be phased out of the LCFS, even though current data indicates a much lower carbon intensity (CI) score. On the one hand, CARB is

² Department of Treasury and Internal Revenue Service. Notice 2024-37.

recommending stringent sustainability guardrails for U.S. soy, but on the other hand is still on track to phase-out soy-based biofuels from credit generation by approximately 2035 or sooner.

093.16
cont.

CARB is updating all major models for lifecycle emissions calculations except for GTAP-BIO in this rulemaking. As mentioned above, the soy industry has made vast improvements in sustainability and efficiency over the past two decades, with even greater improvement goals ahead. At the same time, CARB continues to rely on a 2014 model that uses data from 2004. The ILUC score accounts for half or more of the CI score for soy-based biofuels. CARB's current modeling assigns soy biomass-based diesel with an ILUC impact of 29.1g CO₂e/MJ whereas updated results from the model used to calculate ILUC scores indicate a value of between 9 and 10 gCO₂e/MJ for soybeans³. The recently released 40BSAF-GREET 2024 model has an ILUC score of 12.2 for soy-based sustainable aviation fuel in federal programs. The benefits of the LCFS can only be achieved if CI values are accurately captured. If land use change concerns are large enough to justify sustainability guardrails, then the modeling should also be updated to reflect current land use change data. NDSGA urges CARB to update its GTAP model to align with other modeling changes being made.

Conclusion

093.17

NDSGA is encouraged by the continued successes of programs that support the development of cleaner, low-carbon fuels. California's LCFS has in turn supported rural economies that support the soy value chain. We appreciate the work that CARB has done to update and improve the LCFS. However, it is


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critical that CARB finalizes updates in a way that does not arbitrarily exclude agricultural feedstocks through onerous sustainability guardrails developed without the input of growers.

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cont.

NDSGA is eager to continue working with CARB to support the role of agriculture in diversifying the fuel supply and supporting cleaner fuel options in California and beyond. On behalf of North Dakota soybean farmers, we appreciate the opportunity to comment and look forward to collaborating with CARB and other relevant stakeholders on implementation of policies that expand the use of soy-based biofuels and market opportunities for soybean farmers.

Sincerely,



President,
North Dakota Soybean Growers Association

³ Taheripour, F., Karmai, O., and Sajedinia, E. (2023). *Biodiesel Induced Land Use Changes: An Assessment Using GTAP-BIO 2014 Data Base*. Purdue University



Tanya M. DeRivi

Senior Director, California Climate and Fuels

May 10, 2024

Ms. Rajinder Sahota
Deputy Executive Officer – Climate Change and Research
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Uploaded at:
<https://ww2.arb.ca.gov/public-comments/low-carbon-fuel-standard-workshop-april-10-2024>

Re: WSPA Comments on April 10, 2024, Low Carbon Fuel Standard Workshop

Dear Ms. Sahota,

The Western States Petroleum Association (WSPA) appreciates the opportunity to comment on the California Air Resources Board's (CARB) April 10, 2024, workshop to discuss potential refinements of staff's proposed "45-day" Low Carbon Fuel Standard (LCFS) program regulatory proposal. WSPA is a non-profit trade association representing companies that import and export, produce, refine, transport and market petroleum, petroleum products, alternative fuels, natural gas, and other energy supplies in California and four other western states, and has been an active participant in air quality planning issues for over 30 years.

As CARB has emphasized, the LCFS program "offers an essential tool to reduce pollution now" by supporting the continued development of lower-carbon intensity (CI) fuels.¹ Consistent with this program, WSPA member companies have made significant investments into these lower-CI fuels, which are responsible for *"replacing over 50% of the diesel used in the state in the first quarter of 2023."*² However, while this program has many benefits overall, it is also important to note that the LCFS program comes with a cost—this program is specifically designed to achieve greater emissions reductions from transportation fuels over time by effectively taxing higher-CI fuels while subsidizing lower-CI fuels.³ CARB must account for these costs in considering program revisions.⁴ The California Energy Commission recently developed detailed cost disclosure information for the LCFS program, including the cost adder as required by statute.⁵

094.1

WSPA is proud of the technological advancements our member companies have made in bringing more renewable diesel, biodiesel, hydrogen, biomethane, and electricity to California's transportation fuels market since LCFS came into effect. As CARB has recognized, these advancements have *"drawn investment, business and jobs and has helped to make California a leader in innovative clean fuels development and production."*⁶

WSPA has engaged with CARB throughout the informal and formal LCFS rulemaking processes,

¹ CARB, "For first time 50% of California diesel fuel is replaced by clean fuels," August 23, 2023 at <https://ww2.arb.ca.gov/news/first-time-50-california-diesel-fuel-replaced-clean-fuels#:~:text=California%20Air%20Resources%20Board,-Main%20navigation&text=SACRAMENTO%20E2%80%93%20California%20hit%20an%20important,the%20first%20quarter%20of%202023>.

² *Id.*

³ See Legislative Analyst's Office report, "Assessing California's Climate Policies – Transportation," December 2018, page 29 at <https://lao.ca.gov/reports/2018/3912/climate-policies-transportation-122118.pdf>.

⁴ See Cal. Health & Safety Code (HSC) § 38560 (requiring regulations to be "cost-effective").

⁵ See California Energy Commission (CEC), "California Oil Refinery Cost Disclosure Act Monthly Report," updated monthly at <https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/california-oil-refinery-cost-disclosure>.

⁶ CARB, "For first time 50% of California diesel fuel is replaced by clean fuels," August 23, 2023 at <https://ww2.arb.ca.gov/news/first-time-50-california-diesel-fuel-replaced-clean-fuels#:~:text=California%20Air%20Resources%20Board,-Main%20navigation&text=SACRAMENTO%20E2%80%93%20California%20hit%20an%20important,the%20first%20quarter%20of%202023>.

and previously submitted comments in response to CARB's 2022, 2023, and 2024 LCFS workshops and proposed regulatory updates. Those comments are incorporated into this letter by reference and are also attached.^{7, 8, 9, 10, 11, 12, 13}

094.4 Given the significant outstanding issues remaining with CARB's proposed program revisions, WSPA recommends that CARB host an additional workshop on the pre-15-day language. This will help address previously identified and unresolved implementation issues for the proposed crop-based feedstock guardrails and obligating intra-state jet fuel use to provide stakeholders with an adequate opportunity to address these issues. CARB should not attempt to introduce new and complex topics such as the "Land Use Change Evaluation – Initial Concept" this late into the rulemaking process. While we understand that CARB staff would like to finalize this rulemaking for Board adoption by year-end, it is essential for CARB to finalize revisions that are both aligned with statutory requirements and *implementable* to ensure the continued success of the LCFS program. Providing additional opportunity for public engagement will support this long-term development. In addition, WSPA reiterates here that obligating intrastate jet fuel as a deficit-generator will not bring additional "Sustainable Aviation Fuel" into California because it can otherwise be met with credits from any lower-CI fuel source.¹⁴

Need to Support Availability of Lower-Carbon Fuels for Californians

094.6 WSPA continues to support CARB's decision *not* to include arbitrary caps on crop-based feedstocks or fuels derived from crop-based feedstocks. A cap would limit proven emissions reductions strategies that are working today and ultimately increase statewide transportation emissions given the demand for liquid fuels will continue well into the future. Any concept of a cap on a specific fuel type would also directly conflict with California Health and Safety Code (HSC) § 38560's mandate that CARB adopt measures "to achieve the maximum technologically feasible and cost-effective greenhouse gas emission reductions from sources."¹⁵ For the same reasons, any such cap would also likely run afoul of HSC § 38562's requirement to consider "diversification of energy sources, and other benefits to the economy, environment, and public." Caps would also represent a significant programmatic change without adequate technical justification.

- 094.7 • **Sustainability Guardrails.** WSPA does not believe that CARB's recently proposed "guardrails" will help incentivize the production of additional lower-CI fuels; therefore, "guardrails" should not be included in the LCFS program. CARB explains that these guardrails are intended to "reduce the risk that rapid expansion of biofuel production and biofuel feedstock demand could result in deforestation or adverse land use change."¹⁶
- 094.8 However, CARB still has not provided data demonstrating that there is such a sustainability issue that must be addressed.¹⁷ Details of the concept were first provided to stakeholders

⁷ WSPA, "WSPA Comments on CARB Workshop to Discuss Potential Changes to the LCFS," August 8, 2022.

⁸ WSPA, "WSPA Comments on the August 18th CARB Workshop to Discuss Potential Changes to the LCFS," September 19, 2022.

⁹ WSPA, "WSPA Comments on the November 9th CARB Workshop regarding Potential Changes to LCFS," December 21, 2022.

¹⁰ WSPA, "WSPA Comments on CARB Preliminary Discussion Draft of Potential Low Carbon Fuel Standard Regulation Amendments and February 22, 2023 LCFS Workshop," March 15, 2023.

¹¹ WSPA, "WSPA Comments on CARB's Proposed Low Carbon Fuel Standard Auto-Acceleration Mechanism and May 23, 2023 Workshop," June 6, 2023.

¹² WSPA, "WSPA Comments on the Low Carbon Fuel Standard Modeling Updates Workshop," September 12, 2023.

¹³ WSPA, "WSPA Comments on Proposed 2024 Low Carbon Fuels Standard Amendments," February 20, 2024.

¹⁴ WSPA, "WSPA Comments on Proposed Low Carbon Fuels Standard Amendments," February 20, 2024.

¹⁵ See also HSC § 43018.

¹⁶ CARB, LCFS 2023 Amendments, Initial Statement of Reasons (ISOR), December 19, 2023 at 32, <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/isor.pdf>.

¹⁷ See Cal. Gov. Code § 11346.2(b)(1) (requiring the agency to submit "A statement of the specific purpose of each adoption, amendment, or repeal, the problem the agency intends to address, and the rationale for the determination by the agency that each adoption, amendment, or repeal is reasonably necessary to carry out the purpose and address the problem for which it is proposed."); see also § 11349.1(a)(1) (requiring the agency to review its regulations and make determinations based off the regulation's "necessity.").

094.8 cont.

when the 45-day package was released, and the April 10, 2024, workshop provided little new information into how CARB sees the process working to address its intended purpose. It is therefore troubling that CARB could propose further refinements in imposing “sustainability guardrails” that may, as a result, limit the supply of crop-based feedstocks for biofuels and potentially increase costs.

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As WSPA has previously emphasized, creating an entirely new crop-based biofuel certification regime by 2028 will be daunting, is unjustified, and will only further add to the already overly burdened CARB staff and regulated entities. CARB should defer adding these requirements until a future rulemaking when staff can thoroughly vet such concept(s) with stakeholders, address incorporating “climate smart” agricultural practices, and to ensure any new requirements are aligned with other jurisdictions to ensure consistency and to preserve overall market stability. If CARB decides to include these certification regimes, WSPA urges CARB to align requirements with programs in other jurisdictions, such as Canada’s Clean Fuel Regulation, to ensure consistency and to preserve market stability.

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- **Proposed Land-Use Change (LUC) Values Under Consideration.** WSPA also objects to new, additional revisions on a complex topic such as LUC being inserted into this rulemaking process at such a late juncture for the following reasons:
 - These changes were not included, nor contemplated, in CARB’s formal January 2024 proposal.
 - CARB has not adequately solicited public feedback on any methodology being considered.¹⁸ Incorporating input from the public and regulated industry would be more consistent with existing LCFS procedures and is necessary to determine whether the methodology being considered is appropriate.
 - CARB has not yet presented evidence that “high-risk crop-based feedstocks” exist.

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Ongoing Concerns for Newly Obligated Intrastate Fossil Jet Fuel & Reporting Requirements

WSPA remains extremely concerned that the proposed LCFS Amendments would eliminate the existing exemption for intrastate fossil jet fuel and make fuel importers and producers the First Fuel Reporting Entity beginning in 2028. Given the evolving nature of this proposal, the ongoing requests by some stakeholders regarding applicability to *interstate* jet fuel, and the complexity of inserting such a significant new obligation into the Regulation, WSPA urges CARB to host a dedicated workshop to discuss any implementation challenges stakeholders have raised. If not, WSPA strongly urges CARB to retain the exemption, or make aircraft operators (which include passenger airlines, aircraft cargo companies, and small aircraft owners) the First Fuel Reporting Entity as originally proposed.

Fuel importers and producers lack sufficient information to meet these new reporting requirements. They have no ability to differentiate between intrastate, interstate, and international fuel usage¹⁹ and CARB has not proposed a definition for intrastate jet fuel consumption. As written, CARB’s proposal will sweep in a broad range of fueling operations outside *intrastate* jet fuel consumption and impose significant new reporting burdens on entities that have minimal connections to California. We continue to be concerned that CARB’s proposal may impermissibly burden *interstate* commerce in

¹⁸ See Cal. Gov. Code §11346.45(a) (requiring the agency to hold discussions with the public “when the proposed regulations involve complex proposals or a large number of proposals that cannot easily be reviewed during the comment period.”); §§ 11346.2(b)(3)-(4) (requiring identification of any technical documents relied upon by the agency and the consideration of “reasonable alternatives” and the agency’s reason for rejecting alternatives,” respectively.); see also HSC § 38560.

¹⁹ Interestingly, there is no consideration that some fossil jet fuel imported or produced in California may also be used in military applications. There is no evaluation of whether this is a legally permissible scope for LCFS or whether fuel producers and importers could reasonably expect to be provided with information about the end use of such fuel, given the classified nature of such information.

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violation of the Dormant Commerce Clause doctrine.²⁰ By regulating aviation fuels, CARB's proposal impacts the instrumentalities of interstate transportation and impedes the flow of interstate commerce. Aircraft operators are far better positioned to report on their fuel usage and can better ensure that the reported information is accurate. As a result, aircraft operators possess relevant information to support reporting, including:

- How each individual operator(s) use the fuel supplied to the airport storage facility;
- Which plane the fuel is uploaded into; and
- The flight path of each plane (including those scheduled to take off and land within the State of California).

Some of this information may be considered confidential business information, which WSPA believes should not be shared with fuel producers and importers. The ripple effect of adding the intrastate jet fuel obligation may include aircraft operators re-optimizing flights to flight paths to include additional fueling outside of California, reducing intrastate jet fuel consumption; this would contribute to emissions leakage. Under Assembly Bill (AB) 32 (2006), CARB has an obligation to minimize leakage resulting from its regulatory activities.²¹

Increased Step-Downs Compromise LCFS Program Cost-Effectiveness & Feasibility

In addition to previously proposing several updates to increase the LCFS program's stringency, CARB is now re-evaluating those CI benchmarks – to accelerate them even further. While we appreciate the meritorious intent of doing so, WSPA is also concerned about the equally important consideration that doing so will likely impact California's gasoline prices. The State of California has previously acknowledged^{22,23} – and does currently acknowledge²⁴ – that the LCFS program *does have* a direct cost impact to California consumers, which can disproportionately burden low- and moderate-income Californians the most. Any significant cost increases will also clearly conflict with SB X1-2 (2023), which directed State agencies to evaluate measures ***“to ensure a reliable supply of affordable and safe transportation fuels in California.”***²⁵

WSPA is concerned that further accelerating the CI target benchmarks may exacerbate California's pressing energy affordability challenges. Constraining credit generation opportunities for more affordable fuels (e.g., imposing new limits and regulatory burdens on crop-based biofuels) directly conflicts with the very fuels CARB credits with achieving sizable air emission benefits *today*. In addition, it can be reasonably assumed that pushing prices up towards the LCFS program's price ceiling would result in *“potential adverse impacts to California consumers.”*²⁶ We urge CARB to heed this recognition and re-double efforts to find more cost-effective means of achieving emissions benefits. **A technology-neutral approach is the best means of maximizing cost-effectiveness in a market-based program** and would better align with CARB's rulemaking obligations under California Government Code § 11346.2(b)(4)(A), which includes performance-based standards as an alternative to a technology mandate.

²⁰ *Pike v. Bruce Church, Inc.*, 397 U.S. 137, 142 (1970).

²¹ HSC § 38562(b)(8).

²² CARB, LCFS 2023 Amendments, Standardized Regulatory Impact Assessment, September 8, 2023 at 58, <https://dof.ca.gov/wp-content/uploads/sites/352/2023/09/LCFS-SRIA-to-DOF-ADA-Compliant> (estimates that the proposed amendments to the LCFS program will potentially increase the price of gasoline by an average of \$0.37 per gallon between 2024 and 2030, and further increase the price of gasoline by \$1.15 per gallon between 2031 and 2046.).

²³ See Legislative Analyst's Office report, “Assessing California's Climate Policies – Transportation,” December 2018 at 30, <https://lao.ca.gov/reports/2018/3912/climate-policies-transportation-122118.pdf>.

²⁴ See CEC, Senate Bill (SB) X1-2 Refiner Margin Data at <https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/california-oil-refinery-cost-disclosure>.

²⁵ SB X1-2 (2023) (emphasis added) at https://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=202320241SB2.

²⁶ CARB, LCFS 2020 Amendments, ISOR, October 1, 2019 at II-2, <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2019/lcfs2019/isor.pdf>.

Measures that undermine the program's cost-effectiveness violate HSC § 38560, which requires CARB to ensure that its program amendments are cost-effective. Similarly, HSC § 43018 requires CARB to adopt only necessary, cost-effective, and technologically feasible regulations. California Government Code § 11346.2(b)(4) also requires CARB to consider "*reasonable alternatives to the regulation that would lessen any adverse impact on small business,*" and reasonable alternatives that are "*less burdensome.*" As part of these alternatives, CARB must consider "*overall societal benefits, including reductions in other air pollutants, diversification of energy sources, and other benefits to the economy, environment, and public health.*"²⁷ To comply with these provisions, WSPA urges CARB to **revise its potential program amendments to create a more cost-effective, less burdensome regulatory program** that protects a diverse energy portfolio, including for those fuels that are today contributing to significant emissions reductions efforts.

The original package of 45-day amendments would set more stringent CI reduction targets, increasing the 2025 CI target by a 5% near-term step down, increasing the 2030 CI reduction target from 20% to 30%, and adding a 2045 CI target of 90%. It would also add a triggering mechanism, the Automatic Acceleration Mechanism (AAM), which would advance the CI standard in a given year to a future year if specified market conditions are met, in order to bridge periods of credit surplus and maintain a steadier program signal. Under the proposed updates, CARB has modeled alternative near-term step downs of either 5% with two AAM triggers, 7%, or even 9% in the initial years of implementation. Rather than "super accelerate" reductions, CARB should adopt more achievable CI reduction targets in order to mitigate potential consumer cost impacts and encourage longer-term advancements in transportation fuel development:

- *First*, "super-accelerating" near-term program stringency may compromise the goal to balance the costs the economy bears, and the environmental benefits received. Market signals are necessary to incentivize the production of lower-CI fuels. But CARB's aggressive proposed reduction targets may exacerbate California's pressing energy affordability challenges.
- *Second*, CARB illustrated in its Standardized Regulatory Impact Assessment²⁸ a significant reliance on banked credits to achieve its proposed targets, resulting in a dramatic credit bank draw-down, leaving little time for regulated entities to innovate and bring additional lower-CI fuels to market that will add credits to the market and stabilize costs. WSPA has previously raised the need to incorporate a reset mechanism to ensure a modeled target does not become a model of how not to achieve emission reductions. A reset mechanism would bring greater regulatory certainty and strike an appropriate balance between achieving meaningful reductions and offering sufficient business, technology, and financial support to industry. A reset mechanism would also help ensure that these accelerated targets are durable and achievable.
- *Third*, CARB has provided little to no insight into its expectations on the impact of fuels that will shortly go from credit generators to deficit generators. The impact of this change on markets and the ability of some fuel *supplies* to manage this transition could significantly impact the LCFS program.
- *Fourth*, given the significant implications associated with the AAM – especially if it could be triggered twice in rapid succession – WSPA recommends that CARB reconsider it as part of this rulemaking and instead seek more dedicated input from stakeholders. CARB's hypothetical scenario of triggering the AAM twice and the predicted minimum bank draw down demonstrates the need to reconsider the AAM, or at the very least, to incorporate a reset mechanism to avoid unintended adverse impacts of an AAM, such as potentially drawing down more credits than are available.

²⁷ HSC § 38562.

²⁸ LCFS SRIA at: <https://dof.ca.gov/wp-content/uploads/sites/352/2023/09/LCFS-SRIA-to-DOF-ADA-Compliant.pdf>

- 094.21
- *Fifth*, “super-accelerating” LCFS program stringency will likely run counter to efforts underway before the California Energy Commission under SB X1-2 to identify ways to ensure an affordable and reliable supply of transportation fuels. WSPA has provided extensive comments about the need to address policies that constrain supply despite ongoing and very high demand for transportation fuels. In particular, if electrification of the light-duty vehicle pool does not grow as quickly as CARB envisions, the deficits generated by CARBOB (petroleum gasoline) will grow significantly and there will not be enough credits to offset the deficits, and the LCFS program as a whole will become infeasible.
- 094.22
- *Finally*, WSPA continues to encourage CARB to incorporate a robust consultation process with relevant stakeholders (e.g., fuel providers and distributors) to better understand potential issues and consider the possible unintended consequences during an annual review and before triggering the AAM. CARB premises these very aggressive CI reduction targets on the assumption that gasoline demand (and, therefore, CARBOB demand) is expected to decline quickly with an increase in light duty ZEV penetration. However, if ZEV penetration does not take place as quickly as CARB anticipates, the LCFS deficit generation will be significantly higher than CARB's scenarios and the program could become infeasible.

Preserve Support for Biomethane Crediting

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Rather than limit crediting for biomethane under the LCFS program, we encourage CARB to look for ways to *establish* credit. As CARB seeks to focus biomethane use in hydrogen production and non-transportation uses, WSPA believes that the most appropriate way to do so is to establish incentives that encourage use in those applications, rather than by creating uncertainty and establishing bad precedent by removing incentives elsewhere. Such an approach is more likely to slow or even reverse investments in methane capture projects, and stranding investments. This approach also runs counter to existing programs incentivizing the development of projects to address Short-Lived Climate Pollutants. *Instead*, CARB should be looking for ways to *establish*

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crediting mechanisms, such as by removing the limit on book-and-claim treatment for biomethane used for process energy in refineries and crude production facilities.

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WSPA believes that avoided methane crediting is needed to support current and future investments and project development. These credits for methane – which was previously emitted or flared – are key components of dairy renewable natural gas investments and should be preserved to ensure the maximum production of lower-CI fuels and emission reductions.

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Finally, to be consistent with CARB’s 2022 Scoping Plan Update, the agency must first identify where emissions reductions will come from to replace those that are currently being realized through avoided methane crediting. More work must be done before eliminating existing incentives that currently achieve real reductions in emissions.

Preserve Support for Ethanol Development

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WSPA reiterates the need for CARB to ensure that any proposed amendments do not burden ethanol development. The 45-day regulatory language is overly broad and may require ethanol feedstocks to meet the newly proposed “sustainability guardrails” certification regime and tracking requirements, which would significantly increase the cost and burden of ethanol, thus disincentivizing ethanol development. This would conflict with HSC § 38560’s mandate that CARB adopt measures “*to achieve the maximum technologically feasible and cost-effective greenhouse gas emission reductions from sources.*” Ethanol is critical for achieving lower-CI for gasoline with limited to no substitutes for ethanol to achieve today’s CI reductions. CARB should therefore clarify

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that any new sustainability requirements *do not* apply to ethanol, and account for costs related to

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ethanol production and importation in assessing the program amendments.

CA-GREET 4.0 Updates

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To maintain consistency in the program and to minimize disruption, current pathways should remain open during the transition from GREET 3.0 to GREET 4.0. CARB should justify any incremental nitrous oxide (N₂O) emissions from renewable diesel and biodiesel before implementing these incremental emissions in GREET 4.0, and not just simply assume that renewable diesel and biodiesel have the same N₂O emissions as petroleum diesel.

Supply Update Assumptions / Refined Supply Curves

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While we appreciate that CARB has based its transportation fuel mix projections in the proposed revisions on the 2022 Scoping Plan Update, it is still important that CARB plans for a scenario where these ambitious goals are not easily achieved. For example, reductions in Vehicle Miles Traveled (VMT) have fallen short of the ambitious targets in the Scoping Plan due to structural issues and challenges in changing behavior. Likewise, the LCFS program faces challenges in reducing

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consumer demand for liquid transportation fuels due to ongoing permitting challenges, investment constraints, and growing electricity affordability concerns towards rapidly electrifying the transportation sector and buildings, which lead to continued reliance (and potentially increased reliance) on liquid fuels. Also, in recent quarters, as recently reported by the California Energy Commission,²⁹ zero emission vehicle (ZEV) demand has declined for three straight quarters, which may result in higher liquid fuel demand, and therefore higher LCFS deficit generation, than CARB's modeled assumptions.

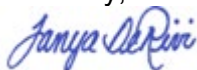
Transportation Fuel Mix and Fuel Volumes Assumptions

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The proposed VMT reduction targets in CARB's draft 2022 Scoping Plan Update were 12% below 2019 levels by 2030 and 22% below by 2045 – presumably significant factors in CARB's modeling. The Recirculated Environmental Assessment to that Scoping Plan included *even more* aggressive VMT reductions. CARB's staff presentation, on slides 22 and 23, reflects a significant decrease in transportation energy usage from 2022 to 2045 despite the State's previous failure to achieve VMT reductions under Senate Bill (SB) 375 (2008). WSPA notes that the increased use of lower-CI fuels could provide GHG reductions with much greater certainty than VMT reduction assumptions. Particularly given that these types of VMT reductions are dependent on factors outside of CARB's purview (e.g., employment rates, fuel prices, job and housing balances, and availability of affordable housing).

WSPA appreciates the opportunity to provide these comments.

Sincerely,



Tanya DeRivi
Senior Director, California Climate and Fuels

²⁹ See updated "New ZEV Sales in California" dashboard by California Energy Commission, last updated May 1, 2024, at: <https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics/new-zev-sales>



Tanya M. DeRivi

Senior Director, California Climate and Fuels

February 20, 2024

Ms. Rajinder Sahota
Deputy Executive Officer – Climate Change and Research
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Uploaded at:
https://www.arb.ca.gov/lispub/com/m/iframe_bcsbform.php?listname=lcfs2024

Re: WSPA Comments on Proposed 2024 Low Carbon Fuel Standard Amendments

Dear Ms. Sahota,

The Western States Petroleum Association (WSPA) appreciates the opportunity to comment on the California Air Resources Board's (CARB) proposed amendments and related 45-day rulemaking documents for the Low Carbon Fuel Standard (LCFS) program. WSPA is a non-profit trade association that represents companies that import and export, produce, refine, transport and market petroleum, petroleum products, natural gas and other energy supplies in California and four other western states, and has been an active participant in air quality planning issues for over 30 years.

WSPA has engaged with CARB throughout the LCFS rulemaking process, and previously submitted comments in response to CARB's 2022 and 2023 LCFS workshops. Those comments are incorporated into this letter by reference and are also attached.^{1,2,3,4,5,6}

GENERAL COMMENTS

Fiscal Impact of Proposed Amendments

CARB's proposed amendments are projected to significantly increase the cost of California gasoline, despite ongoing and serious supply constraints related to transportation fuels in California. CARB's Standardized Regulatory Impact Analysis (SRIA) estimates that the proposed amendments to the LCFS program will potentially increase the price of gasoline by an average of \$0.37 per gallon between 2024 and 2030, and further increase the price of gasoline by \$1.15 per gallon between 2031 and 2046.⁷ While CARB's Initial Statement of Reasons (ISOR) describes its cost estimates as "conservative,"⁸ CARB's analysis underestimates revenue impacts to the State's gas tax revenues. CARB estimates that tax revenues will decrease by \$29.2 million⁹ due to "increase[s] in volume of renewable gasoline, ethanol, and renewable diesel fuel sold in the State,"¹⁰ but this estimate does not capture the significant revenue impacts associated with a 90% reduction in gasoline demand,

¹ Western States Petroleum Association. "WSPA Comments on CARB Workshop to Discuss Potential Changes to the LCFS," August 8, 2022.

² Western States Petroleum Association. "WSPA Comments on the August 18th CARB Workshop to Discuss Potential Changes to the LCFS," September 19, 2022.

³ Western States Petroleum Association. "WSPA Comments on the November 9th CARB Workshop regarding Potential Changes to LCFS," December 21, 2022.

⁴ Western States Petroleum Association, "WSPA Comments on CARB Preliminary Discussion Draft of Potential Low Carbon Fuel Standard Regulation Amendments and February 22, 2023 LCFS Workshop," March 15, 2023.

⁵ Western States Petroleum Association, "WSPA Comments on CARB's Proposed Low Carbon Fuel Standard Auto-Acceleration Mechanism and May 23, 2023 Workshop," June 6, 2023.

⁶ Western States Petroleum Association, "WSPA Comments on the Low Carbon Fuel Standard Modeling Updates Workshop," September 12, 2023.

⁷ See SRIA at 58, <https://dof.ca.gov/wp-content/uploads/sites/352/2023/09/LCFS-SRIA-to-DOF-ADA-Compliant.pdf>.

⁸ CARB LCFS ISOR at page 83 <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/isor.pdf>

⁹ <https://oal.ca.gov/wp-content/uploads/sites/166/2024/01/2024-Notice-Register-No.-1-Z-January-5-2024.pdf>

¹⁰ CARB, Low Carbon Fuel Standard 2023 Amendments, Standardized Regulatory Impact Assessment, September 8, 2023, at <https://dof.ca.gov/wp-content/uploads/sites/352/2023/09/LCFS-SRIA-to-DOF-ADA-Compliant.pdf>

which is the forecasted impact of the proposed amendments. The gas tax provides substantial funding for California's infrastructure projects, which will be needed to meet California's electrification goals and address associated increases in electricity demand. CARB has also adopted several rules designed to reduce gasoline demand (e.g., Advanced Clean Cars II, Advanced Clean Trucks, Advanced Clean Fleets), but has neither assessed the full impacts of this change nor has it addressed how to replace this funding, which leaves the State in a vulnerable position.

These significant cost increases conflict with ongoing efforts by the California legislature to ease cost burdens associated with California fuels. Senate Bill (SB) X1-2 (2023) directs State agencies to evaluate measures to ensure that petroleum and alternative transportation fuels are adequate, affordable, reliable, and equitable. The California Energy Commission (CEC) estimates that the LCFS Regulation already adds 11 cents per gallon to the cost of California gasoline.¹¹ The impacts of these price increases are significant for California consumers – California continues to face serious supply constraints for transportation fuels, leading energy affordability to be a pressing priority for many Californians. The legislature recognized the importance of these impacts in enacting SB X1-2. CARB must therefore ensure that its revised LCFS program does not further compromise the supply reliability of critical transportation fuels, a consequence of which could increase energy costs and further burden California drivers, conflicting with clear legislative priorities in SB X1-2.

CARB's proposed LCFS Amendments may exacerbate these cost issues by constraining the credit generation for fuels, such as crop-based biofuels and hydrogen, while simultaneously and significantly increasing and potentially accelerating program stringency. Credit prices are also approaching a maximum – CARB estimates that credit prices will reach the program ceiling in 2025 and 2026. As CARB emphasized in 2020, prices beyond this point would create "potential adverse impacts to California consumers."¹² CARB's proposed program amendments would add new limits to credit generating opportunities just as LCFS credit prices approach the price ceiling, exacerbating cost impacts. These combined measures undermine the program's cost-effectiveness, in violation of Health and Safety Code (HSC) § 38560, which requires CARB to ensure that its program amendments are cost-effective. Similarly, HSC § 43018 requires CARB to adopt only necessary, cost-effective, and technologically feasible regulations. California Government Code § 11346.2(b)(4) also requires CARB to consider "reasonable alternatives to the regulation that would lessen any adverse impact on small business," and reasonable alternatives that are "less burdensome." As part of these alternatives, CARB must consider "overall societal benefits, including reductions in other air pollutants, *diversification of energy sources*, and other benefits to the economy, environment, and public health."¹³ To comply with these provisions, WSPA urges CARB to revise its proposed program amendments to create a more cost-effective, less burdensome regulatory program that protects a diverse energy portfolio.

As part of preserving a diverse energy portfolio, CARB must ensure that the proposed amendments do not burden ethanol development. As drafted, proposed § 95488.9(g)(1)(A) states: "*All feedstocks at the point-of-origin must be certified by January 1, 2028. Fuel quantities reported under fuel pathways utilizing feedstocks not certified by January 1, 2028, must be assigned the ULSD carbon intensity [(CI)] found in Table 7-1 of the LCFS regulation.*" This requirement is overly broad and may require ethanol feedstocks to meet certification and tracking requirements, which would significantly increase the cost and burden of ethanol and disincentivize ethanol development. This would conflict with HSC § 38560's mandate that CARB adopt measures "to achieve the maximum technologically

¹¹ Based on CEC SB X1-2 data at <https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/california-oil-refinery-cost-disclosure>

¹² 2020 CARB ISOR pII-2. <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2019/lcfs2019/isor.pdf>

¹³ HSC § 38562.

feasible and cost-effective greenhouse gas emission reductions from sources.” Ethanol is critical for achieving lower-CI for gasoline with limited to no substitutes for ethanol to achieve today’s CI reductions. CARB should therefore clarify that these requirements do not apply to ethanol, and account for costs related to ethanol production and importation in assessing the program amendments.

Additionally, CARB should ensure that the program amendments preserve a *technology-neutral* approach in order to maximize cost-effectiveness. CARB’s proposal to phase out avoided methane crediting and project-based crediting treats different low-CI technologies inconsistently, disincentivizing certain investments and foregoing important emissions benefits. For example, in Book-and-Claim accounting, low-CI process energy would need a direct connection, while low-CI electricity and hydrogen used in transportation would not require this additional step. Removing existing crediting mechanisms risks stranding assets while discouraging investments in other zero-emission and low-emission technologies, which will lead to increased program costs and will decrease emissions benefits associated with methane reductions. This approach also runs counter to existing programs incentivizing the development of projects to address Short-Lived Climate Pollutants. We encourage CARB to instead study the potential impacts of imposing deliverability requirements before adding untested regulatory restrictions.

The LCFS program centers around a market-based approach to emissions reductions from all transportation fuels. Preserving flexibility in how credits are spent enhances the trading program and protects investments made by private companies to help make the program both successful and replicable. By contrast, imposing spending requirements, like those on electric vehicles, impedes private sector investment in alternative fuel technologies and infrastructure, such as hydrogen refueling and alternative uses for biomethane, which are essential for achieving California’s greenhouse gas (GHG) reduction goals.^{14,15}

Unsubstantiated Need for Crop-based Feedstock “Guardrails”

WSPA supports CARB’s decision not to include arbitrary caps on crop-based feedstocks or fuels. As WSPA noted in prior comment letters, these caps would limit proven GHG reductions strategies that are delivering significant GHG reductions today. Any concept of a cap on a specific fuel type conflicts with Health and Safety Code § 38560’s mandate that CARB adopt measures “to achieve the maximum technologically feasible and cost-effective greenhouse gas emission reductions from sources.”¹⁶ For the same reasons, any such cap would also likely run afoul of Health and Safety Code § 38562’s requirement to consider “diversification of energy sources, and other benefits to the economy, environment, and public.” Staff has also confirmed that CARB “received limited data, analysis and supporting documents” and that there was no majority of stakeholders presenting a compelling argument in favor of such a significant programmatic change.

While CARB has declined to include a “cap” on crop-based feedstocks, CARB is now proposing to impose “sustainability guard rails” that may limit the supply of crop-based feedstocks used in the production of biofuels. As part of these guardrails, the feedstock supply chain would be required to comply with a resource-intensive, duplicative third-party process to ensure that crop-based and forestry-based feedstocks are not sourced on land that was forested after January 1, 2008. This process would increase costs associated with biofuel production. CARB explains that these guardrails are intended to “reduce the risk that rapid expansion of biofuel production and biofuel feedstock demand could result in deforestation or adverse land use change.”¹⁷ However, CARB has

¹⁴ California Transportation Commission’s Clean Freight Corridor Efficiency Assessment (SB 671), November 22, 2023, at <https://ctc.ca.gov/-/media/ctc-media/documents/ctc-meetings/2023/2023-12/14-4-4.pdf>

¹⁵ Joint Agency Staff Report on Assembly Bill 8: 2023 Annual Assessment of the Hydrogen Refueling Network in California, December 22, 2023 at <https://www.energy.ca.gov/publications/2023/joint-agency-staff-report-assembly-bill-8-2023-annual-assessment-hydrogen>

¹⁶ See also HSC § 43018.

¹⁷ ISOR at 32.

not provided data demonstrating that there is a sustainability issue that needs to be addressed. The details of this concept were introduced late in the rulemaking process based on general concerns raised by commenters, and CARB has not received sufficient public input from key stakeholders – including California’s transportation fuel producers who rely on crop-based feedstocks to support the delivery of alternative transportation fuels for Californians.

Existing LCFS program measures and related federal programs provide sufficient guardrails to address potential land use changes associated with crop-based feedstocks. The LCFS program “uses land use change emissions estimates...[to] make fuel pathways from crop-based feedstocks more carbon intensive,” thereby discouraging the use of crop-based fuels and incentivizing “waste-and-residue-based” feedstocks.¹⁸ In addition, the federal Renewable Fuel Standard (RFS) program¹⁹ imposes mapping and tracking requirements for foreign sourced crops, as well as specific forest-based feedstock requirements. This program mandates that crop-based feedstocks be sourced from existing agricultural land cleared or cultivated prior to December 19, 2007. For feedstocks grown outside of the United States or Canada, entities must map and track the point of origin to ensure that this restriction is met.²⁰ For feedstock grown in the United States or Canada, EPA verifies compliance when it issues a Renewable Volume Obligation.²¹ Regulated entities are also prevented from obtaining federal Renewable Identification Number (RIN) compliance credits for converting land not already in use as of 2007.²² Further, all feedstock used to produce compliance renewable fuels must meet the definition of “renewable biomass.” Given these existing requirements, CARB’s proposed tracking and certification requirements would be duplicative.

The additional measures proposed by CARB will create an unnecessary burden for transportation fuel producers and may impact the availability of alternative transportation fuels. Requiring farmers to obtain third-party certification may increase feedstock prices, impacting biofuel production costs and increasing overall fuel prices in California. Requiring farmers to provide documentation that dates to January 1, 2008, would likely also impose an undue burden. This information will be 20 years old by the time these program revisions go into effect. By comparison, Canada’s Clean Fuel Regulation only requires documentation to July 1, 2020.

Moreover, as written, if a feedstock supplier for ethanol production cannot obtain the required certification and that ethanol is transported into California, the default CI score of that ethanol is that of ultra-low sulfur diesel (ULSD). This would penalize the ethanol supplier by increasing the CI 6.61 points from the gasoline value, which would otherwise be the appropriate CI score for fuel ethanol acting as a gasoline substitute. Suppliers would therefore be disincentivized from transporting ethanol into California, and ethanol supply may decrease. Inclusion of ethanol into this provision may significantly limit ethanol supply and, thus, gasoline supply (as diesel does not have this requirement), because there are limited oxygenates on the market that meet CARB’s requirements. Therefore, lowering ethanol supply by imposing burdensome new requirements may also constrain the supply of gasoline substitutes and may significantly limit gasoline supply.

If CARB retains these “guardrail” provisions, WSPA recommends the following revisions:

- **Definitions and Scope.** The proposed regulation fails to include important definitions – as identified later in the technical section of this letter – that will be necessary for implementation. CARB should clearly define the feedstocks covered by the feedstock sustainability criteria to ensure that certification requirements are narrowly tailored to address soybean oil and canola-based biodiesel and renewable diesel. The proposed amendments do not define crop- and

¹⁸ CARB, Low Carbon Fuel Standard 2023 Amendments, Initial Statement of Reasons, December 19, 2023, at 32.

¹⁹ See RFS Section 80.1454(c) and (g).

²⁰ See 80.1454(c).

²¹ See 80.1454(g).

²² Energy Independence and Security Act, Public Law 110-140 enacted December 19, 2007.

forest-based feedstocks. Without a definition, CARB's proposed tracking and certification requirements may apply to ethanol, which would likely impose significant burdens on alternative fuels that are critically important for achieving California's stringent gasoline formulation requirements.

- **Certification Process.** CARB should clarify procedures for entities to submit certifications under the proposed requirements. Section 95488.9(g) focuses on requirements for entities seeking to become approved certification systems, but gives little direction to entities complying with the sustainability standards. WSPA requests clarification on the following issues:
 - How and when will certifications be submitted?
 - Which party is responsible for submitting the certification – the feedstock supplier, the fuel pathway holder, or the fuel reporting entity?
 - Can this obligation transfer? The proposed regulation states that fuel quantities reported under fuel pathways utilizing feedstocks not certified by the deadline will be assigned the ULSD CI. However, this does not account for co-processed feedstocks, some of which may have certification and others that do not.
- **Certification System Approval.** CARB should define clearer criteria for certification scheme approval. Proposed § 95488.9(g)(1)(B)(2) states that the certification system “must consider environmental, social, and economic criteria.” However, these criteria are overly vague and leaves too much discretion to the Executive Officer. Instead, CARB should ensure that the approval process includes a mechanism for incorporating input from the public and the regulated industry. This public review process would be more consistent with existing LCFS procedures for pathway applications.

WSPA believes that creating a new crop-based biofuel certification regime by 2028 will be daunting, unjustified, and will only further add to the administrative burden for CARB staff and regulated entities. The proposed LCFS Amendments should provide sufficient time to implement any substantive provisions that directly impact the production and certification of lower CI technologies – including sustainability certifications for crop-based biofuels – as obligated parties must be able to plan accordingly for technology investments and deployment. As such, CARB should defer adding these requirements until a future rulemaking when they can be more thoroughly vetted with stakeholders and address incorporating “climate smart” agricultural practices. If CARB decides to include these certification regimes, WSPA urges CARB to align requirements with programs in other jurisdictions, such as Canada's Clean Fuel Regulation, to ensure consistency and to preserve market stability.

Concerns Regarding Proposed Specified Source Feedstock Attestation Requirements

CARB's proposed attestation requirement is unnecessary. The specified source feedstock attestation requirements would unduly burden fuel producers with no significant benefit as existing regulatory provisions already require review and verification related to the chain of custody. Fuel pathway holders must submit to third party verification evidence of chain of custody for specified source feedstocks as well as provide a RFS separated food waste plan. Imposing additional attestation requirements on top of these existing provisions would significantly add to process workloads.

If these provisions are retained, WSPA requests that CARB clarify procedural obligations associated with attestations. *First*, CARB must clearly specify which default emission factors supply chain entities are required to attest against. It is not possible to attest that a step within the supply chain does not meet a pathway CI unless the default emission factors CARB requires pathway holders to utilize are clearly understood by each entity within the supply chain. For example, using the terms “additional processing” is a broad category that fuel producers may interpret differently than CARB. WSPA does not view water removal and basic filtration at the point of collection as additional

processing. But separating out solids, removing soluble impurities, drying the feedstock and filtration using bleaching clay, diatomaceous earth and/or other filter agents may be considered additional processing.

Second, without some limiting factor, every entity within a supply chain could be pulled into attestation requirements. For example, for a used cooking oil supply chain, current provisions could be read to require that each individual restaurant maintain attestations, all the way back to the first collection point. WSPA recommends that CARB specify that attestation requirements begin at the physical feedstock aggregator where feedstocks are collected before any processing occurs upstream of the fuel producer to limit burdens associated with this requirement. This approach would be consistent with the limited attestation language provided in § 95488.8(g)(1)(D)(3), which contains information that only later entities in the supply chain would be able to attest to (specifically, that “the specified source feedstock has not undergone additional processing, such as drying or clean-up except as explicitly included in the pathway life cycle analysis and pathway CI”).

Third, CARB should clarify that attestations will not be required to be passed down the supply chain from entity to entity, and that fuel pathway holders will not be liable for failure of supply chain entities to meet the attestation letter requirement. Such a requirement is unnecessary given the existing feedstock supplier auditing requirements, which ensure that both third-party verifiers and CARB have sufficient information to verify compliance. To address these procedural issues, WSPA recommends that CARB provide guidance documents, including examples, for regulated entities, supported by clear regulatory language. CARB already has third-party requirements on specified source feedstocks; however, as indicated above, the verification (or attestation) requirement belongs with the feedstock producer, not with the renewable fuel producer that purchases the feedstock.

Reporting Requirements for Newly Obligated Intrastate Fossil Jet Fuel

The proposed LCFS Amendments would eliminate the existing exemption for intrastate fossil jet fuel and make fuel importers and producers the First Fuel Reporting Entity beginning in 2028. WSPA strongly urges CARB to retain the exemption, or make aircraft operators (which include passenger airlines, aircraft cargo companies, and small aircraft owners) the First Fuel Reporting Entity instead, consistent with CARB’s earlier proposal in considering program updates.

Fuel importers and producers lack sufficient information to meet these additional reporting requirements. Under the newly proposed reporting requirements, these entities would be required to report information on how fossil jet fuel is *used*, based on whether aircraft operators use fossil jet fuel only for intrastate flights (defined as flights that take off and land in California). Under other existing regulatory provisions, fuel importers and producers generate deficits at the time of importation or production – but CARB would now be imposing the point of deficit generation at end-use, past even the point of sale. It seems unlikely that a fuel importer or producer could manage this obligation. Airport storage facilities are typically jointly owned by the airlines, and the fuel in these storage facilities is not segregated out by airline. After delivery of the fuel into an airport storage facility, fuel importers and producers have no visibility into how individual airlines use the jet fuel. Requiring fuel importers and producers to report on usage would be extremely challenging, if not impossible.

Aircraft operators are far better positioned to report on fuel usage, and can better ensure that the reported information is accurate. Operators possess relevant information to support reporting, including:

- How each individual operators use the fuel supplied to the airport storage facility;
- Which plane the fuel is uploaded into; and

- The flight path of each plane (including those scheduled to take off and land within the State of California).

Some of this information may be considered confidential business information, which WSPA believes should not be shared with fuel producers and importers. The proposed amendments do not specify what information airlines must provide to fuel producers and importers or how information-sharing would work. Without access to this information, fuel suppliers cannot verify end use and cannot meet the proposed reporting obligations.

This information/reporting mismatch creates substantial challenges that extend well beyond logistical concerns:

- **Overreporting.** To account for lack of information on flight paths, fuel importers and producers may need to assume that any fuel delivered to an airport storage facility will be used in-State unless an aircraft operator explicitly states otherwise. Reporting would therefore unwittingly include interstate and international jet fuel, which the program is not intended to regulate. Further, it is unclear if the existing compliance reporting reconciliation timeline fits within any existing data collection process an aircraft operator utilizes to ensure deficits are not accrued for non-obligated uses.
- **Increased Prices.** Without information on the intended use of the fuel at the time a transaction takes place, *all* fossil jet fuel may carry an obligation which may increase the price of jet fuels within the State.

The ripple effect of adding the intrastate jet fuel obligation may include aircraft operators re-optimizing flights to flight paths to include additional fueling outside of California, reducing intrastate jet fuel consumption; this would contribute to emissions leakage. Under Assembly Bill (AB) 32 (2006), CARB has an obligation to minimize leakage resulting from its regulatory activities.

As described above, fuel importers and producers have no ability to differentiate between intrastate, interstate, and international fuel usage in meeting proposed reporting obligations.²³ CARB also has not proposed a definition for intrastate jet fuel consumption, including an appropriate method for calculating the quantity of jet fuel consumed. Airlines have varying approaches to fueling operations, including visiting multiple stops between fueling (e.g., out-of-State, visiting multiple California airports without refueling). As written, CARB's proposal will sweep in a broad range of fueling operations outside intrastate jet fuel consumption and impose significant reporting burdens on entities that have minimal connections to California. CARB's proposal may therefore impermissibly burden *interstate* commerce in violation of the Dormant Commerce Clause doctrine. States cannot place burdens on interstate commerce that are "clearly excessive in relation to the putative local benefits."²⁴ By regulating aviation fuels, CARB's proposal impacts the instrumentalities of interstate transportation and impedes the flow of interstate commerce.

In sum, WSPA believes that the addition of intrastate fossil jet fuel deficits creates unique challenges and may not address the goal of encouraging alternative jet fuel use. If CARB proceeds with this addition, WSPA strongly encourages CARB to reconsider this proposed amendment and return to the proper reporting parties that *do* possess the knowledge required to accurately comply: the aircraft operators. CARB must also incorporate better definitions and clear compliance methodology, including the following:

²³ Interestingly, there is no consideration that some fossil jet fuel imported or produced in California may also be used in military applications. There is no evaluation of whether this is a legally permissible scope for LCFS or whether fuel producers and importers could reasonably expect to be provided with information about the end use of such fuel, given the classified nature of such information.

²⁴ *Pike v. Bruce Church, Inc.*, 397 U.S. 137, 142 (1970).

- The First Fuel Reporting Entity for intrastate fossil jet fuel use would be the aircraft operators (or Fixed Base Operator for general aviation use).
- A simplified reporting approach that does not rely on aircraft operators to track and report actual consumption. CARB should work with aircraft operators to determine a mileage-based multiplier or similar methodology.
- Clear verification parameters specific to intrastate jet fuel reporting.

LCFS Program Stringency

CARB is proposing several updates to increase the LCFS program stringency. *First*, the amendments would set more stringent CI reduction targets, increasing the 2025 CI target by 5%, increasing the 2030 CI reduction target from 20% to 30%, and adding a 2045 CI target of 90%. *Second*, the proposed amendments would add a triggering mechanism – the Automatic Acceleration Mechanism (AAM) – which would advance the CI standard in a given year to a future year if specified market conditions are met, in order to bridge periods of credit surplus and maintain a steadier program signal.

The proposed amendments increase program stringency while removing certain compliance tools and key flexibilities for fuel producers that mitigate program costs. Based on this confluence of factors, without certain protections in place, the AAM may compromise necessary market signals that incentivize the production of lower-CI fuels while preserving consumer choice and providing a level playing field for all technologies. To better understand potential market impacts, WSPA requests that CARB release information on how often the AAM could be triggered, using the modeling scenarios CARB developed with the CATS Model. In addition, we recommend that CARB incorporate a robust yearly review as a standard program feature to evaluate the impacts of these structural changes, including the annual status of the credit bank, and the effects on California energy prices. Energy pricing data is readily available, since LCFS-associated costs embedded into all wholesale gasoline sales are required to be reported on a monthly basis pursuant to SB 1322 and SB X1-2.²⁵ CARB should also incorporate a robust consultation process with relevant stakeholders (such as fuel providers and distributors) to better understand potential issues and consider possible unintended consequences during this annual review and before triggering the AAM.

In order to address any credits-to-deficit imbalance resulting from overly aggressive CI benchmarks or the AAM, CARB should also incorporate a reset mechanism. This mechanism would strengthen the credit trading market by providing greater regulatory certainty and strike an appropriate balance between achieving meaningful reductions offering sufficient business, technology, and financial support to industry, which would ensure these accelerated targets are durable and achievable. Such a mechanism should be available in several circumstances tied to market activity signals and statutory factors, including: a recession or an accelerated growth period in California, a significant unforeseen event (e.g., a global pandemic), and growing affordability and supply reliability issues. Incorporating a reset mechanism would better effectuate SB X1-2's directive for State agencies to evaluate measures to ensure that petroleum and alternative transportation fuels are adequate, affordable, reliable, and equitable, and would better fulfill CARB's duty under HSC § 38560 to ensure that its regulations are cost-effective. Consistent with SB X1-2, CARB must consider impacts to gasoline costs resulting from its regulations, including the LCFS program and other programs such as the Cap-and-Trade program. As the SRIA indicates that LCFS pass-through costs on gasoline will be well over \$1.00 per gallon beginning in 2037,²⁶ CARB must mitigate additional costs in adopting LCFS program updates.

²⁵ Senate Bill 1322 (2022) and Senate Bill X1-2 (2023); data posted at: <https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/california-oil-refinery-cost-disclosure>

²⁶ CARB LCFS 2023 Amendments SRIA, September 8, 2023, Table 22 at <https://dof.ca.gov/wp-content/uploads/sites/352/2023/09/LCFS-SRIA-to-DOF-ADA-Compliant.pdf>

Program Streamlining Recommendations

WSPA appreciates CARB's ongoing efforts to streamline program implementation by updating existing Tier 1 calculators and creating a new Tier 1 calculator for hydrogen. WSPA encourages CARB to build on these efforts and address additional inefficiencies associated with the current pathway application review and approval process (for registration and renewals). The current system includes duplicative steps that increase workloads for both CARB staff and pathway applicants. To address these redundancies, CARB should work directly with regulated entities, who have significant experience navigating the application process and can readily identify improvement opportunities.

There are currently informal policies and processes in place that would benefit from formal direction via regulation. For example, for both Tier 1 and Tier 2 fuel pathway applications, CARB should streamline the fuel pathway application process when an applicant submits a fuel pathway that adds a new feedstock for an existing renewable fuel facility. In such case, CARB should allow the submission under the same fuel pathway application number as the original fuel pathway application, possibly with the original application number with a revision number (e.g., B0123-02). The review process by both CARB and the third-party should also be expedited and focus on the new feedstock. No site visit by the third-party verifier should be required. The Annual Fuel Pathway Report (AFPR) process would also be simplified by submitting a single AFPR for a renewable fuel facility that processes multiple feedstocks, rather than submitting a duplicated AFPR as is currently required.

WSPA urges CARB to adopt the following administrative improvements to streamline the program:

- **Pathway Holder Deficit Obligation.** CARB should lessen deficit obligations for pathway holders that exceed their CI in a 24-month period. Under the proposed amendments, pathway holders would incur a deficit four times the amount of the annual excess CI generated, *and* have excess credits invalidated, which effectively creates a penalty of five times the amount of the annual excess CI generated. This penalty is disproportionate to the severity of the violation and will likely have an outsized impact on pathway holders, particularly since any true up benefit in a CI is provided to the *importer*, not the pathway holder. Both the benefit *and the obligation* should be with the same party. CARB should lessen the severity of this obligation and either (1) impose the deficit on the importer, or (2) provide true up benefits to the pathway holder as well. Imposing deficit obligations on pathway holders who do not produce fuel in the State, import fuel into the State, or sell fuel into the State, may also unduly burden interstate commerce in violation of the Commerce Clause, by requiring out-of-State pathway holders to suddenly participate in the credit/deficit market, which creates significant new obligations compared to being a pathway holder participant. WSPA also requests clarity on when fuel pathway holders would need to register in the LCFS Reporting Tool and Credit Bank & Transfer System (LRT/CBTS) and when they would become subject to the reporting requirements in § 95491.
- **Expiring Fuel Pathways.** Consistent with WSPA's prior comment letters, WSPA urges CARB to keep pathway codes active for two quarters after their expiration date. Under the current LCFS Regulation, regulated entities can sell volumes up to two quarters after purchasing them. CARB should keep these pathway codes active for two quarters after their expiration date, to allow for follow-on downstream activity to be reported. Any new production would not be allowed to be reported during those two quarters. This would eliminate a substantial amount of ongoing rework when downstream parties report a legitimate resale of a pathway purchased, only to find later that CARB has deactivated it.
- **Accelerate Approvals Where Feasible.** CARB should accelerate temporary pathway approvals or provisional pathway approvals by creating a 30-day deadline to review a temporary fuel pathway request application and provide initial feedback. CARB is proposing to change the "deemed complete date" for Tier 2 applications; however, this date does little to streamline the

pathway application process or resolve the issues with fuel pathway processing, given that application reviews and validations are taking several months to complete. This means that credit generation is delayed while these reviews are ongoing. Ultimately, availability of the certified pathway often occurs multiple quarters, if not years, after the deemed complete date. Rather than merely deeming an application complete, the application should be automatically deemed complete *and approved* if CARB staff has not reviewed the application within 30 calendar days. CARB should also consider automatically extending temporary pathways for pathway applicants who have a Tier 1 or Tier 2 pathway application pending. Finally, WSPA notes that it is critically important that CARB ensure there are adequate resources to support the development and implementation of an efficient fuel pathway review process.

- **Credit True Ups.** CARB should revise the proposed regulatory language to specify that CARB “shall” perform a credit true up for a fuel pathway. As drafted, the current language states only that CARB “may” perform a credit true up for a fuel pathway, which creates uncertainty. WSPA also urges CARB to include credit true ups back to a facility’s startup date and the approval of both temporary and provisional pathways from startup of renewable fuel production.²⁷
- **Verifications.** WSPA encourages CARB to extend the proposed provisions allowing for “less intensive” verifications for entities that receive a positive verification result to other fuel suppliers and projects in order to reduce administrative burdens. In addition, WSPA urges CARB to limit site visit requirements for third-party verification. CARB should allow third-party verification site visits to be done remotely. Video conferencing and screen sharing are well-established technologies and should be sufficient for other types of verification, especially the verification of LCFS quarterly reports. CARB should also limit site visit requirements to an initial LCFS fuel pathway validation, and once every three years thereafter for LCFS fuel pathway verification. Lastly, CARB should work to incorporate a thorough evaluation process for new or converted facilities, followed by a more streamlined process for such sites for future reviews as part of one application process.
- **Incremental Deficits.** CARB should streamline crude CI determinations by eliminating the annual update requirement. Under the current program, CARB updates the Oil Production Greenhouse Gas Emission Estimator (OPGEE) Model and determines the average crude CI on an annual basis, which requires reporting entities to expend significant time and resources generating MCON reports and having the MCON reports verified by third parties. Compared to this significant effort, annual adjustments to the CARBOB and ULSD CI score have been very minor. Instead, reducing benchmarks has a comparatively outsized impact on deficit generation. WSPA recommends that CARB address any significant impacts on the crude CI to CARBOB and ULSD during the LCFS rulemaking process instead of requiring annual updates.
- **MCON (Crude) Reporting.** CARB should eliminate the requirement for refineries to report California crudes by field name in the MCON report. This reporting requirement is unnecessary, because CARB is using data from the California Department of Conservation instead. CARB should also eliminate verification requirements for California crudes.
- **Information Technology (IT) Updates.** WSPA recommends including an IT portal system that allows many separate entities to input their own CI data to generate a “create your own pathway score” tool. For example, if an entity wants to process feedstock through crushers and refiners (that are already in the system), the entity would be able to just allocate volumes across a refinery/crusher using the database.

²⁷ See Section 95488.10(a)(1).

- **Enhanced Communication.** CARB should provide regular status updates on temporary pathway applications that can be shared with counterparties. CARB should post a list of approved temporary pathways by company and by date of applicability.
- **Reporting Deadlines.** CARB should change the third quarter reporting deadline from December 31st to January 15th, to allow flexibility over the winter holidays.
- **Crediting for Corrected Reporting Errors.** CARB should allow credits to be generated for reporting errors that have been corrected. Corrections for commercial transactions and accounting adjustments are a routine part of business and regulated parties should not be penalized for improving the accuracy of reporting under the LCFS program.
- **Abnormalities.** WSPA recommends that CARB provide guidelines to account for transient operations and abnormal conditions given the 24-month data requirement.
- **Implementation of GREET 4.0.** To maintain consistency in the program and minimize disruption, current pathways should remain open during the transition from GREET 3.0 to GREET 4.0. Please see further comments below regarding specific GREET 4.0-related issues and concerns.

Limiting Hydrogen Unnecessarily Constrains Investment and Deployment Opportunities

Incentivizing growth and investment in the hydrogen sector is critical for California's efforts to reduce GHG emissions while also providing affordable, reliable, and cleaner energy for all Californians. According to CARB's 2022 Scoping Plan Update²⁸ the State will need to add approximately 1,700 times the amount of the current hydrogen supply by 2045. Scaling up hydrogen production for California's energy systems requires development of a broad range of technologies, including steam methane reforming (SMR), autothermal reforming (ATR), and electrolysis using renewable electricity, as well as biogas, biomethane, and thermochemical conversion of biomass and waste feedstocks.²⁹

Yet CARB's proposed program updates would inhibit hydrogen development by imposing new constraints on hydrogen eligibility within the LCFS program. Specifically, CARB should not propose to limit end-uses of program-incentivized hydrogen based on a "color" system, limit Book-and-Claim accounting for hydrogen, and impose a new 50% capacity cap. CARB should reconsider these proposals.

- **Hydrogen End-Uses.** Limiting end-uses of program-incentivized hydrogen will inhibit the development of additional hydrogen production. Instead, the LCFS program should continue to preserve consumer choice and provide a level playing field for all technologies, embracing fuel- and technology-neutral principles that focus on the meaningful and timely reduction of GHG emissions. WSPA urges CARB to adopt a technology-neutral approach that uses a CI score as the main driver to reduce emissions, rather than a "color" system that constrains uses. The color system creates regulatory uncertainty by facilitating subjective, changing definitions and interpretations of permissible uses, which stifles long-term investment and innovation.

CARB assumes that limiting end-uses of hydrogen will funnel new capital investments to certain preferred hydrogen technologies such as electrolysis using renewables, a technology that is, by most estimates,³⁰ at least triple the cost of hydrogen currently produced by SMR.

²⁸ 2022 Scoping Plan Update <https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents>

²⁹ See CEC, "Roadmap for the Deployment and Buildout of Renewable Hydrogen Production Plants in California," June 2020. <https://www.energy.ca.gov/publications/2020/roadmap-deployment-and-buildout-renewable-hydrogen-production-plants-california>

³⁰ Justin Bracci, Adam Brandt, Sally M. Benson, Gireesh Shrimali and Sarah D. Saltzer, "Pathways to Carbon Neutrality in California: The

However, rapid growth across a broad range of hydrogen technologies must be incentivized to successfully scale up hydrogen production. Large-scale innovation and new investment in various industrial sectors relies on a diverse portfolio of resources. Arbitrarily restricting end-uses will stifle investments and innovation, and conflict with federal funding incentives.

By constraining end uses, CARB is failing to achieve the “maximum technologically feasible and cost-effective greenhouse gas emission reductions” in accordance with Health and Safety Code § 38560. A technology-neutral approach would better align with CARB’s rulemaking obligations under Government Code § 11346.2(b)(4)(A), which requires CARB to consider performance standards as an alternative to mandating the use of specific technologies or equipment, or prescribing specific actions or procedures.

- **Book-and-Claim Accounting.** The proposed regulatory updates would unnecessarily limit Book-and-Claim Accounting for hydrogen, which would likely constrain growth in hydrogen production and deployment. This conflicts with emission reduction measures in the 2022 Scoping Plan Update, which requires significant expansion of hydrogen production. As noted in WSPA’s prior comment letters, the goal of the LCFS program is to incentivize the production of low carbon intensity fuels and energy sources for transportation, rather than fuel/energy dispensing infrastructure. All hydrogen production pathways should be considered based on their CI reduction potential. CI benchmarks should be used as the singular determining factor to drive CI reductions and credit values.
- **Capacity Cap.** CARB is proposing a new 50% capacity cap to incentivize more market participation without inflating the overall credit supply. However, this approach may instead nullify investor incentives and constrain future hydrogen development. A capacity cap is unnecessary – the LCFS program already includes a 2.5% limit on credits, and this segment has not yet come close to reaching the limit.
- **Tax Credits.** CARB is proposing to model LCFS program updates on pending federal updates to tax credits under Internal Revenue Code Sections 45V and 48(a)(15). Imposing well-to-wheel CI limits of ≤55 grams per megajoule (gCO₂e/MJ) for gaseous hydrogen and ≤95 gCO₂e/MJ for liquid hydrogen for pipeline transfers to “align” with the US Treasury/IRS proposed rule on Section 45V “Clean Hydrogen Production Tax Credit” of the Inflation Reduction Act, is unnecessary and confusing. The Treasury/Internal Revenue Service (IRS) proposal was published on December 26, 2023, and will likely be finalized well after CARB finalizes these LCFS amendments. These regulations may significantly change before they become final. However, if CARB seeks to align these programs, then it should, at minimum, retain the IRS’s technology-neutral approach.

SPECIFIC COMMENTS

Section 95481. Definitions and Acronyms

The proposed regulation is missing critical definitions that will make implementation challenging for CARB and regulated entities. This includes a definition for crop- and forest-based feedstocks as well as palm derivatives. For example, CARB is proposing to prohibit transportation fuels produced from palm oil or palm derivatives, based on deforestation concerns identified by the European Commission.³¹ However, without a clear definition of “palm derivatives,” this action may exclude

Hydrogen Opportunity,” Stanford Center for Carbon Storage and Stanford Carbon Removal Initiative. <https://sccs.stanford.edu/california-projects/pathways-carbon-neutrality-california>.

³¹ European Commission, Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the status of production expansion of relevant food and feed crops worldwide. Brussels. March 13, 2019. <https://eur-lex.europa.eu/legalcontent/EN/TXT/?uri=CELEX:52019DC0142> European Commission, Annexes to the Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee

fuels that can contribute to the objectives of the LCFS program, such as fuels derived from palm oil mill effluent (POME) oil, waste oil extracted from spent bleaching earth from palm oil refining (SBEO) or empty palm fruit bunches oil. These fuels are different from palm oil and are not considered high-risk feedstock. The European Union's REDII Annex IX Part A³² considers waste generated by palm oil mills, such as POME oil, SBEO³³ and empty palm fruit bunches oil, as "advanced" raw materials. The European Union has also distinguished between the *types* of palm derivatives, including POME oil, SBEO, empty palm fruit bunches oil, and palm fatty acid distillates (PFAD). PFAD are excluded from the residue definition in European jurisdictions (e.g., Germany, Sweden, Norway), while POME oil and empty palm fruit bunches oil are included in the REDII as waste streams within either energy intensity or GHG reductions. These alternative fuels can significantly reduce GHG emissions – the International Council on Clean Transportation (ICCT) has indicated that renewable diesel derived from POME oil has a net GHG emission reduction of 71%.³⁴ CARB should narrowly define any restrictions for "palm derivatives" to facilitate feedstocks such as POME oil, SBEO and empty palm fruit bunches that can contribute to the stringent carbon intensity reductions contemplated in the proposed rule. CARB should also ensure that the scope of the certification requirements are clearly defined – the proposed amendments do not define "point-of-origin," which creates significant uncertainty on the point of certification requirement.

Other considerations in proposed definitions and acronyms include:

- *"Alternative Jet Fuel" means a drop-in fuel made from ~~petroleum or non-petroleum~~ sources, which can be blended and used with into conventional petroleum jet fuels without the need to modify aircraft engines and existing fuel distribution infrastructure."*
 - This amendment, to eliminate petroleum sources, would eliminate coprocessing and other means to produce Sustainable Aviation Fuel. CARB should remove the proposed strikeouts and restore the original wording.
- *"Break ground" means earthmoving and site preparation necessary for construction of the digester system and supporting infrastructure that starts following approval of all necessary entitlements/permits for the project."*
 - This definition should be expanded to other projects. It should not singularly apply to digester systems.
- *"Byproduct" means a secondary product with marginal economic value outside its use in a biofuel pathway."*
 - WSPA seeks clarification from CARB that a "byproduct" cannot be designated as a co-product.
- *"Clean Fuel Reward" is a statewide program established by EDUs to provide a reduction in price ~~on new light-duty EV~~ purchases or leases for new medium- or heavy-duty electric vehicles that are not subject to the High Priority and Federal Fleets requirements as specified in, title 13, California code of Regulations, section 2015(a)(1) in California. The Clean Fuel Reward is funded exclusively through LCFS proceeds generated by EDUs from electricity fuel."*
 - WSPA requests that CARB confirms that the intent of this definitional change is to no longer generate Clean Fuel Rewards for light duty vehicles.
- *"Conservative" means reducing the estimated GHG reduction benefits of an operation or utilizing methods and factors that over-estimate energy usage or carbon intensity (90th*

of the Regions on the status of production expansion of relevant food and feed crops worldwide. Annexes 1 to 2. Brussels. March 13, 2019. Searle, S., Defining Low and High Indirect Land-Use Change Biofuels in European Union Policy. The International Council on Clean Transportation. November 2018.

³² Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources. Source: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2018.328.01.0082.01.ENG&toc=OJ.L:2018:328:TOC

³³ See Annex 9A under part (g), Commission Implementing Regulation (EU) 2022/996, June 14, 2022, on rules to verify sustainability and greenhouse gas emissions saving criteria and low indirect land-use change-risk criteria.

³⁴ "Potential greenhouse gas savings from a 2030 greenhouse gas reduction target with indirect emissions accounting for the European Union.

percentile or highest value) or under-estimate produced fuel volumes (10th percentile or lowest value).

- WSPA requests that CARB clarify this definition because under-estimating produced fuel volumes of CARBOB or ULSD is *not* a “conservative” estimate.
- *“Organic Waste” is material that meets both the LCFS definitions of “biomass” and “waste.”*
 - WSPA requests that CARB provides some examples of what qualifies for organic waste and what does not.
- *“Renewable Naphtha” means naphtha that is produced from hydrotreated lipids and biocrudes, or from gasified biomass that is converted to liquids using the Fischer-Tropsch process. This includes the renewable portion of a naphtha fuel derived from co-processing biomass with a petroleum feedstock.*
 - CARB should extend the definition of renewable naphtha to any type of renewable feedstocks.

Section 95482. Fuels Subject to Regulation

- In (a)(11) CARB should remove fossil jet fuel. Otherwise, CARB should specify “intrastate” fossil jet fuel.
- In (c)(2) CARB should clarify by stating: Fossil jet fuel. Otherwise, CARB should specify “Fossil jet fuel produced or imported before 2028 or used for interstate or international flights in any year.”
- In (f), CARB should confirm that this section does not apply to fuels such as used cooking oil from palm oil, and therefore used cooking oil from palm oil is eligible for LCFS credits. Please refer to comments above on palm derivatives definitions.

Section 95483. Fuel Reporting Entities – Jet Fuel

- In (a), the reference to “fossil jet” should be removed from this section. In (a)(C), the reference to “fossil jet” should be removed from this section as well.

Section 95484. Annual Compliance Benchmark

- In (b), Auto-acceleration Mechanism, (2) CARB needs to clarify the definition of Credits_{20xx} and Deficits_{20xx}: does Credits_{20xx} represent the cumulative total number of credits generated since 2011 (“the program”) or does it represent the number of credits generated in a single year? Does Deficits_{20xx} represent the cumulative total number of deficits generated since 2011 (“the program”) or does it represent the number of deficits generated in a single year? WSPA requests that CARB explain the basis for the equation under 95484(2)(A). WSPA recommends that CARB conducts a formal annual program review which would consider not only historical data, such as the credit bank and the deficits and credits generated, but also a forecast of the fuel demand and production in the various category of fuels. This information would be used to assess how the benchmark would be set (higher, flat, lower) for the next compliance period(s). This would be more practical than borrowing credits from the future as described in section 95485 (c)(3)(C) (Advanced Credits).
- WSPA requests that CARB justify why the USLD baseline values increase by more than 5 gCO₂e/MJ starting in year 2025 at 105.76 gCO₂e/MJ from 100.45 gCO₂e/MJ in the current regulation.

Section 95485. Demonstrating Compliance

- In subsection (c)(3)(c) Advanced Credits, WSPA appreciates that CARB is proposing to increase the limit of Advanced Credits from 10 to 30 million. However, as described in our other comments regarding benchmarks, it would be more effective if CARB “froze” the benchmarks instead of advancing credits from the future as described in this section.

Section 95486.1. Generating and Calculating Credits and Deficits Using Fuel Pathways

- In Section 95486.1, under deficit obligation for verified CI exceedance, the nature of a facility's operations will result in variation of CI with time, which could result in unintended situations where the certified CI is exceeded. To account for these operational variations, similar to the provision for the incremental deficit calculation associated with crude, CARB should consider only accounting for true ups (deficits or credits) when the difference exceeds a certain threshold.
- In (a)(1), CARB should remove the reference to fossil jet fuel.
- In (g) and (g)(1), Calculation of Deficit Obligation for Verified CI Exceedance, CARB should not apply a penalty of four to five times (when including the penalty for the pathway holder as a first reporter) the deficits if the fuel pathway CI is higher. This is excessive. CARB should apply one times the deficit and reset the CI score to the verified value and allow for rebalancing and readjustments by affected parties.

Section 95488.5. Lookup Table 7-1

- CARB should justify the significantly higher CI score for ULSD compared to the current rulemaking (105.76 vs. 100.45 gCO₂e/MJ).

Section 95488.6. Tier 1 Fuel Pathway Application Requirements and Certification Process

- In section (b)(2)(A), the deemed completed date should remain when CARB approved the submission, *before* the fuel pathway application is routed to the third-party verifier. Otherwise, the fuel pathway applicant will likely need to report for an extra quarter with the temporary CI score.

Section 95488.7. Tier 2 Fuel Pathway Application Requirements and Certification Process

- In section (d)(3): The deemed completed date should remain when CARB approved the submission, *before* the fuel pathway application is routed to the third-party verifier. Otherwise, the fuel pathway applicant will likely need to report for an extra quarter with the temporary CI score.

Section 95488.8. Fuel Pathway Application Requirements Applying to All Classifications

- In section (g)(1)(D), WSPA requests more detail on how the feedstock producers should be responsible for the attestation letter, if CARB maintains this new requirement, and what at what frequency the attestation letter needs to be renewed.
- In section (i), CARB should allow book-and-claim accounting for low-CI electricity, biomethane, and low-CI hydrogen for the production of renewable fuels as well, such as the production of renewable diesel.

Section 95488.9(b). Special Circumstances for Fuel Pathway Applications

For Temporary CI Scores (Table 8), CARB should explain and justify why it proposes to increase the CI scores of the temporary pathways by 5 gCO₂e/MJ for biodiesel and renewable diesel.

Section 95489. Provisions for Petroleum-Based Fuels

- In section (a), incremental deficit calculation for crude oil, WSPA notes that the equations for the baseline crude averages appear to be incorrect. Appendix E of the ISOR states that the equations for the three-year California Crude Average CI and California Baseline Crude Average CI contained in this section are being revised "*to be consistent with the updated Oil Production Greenhouse Gas Emission Estimator (OPGEE) model version, the updated Carbon Intensity Lookup Table for Crude Oil Production and Transport, and the implementation timeline of the amended regulation.*" However, it appears that the existing CI factors continued to be used in the $CI_{BaselineCrudeaAve}$ calculations. These CI factors should be updated to reflect the revised factors derived using OPGEE 3.0b (which are assumed to be the updated factors

listed in the updated Table 9).

- In section (a), fossil jet fuel and deficit calculation, CARB also proposes to add the following language to the E^{XD} parameter: *“For fossil jet fuel ($XD = \text{“fossil jet fuel”}$), E^{XD} is either produced in California or imported into California during a specific calendar year starting in 2028 and sold, supplied, or offered for sale in California.”* As drafted, this language would capture both intrastate and interstate jet fuel, which is expressly beyond the scope of CARB’s proposal. The added language should be revised to clearly state that the parameter should only include intrastate fossil jet fuel.
- In section (e)(1)(G), CARB should maintain the eligibility criteria for a project that generates at least 10,000 credits not to discourage GHG reduction projects.
- In section (e)(5)(B), CARB should not arbitrarily disallow refinery investment credits after 2040. The LCFS standards will be very stringent then and will need many crediting sources.
- In section (f)(5)(B), CARB should not arbitrarily disallow renewable hydrogen refinery credits after 2040. The LCFS standards will be very stringent then and will need many crediting sources.

Section 95491. Fuel Transactions and Compliance Reporting

- In section (b)(2) and table 12, CARB should change the third quarter reporting deadline as January 15, as the current deadline of December 31 is conflicting with holiday vacations.

GREET 4.0 Update Issues and Concerns

- **Modifications Incorporated in CA-GREET 4.0.**
 - A backhaul energy intensity was added to ocean tanker transport for Brazilian sugarcane. Though Appendix B indicates that this is based on data provided by fuel suppliers, this does not apply to all fuel suppliers. WSPA requests that pathways should determine whether a backhaul is included and verify it as part of the verification process. Additionally, barges and tugboats that move them within California waters since the passage of the 2022 Commercial Harbor Craft (CHC) Regulation are utilizing renewable diesel. The CO₂ portion of the emissions from the CHC should not be counted as part of the emission factor for the use of barges in GREET. Like backhaul, pathway holders should be able to petition CARB to reduce emissions from the use of barges within California water as part of the verification process.
 - **Density and Carbon Content Inputs.** From CA-GREET3.0 to CA-GREET4.0, the density and percent carbon content in fuels changed with updates from GREET2016 to GREET2022. The fuel low heating value (LHV) has also been updated separately in CA-GREET4.0 to match the LRT-CBTS reporting system. These data points are then used to determine the tailpipe CO₂ emissions of various fuels. For California diesel, the changes result in a ~2 g/MJ increase of the baselines default values. We are uncertain of whether the combination of LHV and density/percent carbon content reported in CA-GREET4.0 are accurate as they are obtained from different sources. The LHV is dependent on the density and percent carbon content of the fuel and therefore, CARB should be using a consistent basis when updating the values.
 - **Tailpipe Emission Factors.** It appears that CARB updated GREET2022 transportation and tailpipe emission factors with data from the EMFAC2021 (v1.0.2) model, which reflects significant changes in ULSD tailpipe nitrous oxide (N₂O) emissions, from 0.724 g/MJ in CA-CA-GREET3.0 to 3.49 g/MJ in CA-GREET4.0. However, it seems tailpipe N₂O emissions for lower emission fuel pathways, such as biodiesel and renewable diesel, are based on a different data source and consistent with the CA-GREET3.0 data. We request that CARB explain this choice as CARB should treat all fuels under a consistent framework for model input and output accuracy.

- **Natural Gas.** CARB should update the methane fugitive factors by using GREET 2022, not the obsolete factors from GREET 2014.
- **Tallow energy use.** CARB should update the tallow energy use with the data from GREET 2022, not the obsolete value from GREET 2016.
- **Expirations.** WSPA is concerned with any potential of pathways that were developed under CA-GREET 3.0 expiring as CARB transitions to CA-GREET 4.0. To maintain consistency in the program and minimize disruptions, current pathways should remain open during the transition from GREET 3.0 to GREET 4.0.
- **Data Assumptions.** WSPA requests that CARB provide data sources used to update electricity transmission and distribution losses in the model.

WSPA appreciates the opportunity to provide comments. If you have any questions regarding this submittal, please contact me via email at tderivi@wspa.org.

Sincerely,



Tanya DeRivi
Senior Director, California Climate and Fuels



Jim Verburg
Director, Fuels

August 8, 2022

Sent via e-mail and upload to: https://www.arb.ca.gov/lispub/comm/iframe_bcsbform.php?listname=lcfs-wkshp-jul22-ws&comm_period=1&_ga=2.85577753.167319428.1658172472-237475923.1631295388

Dr. Cheryl Laskowski
Branch Chief – Low Carbon Fuel Standard
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: WSPA Comments on CARB Workshop to Discuss Potential Changes to the LCFS

Dear Dr. Laskowski,

Western States Petroleum Association (WSPA) appreciates the opportunity to comment on the staff presentation at California Air Resources Board (CARB) Workshop to discuss potential changes to the Low Carbon Fuel Standard (LCFS) held on July 7, 2022. WSPA is a trade association that represents companies that provide diverse sources of transportation energy throughout the west, including California. This includes the transport and marketing of petroleum, petroleum products, natural gas, renewable fuels, and other energy supplies.

Provided below is WSPA's initial feedback on CARB's proposed changes in the LCFS Program as presented to stakeholders by CARB staff on July 7, 2022:

LCFS is a Critical Part of California's Climate Portfolio - The last bullet point on Slide 9 of the CARB staff presentation states: *"Providing long-term price signals needed to support transition to ZEVs and decarbonizing remaining liquid fuel demand."* The LCFS program should remain fuel/energy carrier neutral and not privilege ZEV technology to the detriment of liquid or gaseous fuels. The carbon intensity (CI) is the referee in the LCFS program, so if a liquid or gaseous fuel with low CI values can compete with ZEV technology, CARB should ensure these technologies remain available in the program and are treated fairly, as enablers of carbon reductions.

Accelerating 2030 Target to 25% or 30% - The CARB staff presentation (Slide 12) introduced a proposal to potentially accelerate the LCFS (CI) reduction targets to 25% or 30% by 2030. WSPA is concerned that this proposal has been presented to stakeholders without the illustrative compliance scenarios necessary to demonstrate potential pathways to achieving these targets. WSPA encourages CARB to hold a series of workshops focused on this topic and direct engagement with stakeholders as soon as possible. The illustrative compliance scenarios should, at minimum, include an assessment of the demand for low CI fuels among the western states and Canada as multiple low carbon fuel programs drive competition.

Post-2030 CI Targets - While setting aspirational long-term targets can be a signal to encourage investment in low-carbon alternatives, these targets would be arbitrary and established without sufficient underlying analysis and thus are unlikely to be effective. It is also important to note that the Scoping Plan already serves to provide direction for programs like the LCFS. As one of the key elements for a successful Scoping Plan, the LCFS should be focused on nearer-term goals that are supported by peer-reviewed analysis and proven technologies.

WSPA recommends that CARB set LCFS targets no further out than 2030 and consider setting targets for years that are currently more than 10 years out with the next rulemaking.

Market Signals versus Market Disruptions - CARB has built the LCFS program with an intent to provide a market signal for investment. WSPA member companies are working to support California's policy goals and reduce emissions in the transportation sector. WSPA is concerned about the broader impact of CARB's proposal to remove forklifts as a credit generator. This proposal tells regulated entities CARB is reviewing and determining which technologies are in or out of the program based on the metric of "maturity" without discussing the criteria it used to make this assessment. In 2015 when CARB brought into the LCFS the forklift crediting provision it did so with no expiration, subsequent credit provisions bolted onto the program have included expirations and limits that signal CARB's intent to monitor the adoption rates and perceived maturity of a technology. By introducing the concept that a credit provision can simply be stripped from the program creates a disruption. A logical follow up question is "what comes next?" WSPA opposes the concept of using an arbitrary term like "maturation" in the LCFS program, without any discussion on the criteria used to determine if a technology is mature.

MHD HRI/FCI Crediting - For both hydrogen refueling infrastructure (HRI) and fast charging infrastructure (FCI) crediting, WSPA encourages CARB to pursue a practical approach to calculating refueling facility capacities. It was suggested by CARB staff during the workshop that infrastructure credits would be assessed separately for light duty (LD) vehicles and medium/heavy duty (MHD) vehicles. CARB staff's current methodology for applying this distinction is to require separate infrastructure at each fueling location, meaning separate storage, piping, and dispensers for each vehicle type. This is an impractical, inefficient use of resources that will discourage facility expansion. If infrastructure credits are to be a part of the LCFS, they should be applied equitably and efficiently. WSPA urges CARB to work with stakeholders to find a practical solution for assessing the capacity of facilities serving both LD and MHD vehicles.

Arbitrary Pathway Caps - WSPA opposes arbitrary caps on fuel pathways. An example is crop-based biofuel. While we share CARB's concern for food security and any unintended consequences from low carbon fuel programs, a compelling case has not been presented for this proposal. Setting such limits requires a thorough, independent analysis that demonstrates a measurable impact to land use due to crop-based feedstocks used for fuel production. WSPA encourages CARB to continue prioritizing sustainability as part of the LCFS, but objects to any further limitations. CARB already establishes indirect land use change (ILUC) values for crop-based biofuels which is in addition to the production and transportation emissions that together makes up the CI value of the renewable fuel produced from crop-based feedstocks. Therefore, CARB should not create an additional penalty or set an arbitrary limit on the volume of crop-based feedstocks in the program. CARB should work to incentivize the production and use of feedstocks produced sustainably, not limit one of the most important and effective tools CARB has to reduce emissions from the transportation sector.

Pathway Approvals - WSPA believes that the current pathway application review process has inefficiencies that are cumbersome in workload burden to both CARB staff and pathway applicants. A significant restructuring of the process is recommended with input from regulated parties. At minimum, enhancements may include credit true-ups back to a facility's startup date and the approval of provisional pathways from startup of the renewable fuel production. WSPA requests that CARB adds in the LCFS regulatory language a deadline for CARB staff to review a pathway application. If CARB has not reviewed the pathway application within 60 days, the pathway application shall be deemed complete and opened for third-party verification.

Renewable Hydrogen Definition - WSPA believes that all renewable light hydrocarbons, not only biomethane and renewable natural gas (RNG), should have the same consideration as RNG in the LCFS regulation, including for the production of hydrogen. Renewable feedstocks should not be limited to pipeline quality biomethane and RNG in the production of renewable hydrogen. As such, facilities that produce both renewable fuels and hydrogen will utilize internally produced fuels like renewable ethane, renewable propane, renewable butanes, renewable pentanes, and renewable C6+ as feedstocks to produce hydrogen and should qualify for the production of renewable hydrogen. WSPA requests that the definition of renewable hydrogen be expanded to include the use of renewable light hydrocarbons for the production of renewable hydrogen. In addition, renewable hydrogen produced from renewable light hydrocarbons should qualify under the Hydrogen Refueling Infrastructure provision of the regulation for lower emission factors than hydrogen produced from fossil natural gas. The provisions above should apply regardless of whether the renewable feedstocks used to produce renewable light hydrocarbons are waste oils, fats, used cooking oil, distiller's corn oil or "fresh" vegetable oils, such as soybean or canola oils.

Verification - With verifications nearing completion for the second year under the LCFS, CARB should engage regulated parties and verifiers to seek feedback on the process and identify opportunities for improvement.

Aviation Fuel - WSPA would appreciate seeing more details regarding the proposal to obligate intrastate fossil jet fuel (i.e., where the point of obligation would be and how it would be executed). In general, WSPA believes that CARB cannot obligate jet fuel used for intrastate flights.

Much of the aviation industry is inherently interstate and international, making this sector particularly appropriate for the federal government to regulate. As such, 42 U.S.C. § 7573 preempts states from adopting or enforcing *"any standard respecting emissions of any air pollutant from any aircraft or engine thereof unless such standard is identical"* to USEPA's standards. On January 11, 2021, USEPA adopted new greenhouse gas (GHG) emission standards that apply to civil subsonic jet airplanes and larger civil subsonic propeller-driven airplanes.¹ Notably, the standards are equivalent to the airplane carbon dioxide standards adopted by the International Civil Aviation Organization in 2017.² In the preamble to the final rule, USEPA notes, *"These standards will ensure control of GHG emissions, maintain international uniformity of airplane standards, and allow U.S. manufacturers of covered airplanes to remain competitive in the global marketplace."*³ Thus, CARB should account for emission reductions in the aviation industry due to compliance with the new federal GHG emissions standards for airplanes, but should not presume that it can impose more restrictive emission standards than exist at the federal level.

In addition, intrastate fossil jet fuel represents a small fraction of jet fuel supplied in California and jet fuel suppliers do not know how much of the fuel is consumed intrastate versus interstate or out of the country. This makes compliance with the proposed obligation extremely complicated.

¹ Control of Air Pollution From Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures, 86 Fed. Reg. 2136 (Jan. 11, 2021).

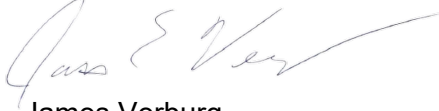
² *Id.* at 2137.

³ *Id.* at 2138.

Dr. Cheryl Laskowski
August 8, 2022
Page 4

WSPA appreciates the opportunity to provide comments on this important regulatory process. If you have any questions regarding this submittal, please contact me at (360) 296-0692 or via email at jverburg@wspa.org.

Sincerely,



James Verburg
Director, Fuels





Jim Verburg
Director, Fuels

September 19, 2022

Sent via e-mail and upload to: https://www.arb.ca.gov/lispub/comm/iframe_bcsbform.php?listname=lcfs-wkshp-jul22-ws&comm_period=1&_ga=2.85577753.167319428.1658172472-237475923.1631295388

Dr. Cheryl Laskowski
Branch Chief – Low Carbon Fuel Standard
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: WSPA Comments on August 18th CARB Workshop to Discuss Potential Changes to LCFS

Dear Dr. Laskowski,

Western States Petroleum Association (WSPA) appreciates the opportunity to comment on the staff presentation at California Air Resources Board (CARB) Workshop to discuss potential changes to the Low Carbon Fuel Standard (LCFS), held on August 18, 2022. WSPA is a trade association that represents companies that provide diverse sources of transportation energy throughout the West, including California. This includes the transport and marketing of petroleum, petroleum products, natural gas, renewable fuels, and other energy supplies. Provided below is WSPA's initial feedback with references to the staff presentation slides¹ on CARB's proposed changes in the LCFS Program as presented to stakeholders by CARB staff on August 18, 2022:

Pathway Streamlining – Deemed Complete Date (Slides 9-13) – WSPA appreciates CARB's efforts to streamline LCFS program implementation. Although the alignment of deemed complete status reduces some confusion, changing the "*deemed complete date*" for Tier 2 pathway applications does little to streamline the pathway application process or resolve the issues with fuel pathway processing. Currently, for Tier 2 applications, the deemed complete date has little effect on credit generation, given that application reviews and validations are taking several months to complete. Ultimately, availability of the certified pathway often occurs multiple quarters after the deemed complete date. To achieve substantive changes in application processing, WSPA recommends that CARB incorporate into the regulation a deadline of 30 calendar days for CARB to review fuel pathway applications. If the applications are not reviewed within 30 days, the pathway application process should move on to the next step, such as the third-party validation step or the fuel pathway certification step. WSPA also recommends that CARB set staffing levels such that smooth and effective fuel pathway review processes can be achieved.

Temporary Pathway Credit True-Up (Slides 14-18) – WSPA supports the CARB staff proposal to true-up temporary fuel pathways with provisional and operational CI values. As CARB staff develops the draft regulatory language to implement this true-up element, we offer several factors to consider:

- The true-up should cover all volumes reported back to the first quarter during which the temporary pathway was used. Slide 16 suggests that it would be the first "full" quarter. This is an unnecessary limitation.

¹ <https://ww2.arb.ca.gov/sites/default/files/2022-08/August%202022%20Workshop%20Slide%20Deck%20Presentations.v16.pdf> – Accessed 9-12-2022

- True-ups should be automatic. Once CARB has certified a provisional or permanent pathway, credits should be added to the applicant's LRT-CBTS account without any administrative approval step.
- It is possible that a pathway holder may not be the fuel reporting entity for their pathway. In that case, they should have the option to designate another party to receive the true-up credits as part of their pathway application.
- True-ups should be applicable to pathways under review at the time that the regulatory changes take effect, including pathways still under provisional status.

WSPA also supports the proposal made during the public comment period to extend true-ups to the annual fuel pathway reporting process as well. Following verification, fuel pathway holders should be rewarded for incremental improvement in their operational carbon intensity. Doing so on an annual basis would reduce the need for pathway holders to reapply for their pathways to capture the value of operational improvements.

Hydrogen Tier 1 Calculator (Slides 19-23) - WSPA supports the establishment of a Tier 1 calculator for hydrogen. For a rapidly growing segment of the California LCFS program, this proposal may serve to streamline hydrogen applications so that focus can be placed properly on other complex Tier 2 pathways. For hydrogen pathways produced by steam hydrocarbon reforming, WSPA requests that CARB incorporate into the Tier 1 calculator all renewable hydrocarbons, (other than biomethane or renewable natural gas) as acceptable components to produce renewable hydrogen. An illustrative example is a renewable fuel facility that produces renewable propane as a co-product resulting from the conversion of renewable feeds to produce renewable diesel and/or alternative jet fuel. The renewable propane can be sent to the hydrogen plant as feedstock or used as thermal energy in the process heater for the hydrogen plant. Thus, the hydrogen derived from that portion of the renewable propane should be recognized as renewable hydrogen and should qualify for the hydrogen refueling infrastructure crediting program.

EMFAC Model Estimation (Slide 45) – WSPA does not support the use of EMFAC as a source of data for generating base credits for residential EV charging. EMFAC's primary purpose is to estimate the emissions inventories of on road mobile sources in California in the aggregate. CARB staff Slide 45 states: "*EMFAC is not designed to estimate residential PEV charging - estimates are not intended to reflect charging behavior*" and "*modifications would need to be made to transform model outputs into an estimate of residential PEV charging*". As such, EMFAC may not be the best tool for accurately calculating credits for residential EV charging.

WSPA appreciates the opportunity to provide comments on this important regulatory process. If you have any questions regarding this submittal, please contact me at (360) 296-0692 or via email at jverburg@wspa.org.

Sincerely,



James Verburg
Director, Fuels





Tanya M. DeRivi

Vice President, Climate Policy

December 21, 2022

Dr. Cheryl Laskowski
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Sent via upload to:

https://www.arb.ca.gov/lispub/comm2/bcsubform.php?listname=lcfs-wkshp-nov22-ws&comm_period=1

Re: WSPA Comments on November 9 CARB Workshop regarding Potential Changes to LCFS

Dear Dr. Laskowski,

The Western States Petroleum Association (WSPA) appreciates the opportunity to comment on the staff presentation at the California Air Resources Board (CARB) workshop to discuss potential changes to the Low Carbon Fuel Standard (LCFS), held on November 9, 2022. WSPA is a trade association that represents companies that provide diverse sources of transportation energy throughout the west, including California. This includes the transport and marketing of petroleum, petroleum products, natural gas, renewable fuels, and other energy supplies.

Provided below is WSPA's feedback regarding the CARB staff presentation¹ on proposed changes in the LCFS Program as provided to stakeholders on November 9. WSPA has previously submitted comments to CARB staff pursuant to the CARB's July 7 and August 18 LCFS workshops. Those comments are incorporated into this letter by reference.^{2,3}

CATS Model Overview (Slides 12-21)

The California Transportation Supply (CATS) Model is intended to develop optimized scenarios based on the user input. CARB needs to assess that the basis for its inputs to CATS are technically sound, in particular for emerging technologies. WSPA recommends that CARB develop sensitivity analysis for different input variables, including (but not an exhaustive list):

- Various gasoline demand scenarios, including flat gasoline demand or gasoline demand not dropping as fast as expected in the original scenario.
- Different electricity prices, as the cost of electricity seems to be too low if set at 80 \$/MWh as stated in Slide 16. The United States Energy Information Administration (EIA) recently reported that in September 2022, the "average price of electricity to ultimate customers" for the transportation sector in California was 15.63 cents/KWh (equates to 156.30 \$/MWh).⁴ In addition, modeled scenarios for future years should take into account upward pressures on electricity rates such as those presented by the California Energy Commission in their

¹ <https://ww2.arb.ca.gov/sites/default/files/2022-11/LCFSPresentations.pdf>

² Western States Petroleum Association. "WSPA Comments on CARB Workshop to Discuss Potential Changes to the LCFS", August 8, 2022.

³ Western States Petroleum Association. "WSPA Comments on the August 18th CARB Workshop to Discuss Potential Changes to the LCFS", September 19, 2022.

⁴ https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_5_6_a.

September 21, 2021, Demand Analysis Working Group which shows forecasted statewide commercial and residential rates greater than 20 cents/KWh in 2030 and beyond.⁵

- A range of crude oil price ranges, rather than a single 90 \$/barrel proposed on Slide 16 and Table 4 of the CATS documentation.

CATS should also model the additional cost of electricity for building up the electric vehicle (EV) charging infrastructure and the construction of additional power generation.

Table 8 of the “Draft California Transportation Supply Model – Technical Documentation” (hyperlink to document provided on Slide 21) shows a significant difference between the fixed cost of CARBOB production and the fixed cost of ultra-low sulfur diesel (ULSD) production. WSPA requests that CARB provide more information on how these fixed costs are established as ULSD and CARBOB are co-produced at oil refineries. CARB should also confirm whether the biodiesel equivalence value under the United States Environmental Protection Agency’s Renewable Fuel Standard (RFS) program should be 1.5 rather than 1.4 as stated on Page 20 of the “Draft California Transportation Supply Model – Technical Documentation.”

CATS Summary Input Spreadsheet – Fuel Production Tab – Exogenous Subsidy (Slide 21)

In reviewing the “core model inputs” (hyperlink to spreadsheet provided on Slide 21), WSPA requests that CARB staff confirm if the 0.369 \$/MJ value of compressed natural gas (CNG) is correct, or if it should instead be 0.0369 \$/MJ. The 0.369 \$/MJ corresponds to nearly \$390 million per BTU – which seems very high. It is also requested that CARB provide the basis for the renewable gasoline 0.019 \$/MJ exogenous subsidy.

Scenario Design: Carbon Intensity (Slides 25-26)

WSPA is concerned about the current pace of the LCFS rulemaking. CARB proposes to significantly accelerate near-term LCFS targets and potentially extend targets as far out as 2045. However, CARB staff is just beginning to assess potential compliance scenarios. The presentation during the November 9 workshop described high-level compliance curves, with little transparency into the methodology and no discussion of feasibility. To meet a January 2024 implementation date, these scenarios need to be presented in a more comprehensive manner, with transparency and significant stakeholder input. Without that, it is difficult to comment on the three compliance curves presented. Consequently, we can only comment on the modeling inputs described by CARB staff.

For example, Slide 6 shows that the program only slightly “overperformed” – by 0.61% carbon intensity (CI) reduction in 2021 (9.36% CI reduction vs. 8.75% CI target) – which is only about half of the current annual increase in the CI benchmark. If the pace of adopting Zero Emission Vehicles does not occur as planned into 2030, the number of deficits will far exceed any credits being generated. Yet this scenario is not being evaluated as part of the scenarios. As a result, CARB should be careful in setting more stringent CI standards and ensure that the new CI standards do not quickly exhaust the credit bank.

In addition, CARB should include in the proposed regulatory language a provision that stipulates a formal annual program review with an option to reset the benchmarks in the event that credit generation falls short or/and deficit generation is higher than expected.

⁵ CEC Demand Analysis Working Group (https://www.energy.ca.gov/sites/default/files/2021-09/1%20Electricity%20Rate%20Forecast%20Updates_ADA.pdf) – Accessed 12-15-2022

Crop-Based Biofuel (Slides 28-29)

As WSPA stated in our August 8 comment letter, no arbitrary limit should be set on crop-based feedstock. Any concerns around land use impacts are handled in feedstock carbon intensity calculations. Indirect Land Use Change (ILUC) values already increase the CI score of renewable fuel produced from crop-based feedstocks, resulting in lower emission reductions attributable to the fuels. An artificial limit on supply is not the appropriate method of accounting for these impacts.

Food supply concerns are similarly addressed by ILUC inputs to carbon intensity scores. It is noteworthy that the 2018 LCFS readoption evaluated several different fuel supply scenarios⁶ with varying amounts of biodiesel and renewable diesel available to support the LCFS's goal of reducing the CI of fuels in California 20% by 2030. The scenario chosen to illustrate a feasible program estimated the growth of biodiesel and renewable diesel would be on the order of 146% (and evaluated growth up to a 215% increase) from 2018 levels through to 2030. Much of the anticipated growth in these fuels has already been considered by CARB, including potential land use impacts and other factors⁷. Today, feedstock availability is aligning with expectations from the 2018 LCFS readoption. As shown in the 2018 illustrative compliance calculator,⁸ CARB forecasted the CIs for biodiesel and renewable diesel to be 34 gCO₂e/MJ for biodiesel and 30 gCO₂e/MJ for renewable diesel into 2030. As of Q2 2022, CARB has reported⁹ average CI values of 27.51 gCO₂e/MJ for biodiesel and 35.96 gCO₂e/MJ for renewable diesel. Given investments taking place, additional restrictions should not be created as anticipated growth of these fuels and impact to land use has already been considered.

Additionally, no data has been presented by CARB or other stakeholders suggesting that any threat to food supply has been created by growing biofuel demand. It is noteworthy that while CARB is proposing limits on crop-based feedstock, the proposed regulation encourages the increased development of renewable electricity sources (specifically solar) which will undoubtedly result in the conversion of agricultural lands. WSPA believes that this duplicity in policy is concerning and sends a mixed message to stakeholders.

Rather than establish artificial limits on crediting for specific fuels, WSPA encourages CARB to continue analyzing land use change factors and focus on CI score accuracy. WSPA also requests that CARB define the term "virgin crop-based oil." Specifically, the definition should not include cover crops. Cover crops are used to slow erosion, improve soil fertility and quality, and help control pests and diseases.

Biomethane Crediting (Slides 30-32)

CARB staff presented potential scenarios for limiting crediting for biomethane, including arbitrary geographical limits and a phase-down of avoided methane crediting without providing a clear approach as to how CARB would implement these changes. For example, it is not clear whether or not the gas to a hydrogen production facility (a legacy pathway not tied to a landfill renewable natural gas (RNG) facility book-and-claim) would be removed from crediting as of 2030. Clarity around considerations such as this is important for stakeholders to understand and to provide meaningful feedback. Because biomethane crediting has been a major contributor to the success of the LCFS program, to arbitrarily limit those credits threatens the continued success of the program. It is also contrary to the technology neutral, market-based nature of the LCFS program.

⁶ CARB 2018 rulemaking. [Illustrative Compliance Calculator](#).

⁷ CARB 2018 [Environmental Analysis](#).

⁸ *Supra*, tab "Calculations" Row's 57 and 58.

⁹ CARB LCFS [Quarterly Data Spreadsheet](#).

CARB cited a desire to focus biomethane use in hydrogen production and non-transportation use. The proper way to do so is to establish incentives that encourage use in those applications, rather than simply removing incentives elsewhere. As producers discussed during the November 9 workshop, such an approach is more likely to slow or even reverse investments in methane capture. Rather than limit crediting for biomethane under the LCFS, CARB should be looking for ways to establish credit, such as removing the limit on book-and-claim treatment for biomethane used for process energy in refineries and crude production facilities.

Further, WSPA believes that CARB should not attempt to harmonize RNG with electricity (see Slide 32) as the natural gas pipeline is vastly different from the electricity grid. For example, there is more flexibility to move gas longer distances than the electric grid is capable of. If Alternative A or B is adopted, then CARB should grandfather in all current pathways that have RNG facilities located outside of the “Western NG network” as project investment was based upon dispensing in California.

Other Modeling Assumptions Under Consideration (Slide 35)

CARB included a phase out of petroleum project-related crediting in two of the scenarios presented without describing the rationale behind such a change. Given that all scenarios involve continued use of petroleum products in the coming decades, it is contrary to the goals of the LCFS program to discourage carbon reduction projects at crude production and refining facilities.

Rather than arbitrarily constrain these credits without science-based drivers, CARB should be removing current barriers to qualification. Innovative Crude credits are currently restricted to a discrete set of technologies and should be expanded to enable emerging technologies and efficiency investments that reduce carbon emissions. Similarly, the use of biomethane in both crude production and refining facilities should be allowed book-and-claim treatment.

WSPA continues to object to the addition of deficits for intrastate fossil jet use. This is a needlessly complicated addition to the program for a very small portion of jet fuel demand in the State. It would have little impact on alternative jet fuel demand and create considerable work for aviation stakeholders, CARB staff, and verifiers (i.e., fuel producers and importers do not know who controls how much of the jet fuel that is consumed in intrastate flights – nor do they have access to this information). However, if CARB decides to implement such a LCFS obligation on intrastate jet fuel, the obligation should not be borne by fuel producers or importers.

WSPA appreciates the opportunity to provide comments on this important regulatory process. If you have any questions regarding this submittal, please contact me at via email at tderivi@wspa.org.

Sincerely,



Tanya DeRivi
Vice President, Climate Policy



Tanya M. DeRivi

Senior Director, Climate Policy

March 15, 2023

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https://www.arb.ca.gov/lispub/comm2/bcsubform.php?listname=lcfs-wkshp-feb23-ws&comm_period=1

Re: WSPA Comments on CARB Preliminary Discussion Draft of Potential Low Carbon Fuel Standard Regulation Amendments and February 22, 2023 LCFS Workshop

Dear Dr. Laskowski,

The Western States Petroleum Association (WSPA) appreciates the opportunity to comment on the Preliminary Discussion Draft of Potential Low Carbon Fuel Standard (LCFS) Regulation Amendments and the associated staff presentation at the California Air Resources Board (CARB) workshop, held on February 22, 2023. WSPA is a trade association that represents companies that provide diverse sources of transportation energy throughout the west, including California. This includes the transport and marketing of petroleum, petroleum products, natural gas, renewable fuels, and other energy supplies.

In considering potential amendments to the LCFS Regulation, it is essential to recognize that LCFS adds approximately 11 cents per gallon to the cost of California gasoline according to the California Energy Commission.¹ While California continues to face serious supply constraints as it relates to transportation fuels and the California legislature considers how to provide relief at the pump for California drivers, CARB should ensure that its proposed LCFS regulation amendments do not increase costs uniquely impacting California fuels. Proposed amendments including arbitrary caps on alternative fuel pathways, hydrogen production and a self-ratcheting mechanism, among other amendments, will likely increase costs of California fuels. WSPA is generally concerned with proposed amendments to the LCFS regulation that could further compromise the supply reliability of critical transportation fuels, a consequence of which could be increasing energy costs at a time when energy affordability is a pressing priority for many Californians.

The LCFS program is primarily a liquid fuels program, for which WSPA members have made significant investments to help make the program both successful and replicable. WSPA supports LCFS and believes that the program should continue to provide an appropriate market signal that incentivizes the production of low-carbon intensity (CI) fuels. The LCFS should continue to preserve consumer choice and provide a level playing field for all technologies. The market-based program should embrace fuel- and technology-neutral principles that focus on the meaningful and timely reduction of GHG emissions. Because step changes on CI stringency would be required upon adoption of final regulatory language starting as early as 2024, LCFS should provide a clear and durable market signal for investments in the production of lower CI technologies with sufficient time from adoption to implementation for obligated parties to plan for investments and deployment plans for technologies.

¹ Based on OPIS data; CEC staff presentations at <https://www.energy.ca.gov/event/workshop/2022-11/commissioner-hearing-california-gasoline-price-spikes-refinery-operations>

Provided below is WSPA's feedback regarding the Preliminary Discussion Draft of Potential LCFS Regulation Amendments and CARB staff presentation² from the February 22nd workshop. WSPA previously submitted comments pursuant to CARB's July 7th, August 18th, and November 9th LCFS workshops. Those comments are incorporated into this letter by reference.^{3,4,5}

General Comments

Arbitrary Caps on Alternative Fuels Pathways

CARB continues to discuss the concept of placing an arbitrary cap on crop-based fuels but has not yet presented data to demonstrate what problem the cap would address. CARB staff even mentions on Slide 37 that they have "*received limited data, analysis and supporting documents.*" Since there is no majority of stakeholders presenting a compelling argument in favor of such a significant programmatic change, this concept should be set aside unless a verifiable issue arises. In fact, an arbitrary cap on crop-based fuels would go against Health and Safety Code Section 38560, the statutory basis for CARB's proposed set of actions, which requires CARB "to achieve the maximum technologically feasible and cost-effective greenhouse gas emission reductions from sources."⁶ When all options must be on the table, CARB's concept would be *limiting* proven GHG reductions strategies that are technologically feasible and cost effective, and have garnered significant GHG reductions in the past.

We would also like to once again point out that CARB has already included a control mechanism for potential land use change concerns. This is precisely what the ILUC factors in CI modeling are meant to do, so additional limits are not needed nor appropriate. WSPA believes that adding an arbitrary cap would unnecessarily respond to an issue that was addressed long ago in the LCFS program.

Hydrogen Production

All hydrogen production pathways should be considered based on their CI reduction potential. Similar to what has been discussed above, a more robust hydrogen infrastructure has shown to be a technologically feasible, cost-effective way to reduce GHG emissions, which is what Health and Safety Code Section 38560 requires CARB to accomplish. WSPA does not support either the exclusion of hydrogen derived from fossil fuels from book-and-claim eligibility or the exclusion of hydrogen production by steam methane reforming in Medium- and Heavy-Duty Hydrogen Refueling Infrastructure (MHD-HRI) crediting. There is already a severe shortage of hydrogen refueling options across California (especially in relation to electric charging options) – just as CARB prepares to adopt the proposed Advanced Clean Fleets regulation that will demand the immediate and exponential growth of hydrogen refueling options for MHD vehicles.

We urge CARB to avoid proposed amendments that would arbitrarily constrain hydrogen production at a time when California consumers need more affordable fuel options – not less.

² <https://ww2.arb.ca.gov/sites/default/files/2022-11/LCFSPresentations.pdf>

³ Western States Petroleum Association. "WSPA Comments on CARB Workshop to Discuss Potential Changes to the LCFS", August 8, 2022.

⁴ Western States Petroleum Association. "WSPA Comments on the August 18th CARB Workshop to Discuss Potential Changes to the LCFS", September 19, 2022.

⁵ Western States Petroleum Association. "WSPA Comments on the November 9th CARB Workshop regarding Potential Changes to LCFS", December 21, 2022.

⁶ Cal. Health & Safety Code § 38560.

CATS Model

CARB staff stated at the February 22nd LCFS workshop that the California Transportation Supply (CATS) Model would be released within a week for stakeholders to evaluate and use. According to CARB's document, the CATS Model *"can be used to explore how different assumptions relating to the cost, supply, demand, and carbon intensities of various fuel may impact the transportation market, and how Low Carbon Fuel Standard credit prices may respond to changes in market conditions and program stringency."*⁷ WSPA subsequently inquired with CARB staff on the status and timing to comment when that week-long timeframe had passed. As the CATS modeling has yet to be released, we along with other stakeholders are unable to offer robust comments at this time.

Providing the CATS modeling with adequate review time would have helped stakeholders raise issues for CARB staff or to seek clarification from CARB staff regarding important input assumptions being used to inform CARB's modeling of future LCFS requirements. Even without the CATS modeling release, WSPA does have questions about various modeling assumptions, including cost of compliance, how feedstock pricing was established, inclusion of fixed cost regression for some fuel components, interim pricing for intrastate Sustainable Aviation Fuels, inflationary assumptions, costs associated with fossil fuel sales, and other important variables.

Specific Comments – CARB Staff Presentation

Slide 11 – Alternative Fuel Diversification

CARB staff rightfully noted in their introductory comments that *"LCFS drives investment and fuel diversification"* and that further investment is needed to meet accelerated targets. It is concerning, however, that CARB staff then proposed a number of changes that would scale back existing investments and discourage future growth. This includes dramatic increases in biogas carbon intensity, artificial caps on crop-based fuels, halving credits for ZEV forklifts, and phasing out crediting for GHG reduction at upstream and refining facilities. Further constraining fuel options just as CARB seeks to increase the program's stringency is the wrong approach for Californians. Such proposals would also go against Health and Safety Code Section 38560 which requires CARB to seek out technologically feasible, cost-effective GHG reduction mechanisms.

Slide 15 - Self-Ratcheting Mechanism

The second bullet on Slide 15 identifies as an element of the rulemaking scope: *"Mechanisms to auto-adjust CI targets to accelerate investment if program is over-performing."* WSPA recommends against a self-ratcheting mechanism that would auto-adjust the CI targets. We believe that rulemaking is the appropriate process to update the CI targets, because it is what is expected under basic principles of California administrative law,⁸ and because a self-ratcheting mechanism would defeat the spirit of the LCFS regulation, which is to allow banking of LCFS credits for future use as the program becomes more stringent over time. It would also not appear to account for exceptional circumstances, such as the COVID pandemic nor recessionary-driven slowdown, that have demonstrably significant impacts on the fuels market as well. A self-ratcheting mechanism may lead to an excessive use of LCFS credits in the short term to the detriment of long-term compliance

⁷ <https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard/lcfs-meetings-and-workshops>.

⁸ See Cal. Gov't Code § 11346.2 (discussing the notice-and-comment process); *POET, LLC v. State Air Res. Bd.*, 218 Cal. App. 4th 681, 744 (2013), *as modified on denial of reh'g* (Aug. 8, 2013) ("agencies must . . . (1) give the public notice of the proposed regulatory action; (2) issue a complete text of the proposed regulation with a statement of reasons for it; (3) give interested parties an opportunity to comment on the proposed regulation; (4) respond in writing to public comments; and (5) maintain a file as the record for the rulemaking proceeding").

options. Further, such mechanism fails to provide market certainty.

Slide 16 - Rulemaking Process

CARB staff lays out a very general rulemaking process on Slide 16 without discussing timing. Given the progress to date on this rulemaking, WSPA urges CARB staff to identify an achievable implementation date for any regulatory changes made and to publish a detailed rulemaking calendar.

Slide 25 (and Slide 52) - Compliance Target Step Down and Acceleration Mechanism

This is the first workshop during which CARB officially discussed the concept of an “acceleration mechanism.” We find this concept concerning as it shortcuts the deliberative, public process of a formal rulemaking (i.e., an “acceleration mechanism” could remove credits from the bank too quickly and risk rendering the program infeasible in the later years when the CI standards become ever more stringent) which the public is entitled to under basic administrative law principles in California.⁹ The credit bank should be looked to as a long-term compliance option. We also believe that any market indicators identified could result in serious unintended consequences such as credit shortages or market volatility. With the concept under consideration, such consequences could only be addressed through emergency actions by CARB, followed by an immediate rulemaking.

Regarding the potential triggers CARB listed, a credit price trigger is the least appropriate. While the LCFS is intended to spur investment, CARB should not seek to fix prices. The price cap in the Credit Clearance Market is there as a relief valve to avoid harmful spikes. Setting an effective price floor would represent market manipulation. Furthermore, markets are volatile. Establishing a price trigger could lead to frequent, disruptive alterations to compliance targets. Adding such volatility to California’s fuel market would be highly inadvisable.

However, of the triggers CARB identified, the total credit bank size would be the most appropriate. If the credit bank size were used as a trigger, it would obviously behoove CARB to include automatic “deceleration” of targets should the credit bank become very low or negative. It is unclear what “credit to deficit ratio” means as a trigger for changing targets.

Finally, the LCFS credits modeled by CARB is above the maximum allowed credit price, which indicates a shortage of credits. Therefore, no step-change should be considered in the program. Rather CARB should establish CI standards that can be met while maintaining the LCFS credit price below the maximum allowed price.

Slide 29 - ZEV Refueling Infrastructure

While the replication of the light-duty ZEV refueling infrastructure language for medium- and heavy-duty vehicles is appreciated, it is critical that CARB staff identify a reasonable mechanism for modeling “hybrid” stations to avoid creating a requirement for the duplication of storage-to-dispensing infrastructure.

Slide 32 - Methane Crediting

CARB staff cited a desire to focus biomethane use in hydrogen production and non-transportation use. The proper way to do so is to establish incentives that encourage use in those applications, rather than simply removing incentives elsewhere. As stakeholders discussed this issue during

⁹ Please see discussion in Footnote 7.

previous LCFS workshops, such an approach is more likely to slow or even reverse investments in methane capture. Rather than limit crediting for biomethane under the LCFS, CARB should be looking for ways to *establish* credit, such as removing the limit on book-and-claim treatment for biomethane used for process energy in refineries and crude production facilities.

WSPA also believes that Avoided Methane Crediting is needed to support current and future investment and project development. These credits for methane – that was previously emitted or flared – are key components of dairy renewable natural gas (RNG) investments and should be preserved to ensure the maximum production of clean fuels and emission reductions.

Further, WSPA recommends that CARB not attempt to harmonize RNG with electricity as the natural gas pipeline is vastly different from the electricity grid. For example, there is more flexibility to move gas longer distances than the electric grid is currently capable of.

Slide 35 - Intrastate Jet Fuel

WSPA continues to object to the addition of deficits for intrastate fossil jet use. This is a needlessly complicated addition to the program for a very small portion of jet fuel demand in the state. It would have little impact on alternative jet fuel demand and create considerable work for aviation stakeholders, CARB staff, and verifiers. Crediting for alternative jet fuel is based on delivery to airport storage, while the proposed deficits would be based on consumption during intrastate flights. Given that, blending more alternative jet fuel would not reduce the deficits generated by airlines for intrastate flights. This means that these added deficits would simply make the airlines credit purchasers in the program and would not incentivize increased blending of alternative jet fuel.

If CARB decides to implement a LCFS obligation on intrastate jet fuel, WSPA agrees that the obligation should not be borne by fuel producers or importers (but rather the airlines that will use the jet fuel) as fuel producers and importers do not control the volume of jet fuel that is used for intrastate travel. This would enable more direct tracking of intrastate jet consumption.

Slides 36-41 - Crop-Based Fuels

As a follow-up to the General Comment above and consistent with past WSPA comment letters, no arbitrary limit should be set on crop-based feedstock. A free-market CI based policy should drive technology choices and there should not be additional prohibition mechanisms in favor/or against certain technologies. ILUC values already increase the CI score of renewable fuel produced from crop-based feedstocks, resulting in a lower economic value for these fuels compared to fuels produced from waste-based feedstocks. CARB should let the market optimize the fuel slate based on market economics and feedstock availability and not set arbitrary constraints.

WSPA further suggests that Best Farming Practices be included in, and accounted for, within the program CI calculation methodology to properly credit “climate smart” agricultural practices. Doing so would recognize the projected GHG mitigation and carbon sequestration benefits associated with ongoing or new and innovative farming practices associated with the intentional production of climate-smart commodities (e.g., reduced use of fertilizer, targeted fertilizer nutrients, soil carbon sequestration, etc.).

Slide 43 - Project-Based Crediting – Phase Out

WSPA objects to an artificial phase out of project-based crediting and limiting the duration of the crediting period of these projects, as project-based crediting incentivizes incremental GHG emission

reductions. Such an approach is arbitrary and discourages investment in real GHG reduction investment at refineries and oil producing facilities. Rather than arbitrarily constrain these credits without science-based drivers, CARB should be removing current barriers to qualification. Innovative Crude credits are currently restricted to a discrete set of technologies and should be expanded to enable emerging technologies and efficiency investments that reduce carbon emissions – especially given the strong and long-term demand for these fuels identified in the 2022 Scoping Plan Update.

Similarly, the use of biomethane in both crude production and refining facilities should be allowed book-and-claim treatment. Restricting book-and-claim for RNG to CNG transport outlets but not for hydrogen feedstock dispositions again seems to be attempting to pick “winners and losers” based upon long-term speculative market forecasts. We continue to support a free market-based policy and level playing field for various RNG pathways. To that end, we support maintaining the robust tracking, traceability, and documentation requirements and continuing to allow book-and-claim from all existing geographies for all RNG pathways, as this represents the best path forward to achieve more stringent LCFS targets.

Slide 48 - LCFS Modeling Framework

WSPA requests detailed clarification of the CATS Model assumptions. Areas of concern identified from information available to date include but are not limited to the following:

- The model does not appear to be tracking any possible increase in the cost of fossil fuel sales in the model (or are not explaining how it is included), which may incorrectly increase the cost of compliance.
- Inflation does not seem to be factored into the model; more clarification is needed on assumptions and methodology.
- The Sustainable Aviation Fuel (SAF) model appears to reflect only the interim SAF pricing in years 2023-24 versus 2025-27. It is not clear if an entity can carry this forward beyond the years approved. The model is showing soybean oil SAF with a \$1.25/gallon subsidy at 50% CI reduction, or 42 CI. This indicates the assumptions used citing the federal Inflation Reduction Act are based on 40B New SAF credits rather than 45Z New Clean Fuel Production credits, which would make better sense.
- More clarity is needed as to how feedstock pricing was established.
- More clarity is needed as to whether the model is assuming an infinite amount of virgin oil feedstock available, driven only by increasing price.
- More clarity is needed on how the model estimates higher fossil and agriculture benchmark costs, relative to historic values.
- The fixed cost regression for FAME and Renewable Diesel is confusing (as well as the one for CARBOB and ULSD) – additional clarification is needed.
- While the model has a fixed price of \$1.45/RIN for D4s and FAME RIN equivalence of 1.4 (vs 1.5) and D6s are modeled at \$1.13/RIN, a reference for D3s cannot be found.

Slides 49-51 - LCFS Modeling Outputs

Slides 49 and 50 show a significant destruction of gasoline demand over time, yet the diesel pool continues to have a sizable proportion of petroleum diesel. WSPA suggests that CARB evaluate an alternative scenario where the entire pool of petroleum diesel is replaced with renewable diesel and biodiesel blends over the next few years. As alternative fuels saturate the market to near-completion, there should be a step change in credit generation that slows credit generation; it is more difficult to substitute petroleum CARBOB with renewable fuels, due to several constraints,

including ethanol blending limits. In particular, if the growth of electric vehicles does not materialize as fast of CARB's current prediction, the deficit generation from CARBOB may be challenging to balance with credits. This uncertainty should also be modeled.

Slide 51 shows the LCFS credit price going over the maximum credit price which suggests a shortage of credits to balance the deficits. Therefore, WSPA requests that CARB also model a CI standard curve where the LCFS credits remain below the LCFS maximum credit price throughout the duration of the modeled period. Another modeling scenario CARB should consider is incorporating the bank of credits held by firms today, by including the credit bank in any forward forecast; including the credits will allow stakeholders to assess how CARB's potential updates will impact the current market.

Slides 62-64 - Updates to Tier 1 Calculators

WSPA supports the development of a new hydrogen calculator. CARB should also include options for renewable hydrocarbon feedstocks, such as renewable propane and other renewable hydrocarbon and hydrocarbon mixtures (such as ethane, propane, butane, etc.) in the steam reforming hydrogen calculator.

In addition, WSPA requests that CARB update the definition of renewable hydrogen to allow infrastructure crediting for hydrogen fuel produced from renewable hydrocarbons other than biomethane/renewable natural gas, by including renewable ethane, renewable propane, renewable butane and other renewable hydrocarbons and a mixture thereof.

Slide 69 - OPGEE

WSPA requests that CARB eliminate the incremental deficit provision from imported petroleum CARBOB and petroleum ULSD (CARB diesel). CARBOB and ULSD produced at refineries outside California do not process the same crude slate as the crude slate processed in California, and therefore, the incremental deficit calculations are not relevant for imported products.

WSPA also requests that CARB release the latest dataset from 2019 used to establish crude baselines in OPGEE. This is an important step to maintain the model's transparency.

Side 70 - Verification Updates

MCON (Crude) Reporting - Refineries should not need to report California crudes by field name in the MCON report as CARB is not using this information. CARB is using the data from the Department of Conservation. Therefore, no verification of California crudes should be required.

Site Visits - No site visit should be required other than for fuel pathway verification. Video conferencing and screen sharing are sufficient for other types of verification.

Quarter 3 LCFS Reporting Deadline - WSPA requests that CARB change the Q3 reporting date from December 31st to January 15th to allow time for the winter holidays.

Specific Comments – Proposed Regulatory Text

§95486.3(a)(1)(B): This section would require proposed MHD-HRI stations to be located in California within one mile of a Federal Highway Administration Alternative Fuel Corridor. WSPA

requests that CARB provide the rationale for placing limits on designated corridors and locations rather than leaving the market to define those locations based upon real world demands.

§95486.3(a)(1)(C): This section would allow application on MHD-HRI pathway application through December 31, 2029. WSPA requests that application submissions for light-duty HRI be extended to the same date as well in section §95486.2(a)(1)(B) and §95486.2(a)(7).

§95486.3(a)(2)(E): This proposed section references the HySCapE model. WSPA requests that CARB clarify if there will be a different version of the HySCapE model – one for heavy-duty and one for light-duty hydrogen fuel cell vehicles – or if the same HySCapE model will be used in any case.

§95486.3(a)(3)(A): This section includes an equation for estimating potential MHD-HRI credits. WSPA suggests that CARB consider additional language for exemptions and waivers considerations and provide clarity on credit equation for extreme cases where an approved station is not operational for an extended period after approval (extreme case).

§95486.3(a)(4)(B): This section requires that the station must be open to at least two different trucking companies. WSPA suggests eliminating this restriction on station owners.

§95486.3(a)(4)(D): This section requires that at least three Original Equipment Manufacturers have confirmed that the station meets protocol expectations, and their customers can fuel at the station. WSPA requests that CARB provide the reasoning behind this rigorous requirement.

§95486.3(a)(5): In the equation for the calculation of MHD-HRI credits, it appears that the CI_{HR} factor is not the same CI_{HR} factor delivered to the actual station (“... is the carbon intensity used for HRI crediting. Company-wide weighted average CI for dispensed hydrogen during the quarter or 0 g/MJ, whichever is greater”). WSPA requests further information on this CI input.

§95486.3(a)(6): In this section, certain requirements appear to include information that is competitively sensitive, business confidential information. WSPA requests that CARB identify how this information will be protected against disclosure. In addition, CARB needs to clarify what entities will have access to this information and why that access is necessary.

WSPA appreciates the opportunity to provide comments on this important regulatory process. If you have any questions regarding this submittal, please contact me at via email at tderivi@wspa.org.

Sincerely,



Tanya M. DeRivi



Tanya DeRivi

Senior Director, California Climate and Fuels

June 6, 2023

Dr. Cheryl Laskowski
Branch Chief – Low Carbon Fuel Standard
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Sent via upload to:

<https://ww2.arb.ca.gov/public-comments/public-comments-regarding-auto-acceleration-mechanisms-low-carbon-fuel-standard>

Re: WSPA Comments on CARB's Proposed Low Carbon Fuel Standard Auto-Acceleration Mechanism and May 23, 2023 Workshop

Dear Dr. Laskowski,

The Western States Petroleum Association (WSPA) appreciates the opportunity to comment on potential changes to the Low Carbon Fuel Standard (LCFS), to add a mechanism that would accelerate the carbon intensity benchmarks if certain conditions are met, and the associated staff presentation at the California Air Resources Board (CARB) workshop held on May 23, 2023. WSPA is a trade association that represents companies that provide diverse transportation energy resources throughout the west, including California. These include the transport and marketing of petroleum, petroleum products, natural gas, renewable fuels, and other energy supplies.

General Comments

In considering potential LCFS regulation amendments, it is essential to recognize that the LCFS adds approximately 11 cents per gallon to the cost of California gasoline according to the California Energy Commission (CEC).¹ As California continues to face serious transportation fuels supply constraints, the California legislature and the Governor recently approved legislation² attempting to address this fuel supply concern. This new statute requires CARB and CEC to prepare a Transportation Fuels Transition Plan “in consultation with the state’s fuel producers and refiners” that “shall include, at a minimum, a discussion of how to ensure that the supply of petroleum and alternative transportation fuels is affordable, reliable, equitable, and adequate.” WSPA looks forward to working closely with CARB and CEC to inform the Transition Plan’s development – where fuel affordability and equity must be central considerations to help inform policies under the baseline assumption that internal combustion engine vehicles (including hybrid vehicles) will be used and needed by Californians for decades to come.

While the LCFS program has a maximum credit sale or transfer price of \$200 (2016\$) it is important that CARB ensure the potential LCFS amendments recognize the impacts of a change to costs uniquely impacting California fuels. WSPA is extremely concerned with proposed amendments that could further compromise the supply reliability of critical transportation fuels and destabilize the program – a consequence of which could be increasing energy costs at a time when energy affordability is a pressing priority for many Californians. Proposed amendments like a one-way auto-

¹ Based on OPIS data; CEC staff presentations at <https://www.energy.ca.gov/event/workshop/2022-11/commissioner-hearing-california-gasoline-price-spikes-refinery-operations>.

² Senate Bill SB X1-2 (Skinner, 2023) https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202320241SB2.

acceleration mechanism, among other potential changes, will likely increase California fuels costs. Newly inserting an automatic mechanism would be wholly inappropriate and set a bad precedent for a program that was developed through and has been amended multiple times since by formal rulemaking processes.

WSPA members have made significant investments to help make the LCFS program both successful and replicable. WSPA supports the LCFS and believes the program should continue to provide an appropriate market signal that incentivizes the production of low-carbon intensity (CI) fuels. This market-based program should focus on providing clear, meaningful, durable, and timely market signals for the reduction of greenhouse gas emissions through investments in the production of lower CI technologies, with sufficient time from adoption to implementation for obligated parties to plan for investments and deploy technologies.

Specific Comments – CARB Staff Presentation

Provided below is WSPA's feedback regarding the auto-acceleration mechanism under consideration for potential LCFS amendments and the CARB staff presentation³ from the May 23rd Workshop. WSPA previously submitted comments pursuant to CARB's July 7, 2022, August 18, 2022, November 9, 2022, and February 22, 2023 LCFS Workshops. Those comments are incorporated into this letter by reference.^{4,5,6,7}

Slide 7 – Scope of Rulemaking. The second bullet point on Slide 7 identifies mechanisms to auto-adjust CI targets to accelerate investment if the LCFS program is overperforming. WSPA recommends against including a (one-way) auto-adjustment of the CI targets. We believe that rulemaking is the appropriate process to update the CI targets, because it is what is expected under the basic principles of California administrative law,⁸ and because such a mechanism would defeat the spirit of the LCFS regulation, which is to allow banking of LCFS credits for future use as the program becomes increasingly more stringent over time.

Instead of an auto-adjustment of the CI targets, WSPA suggests that CARB consider utilizing annual fuels forecasting to determine the need to adjust CI targets. For example, the Oregon Department of Administrative Services (DAS) annually completes a fuels forecast (pursuant to Oregon Administrative Rule 340-253-2100) to inform the Oregon Department of Environmental Quality (DEQ) as to the performance of the DEQ's Clean Fuels Program. A similar independent approach by CARB is encouraged for transparency and consistency.

An auto-adjustment of the CI targets would also appear to not account for exceptional circumstances – such as the COVID pandemic nor a recessionary-driven slowdown – that have demonstrably significant impacts on the fuels market. Instead, such an auto-acceleration mechanism may lead to

³ https://ww2.arb.ca.gov/sites/default/files/2023-05/LCFSPresentation_052223_0.pdf

⁴ Western States Petroleum Association. "WSPA Comments on CARB Workshop to Discuss Potential Changes to the LCFS", August 8, 2022.

⁵ Western States Petroleum Association. "WSPA Comments on the August 18th CARB Workshop to Discuss Potential Changes to the LCFS", September 19, 2022.

⁶ Western States Petroleum Association. "WSPA Comments on the November 9th CARB Workshop regarding Potential Changes to LCFS", December 21, 2022.

⁷ Western States Petroleum Association. "WSPA Comments on the February 22nd CARB Workshop regarding Potential Changes to LCFS", March 15, 2023.

⁸ See Cal. Gov't Code § 11346.2 (discussing the notice-and-comment process); *POET, LLC v. State Air Res. Bd.*, 218 Cal. App. 4th 681, 744 (2013), *as modified on denial of reh'g* (Aug. 8, 2013) ("agencies must . . . (1) give the public notice of the proposed regulatory action; (2) issue a complete text of the proposed regulation with a statement of reasons for it; (3) give interested parties an opportunity to comment on the proposed regulation; (4) respond in writing to public comments; and (5) maintain a file as the record for the rulemaking proceeding").

an excessive use of LCFS credits in the short-term to the detriment of long-term compliance options. Further, such a mechanism fails to provide the market certainty necessary to ensure petroleum and alternative transportation fuel supplies are affordable, reliable, equitable, and adequate as California's leaders seek to achieve.

Slides 11-12 – Compliance Target Step Down and Acceleration Mechanism Concepts. This was the first workshop where CARB officially discussed details of an “acceleration mechanism.” Previously, there was only one workshop where a broad concept was presented. WSPA finds the concept (and the late introduction of details) that introduces a complex structural change to the LCFS program at the very end of the informal rulemaking process concerning. Because such a mechanism could remove credits from the bank too quickly, it risks rendering the LCFS program infeasible in the later years when the CI standards become ever more stringent for regulated entities to comply with. Yet CARB provides no mechanism to *reverse* any unintended consequence of this action as the only options presented to date (including by third party stakeholders without compliance obligations) operate only to *increase* CI benchmarks.

WSPA believes this would be a significant enough structural change that further stakeholder discussion, analysis, and modeling is required. We strongly encourage CARB not to include the concept in the upcoming 45-day package to be released within the next several weeks and to instead separate it from the forthcoming rulemaking to allow for further discussion and evaluation.

Slides 15-25 – Different Ways to Implement the Auto-Acceleration Mechanism. WSPA believes incorporating an auto-acceleration mechanism into the LCFS program now would be premature. Compromising the health of the program without sufficient analysis, in an effort to artificially inflate LCFS credit prices, would be inappropriate and highly problematic by unnecessarily increasing programmatic and market complexities at a time when the transportation sector is already working through dramatic transformation. It also presumes that fuel supply and demand scenarios will perform as envisioned to meet the ambitious 2022 Scoping Plan Update goals – that supply will phasedown in line with demand – despite known uncertainties in the energy market itself rather than seeking to ensure supply and demand for liquid fuels remains harmonious.

The credit bank is and should continue to be looked to as real emission reductions that regulated entities may use as a long-term compliance option. We also believe that any market indicators identified could result in serious unintended consequences such as credit shortages or market volatility. With the concept under consideration, such consequences could only be addressed through emergency actions by CARB, followed by an immediate rulemaking.

Should CARB proceed with incorporating this concept into the program through the upcoming formal rulemaking process, WSPA believes that additional work and stakeholder engagement is necessary. This should also include incorporating a means to reverse or “release” an auto-accelerator mechanism to avoid cementing overly ambitious forward CI benchmarks in place if the market would struggle to comply and compromise the integrity of the program. As the CARB Governing Board has exercised with multiple regulations before, we would encourage the Governing Board direct CARB's Executive Officer to work with stakeholders and perform additional analysis and then return later for formal approval.

We encourage CARB to provide regular periodic review of the program's performance to assess what additional changes would be required and discussed through a formal rulemaking process where all stakeholders can participate.

WSPA appreciates the opportunity to provide comments on this important regulatory process. If

Dr. Cheryl Laskowski
June 6, 2023
Page 4

you have any questions regarding this submittal, please contact me at via email at tderivi@wspa.org.

Sincerely,

A handwritten signature in blue ink that reads "Tanya Derivi".

Senior Director, California Climate and Fuels



Tanya M. DeRivi

Senior Director, California Climate and Fuels

September 12, 2023

Dr. Cheryl Laskowski
Branch Chief – Low Carbon Fuel Standard
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: WSPA Comments on the Low Carbon Fuel Standard Modeling Updates Workshop

Dear Dr. Laskowski,

The Western States Petroleum Association (WSPA) appreciates the opportunity to provide these written comments on the California Air Resources Board's (CARB) August 16, 2023 public workshop regarding updates to the California Transportation Supply (CATS) Model used for the Low Carbon Fuel Standard (LCFS) program. WSPA is a trade association that represents companies that provide diverse sources of transportation energy throughout the west, including California. This includes the transport and marketing of petroleum, petroleum products, natural gas, renewable fuels, and other energy supplies.

Diesel Fuel Demand and Heavy-Duty Vehicle Zero Emission Vehicle (ZEV) Assumptions

While CARB has sought to update the CATS Model to account for the recent adoption of the Advanced Clean Fleets (ACF) regulation, WSPA appreciates the known transportation electrification-related uncertainties as identified in the 2022 Scoping Plan Update's "Uncertainty Analysis"¹ and the ACF regulation itself. These were recently discussed during CARB's new ACF "Truck Regulations Advisory Committee" on August 22, 2023 – where infrastructure challenges and vehicle readiness were amongst the priority issues identified by affected stakeholders that could affect compliance. We further note that the ACF regulation was only recently finalized and re-filed with the Office of Administrative Law for a final determination, so CARB has not yet submitted it to the U.S. Environmental Protection Agency for the required Clean Air Act waiver request that would make the regulation enforceable (if granted). Furthermore, we note that the North American Electric Reliability Corporation – the entity responsible for the reliable operation of our bulk power system – recently identified energy policy as the top risk – with grid transformation, resilience to extreme events, security risks, and critical infrastructure interdependencies falling behind – to the reliable operation of the Bulk Power System in their 2023 ERO Reliability Risk Priorities Report.² We again urge CARB to more closely evaluate what impact the large-scale shift of heavy-duty trucks would have on the energy demand of California's electric grid.

We would recommend that CARB not set LCFS benchmarks based on the presumed and wholly successful implementation of ACF given the significant known challenges identified to date and without also having an alternative pathway to ensure the reliable provision of necessary services to all Californians. Although CARB shows a 37% reduction of diesel fuel demand from 2022 to 2045 in the CATS Model updates, if medium- and heavy-duty ZEVs do not saturate the market as quickly as CARB assumes in staff's presentation (slides 17 and 18), likely resulting in prolonged and heightened demand for liquid fuels, transportation fuel companies will need a continuing means to comply with the LCFS regulation. We encourage CARB to conduct periodic reviews of

¹ Appendix J, <https://ww2.arb.ca.gov/sites/default/files/2022-11/2022-sp-appendix-j-uncertainty-analysis.pdf>

² https://www.nerc.com/comm/RISC/Related%20Files%20DL/RISC_ERO_Priorities_Report_2023_Board_Approved_Aug_17_2023.pdf

the program, accounting for the real world implementation status of ACF, Advanced Clean Trucks, the Omnibus regulation, and include a flexible compliance mechanism to make adjustments accordingly.

CATS Technical Documentation – CI Factor Assumptions

Table 11³ shows a significant reduction of the carbon intensity (CI) of the electric grid from 2044 to 2045 – from 48.3 (in 2044) to 16.5 (in 2045). WSPA seeks clarification from staff regarding the CI curve for the electricity grid, and confirmation that such a substantial CI reduction could take place in a single year.

WSPA appreciates the opportunity to provide comments on the CATS modeling updates. If you have any questions regarding this submittal, please contact me via email at tderivi@wspa.org.

Sincerely,



Tanya M. DeRivi
Senior Director, California Climate and Fuels

³ California Transportation Supply (CATS) Model v0.2 – Technical Documentation for August 2023 Example Scenario, Last Modified: August 2023 https://ww2.arb.ca.gov/sites/default/files/2023-08/CATS%20Technical_1.pdf



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May 10, 2024

Carolyn Lozo
Chief, Transportation Fuels Branch
California Air Resources Board
1001 "I" Street
Sacramento, CA 95814

Via electronic submission

Re: Proposed Low Carbon Fuel Standard Amendments

Transportation Fuels Branch Chief Lozo:

Thank you for the opportunity to comment in response to the California Air Resources Board's (CARB) public workshop on April 10, 2024. The National Oilseed Processors Association (NOPA) appreciates the opportunity to provide additional insights on the proposed amendments to the Low Carbon Fuel Standard (LCFS).

095.1 **Building upon our previous comments, NOPA supports CARB's additional analysis and remarks delivered at the workshop which recognize that consideration of a cap or limitation on crop-based oil feedstocks is unwarranted and would increase costs and fossil diesel use.**

095.2 **NOPA also appreciates CARB's acknowledgement that a more risk-based approach to sustainability certification is warranted. As noted in our previous comments, a targeted approach would streamline compliance requirements while ensuring that sustainability criteria are met. Recognizing biofuels produced in compliance with existing programs, such as the Renewable Fuel Standard (RFS), is a practical and effective way to achieve this goal.**

Background

Organized in 1930, NOPA represents the U.S. soybean, canola, flaxseed, safflower seed, and sunflower seed-crushing industries. NOPA's membership includes 15 members that are engaged in the processing of oilseeds for meal and oil that are utilized in the manufacturing of food, feed, renewable fuels, and industrial products. NOPA member companies operate a total of five softseed and 62 solvent extraction plants across 21 states. NOPA members crush approximately 95% of all soybeans processed in the U.S.

NOPA members' oilseed processing operations yield protein-rich meal for human and animal nutrition, as well as vegetable oil that is used as an ingredient in food manufacturing and as a feedstock for renewable fuels such as biodiesel, renewable diesel and sustainable aviation fuel (SAF). These sustainably produced biofuels help reduce carbon dioxide equivalent (CO₂e) greenhouse gas emissions and the carbon intensity of transportation fuels in use today. NOPA is uniquely qualified to respond to CARB's proposed sustainability criteria for crop-based biofuels given the number of markets that NOPA members serve, including the food, feed, fuel, and industrial markets.

CARB Should Continue to Oppose a Cap on Vegetable Oils

NOPA strongly supports CARB's findings that renewable diesel and biodiesel have a positive impact on both consumers and the environment. The data presented during the April workshop clearly underscores the importance of continuing to promote the use of these fuels as part of California's efforts to achieve its sustainability and air quality goals.

As CARB staff rightfully pointed out, biomass-based diesel (BBD) has displaced 60% of fossil diesel in California, reducing greenhouse gases, Particulate Matter (PM2.5) and Nitrous Oxide (NOx) emissions.

Placing a cap on crop-based feedstocks used to make BBD and other renewable fuels will simply increase:

- Fossil diesel use;
- Fuel costs;
- Carbon emissions;
- NOx emissions; and
- PM2.5 emissions.

095.3

Beyond increasing public health risks and driving up consumer costs, a cap on crop-based feedstocks can have far-reaching effects on investments many of those same companies have committed in dedicated energy crops like pennycress, camelina, carinata and winter canola; and climate smart agricultural practices. Taken together, these investments represent a new wave in renewable energy production – based on the promise of a market which rewards sustainability and carbon reduction – not artificial caps which would stymie innovation.

As CARB staff pointed out during the workshop, we cannot wait for full electrification. Internal combustion engines – particularly in the heavy-duty sector – will be on our roads for decades to come. California should take advantage of a low carbon fuel that is being produced today at scale. NOPA urges CARB to maintain its opposition to imposing a cap on vegetable oil feedstocks. Such a measure could hinder the development and adoption of renewable fuels and limit the availability of low-carbon options for consumers. We recommend implementing policies that encourage the responsible production and use of renewable feedstocks while addressing concerns about deforestation through targeted risk-based measures.

095.4

CARB Should Take a Targeted Risk-Based Approach to Sustainability Requirements

As CARB presented at the April workshop, a majority of BBD is already produced from waste feedstocks. Non-waste feedstock carbon intensity modeling already includes direct and indirect land-use change values and CARB notes that existing modeling “may not be accurate for applicants sourcing feedstocks from outside 2015 analysis area.” To address this, CARB is considering assigning higher land use change values for high-risk feedstocks – but notably excludes U.S. soy and North American canola.

095.5

NOPA appreciates CARB's recognition that some regions carry a higher risk for deforestation. However, the proposed sustainability requirements take a one-size-fits-all approach which would disadvantage regions of crop-based feedstock production with low-risk of deforestation (United States and Canada) at the expense of feedstocks produced in regions with a significantly higher risk of deforestation where segregated supply chains are more prevalent due to those risks.

095.6

As shown in Figures 1-3, the U.S. grain handling industry is a complex network of farmers, grain elevators, processors, traders and transportation systems that work together to produce, store, transport and distribute grains such as soy and canola as well as their associated products. It's a dynamic and interconnected system where over 300,000 farmers deliver their grains to more than 8,000 storage points efficiently and at a low cost. The U.S. grain network is unlike any other in the world where most countries have shorter supply chains and fewer delivery points.

Figure 1

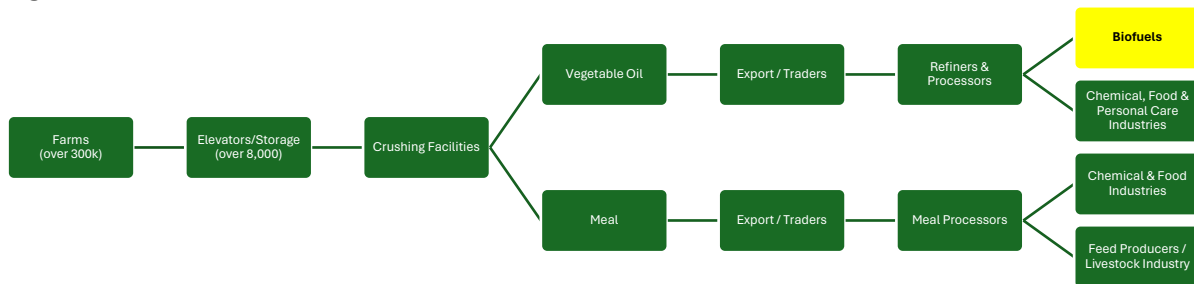


Figure 2

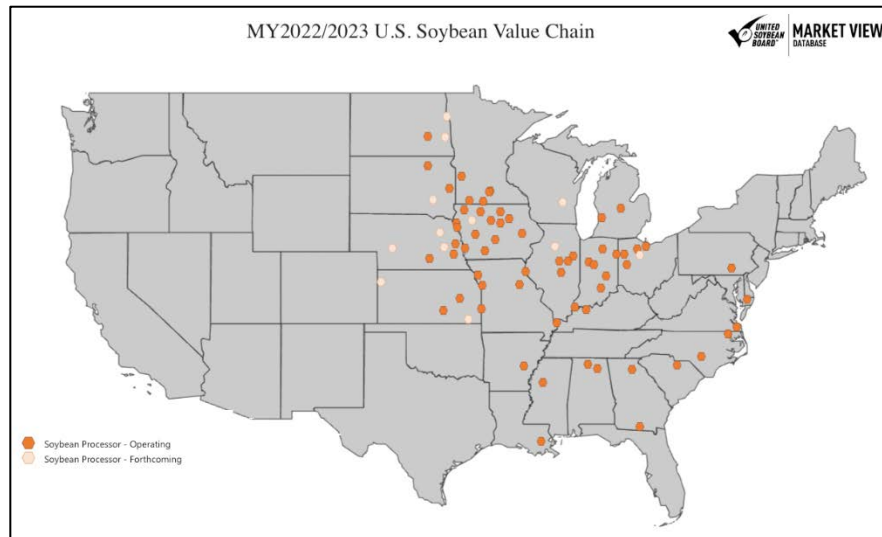
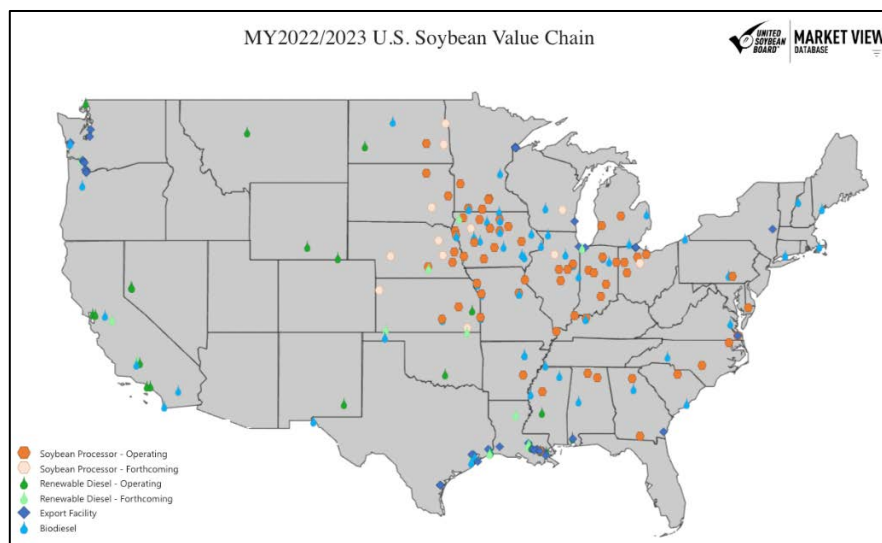


Figure 3



While biofuels represent one significant market for vegetable oil, they are by no means the sole destination for these products. Figure 1 demonstrates that vegetable oils are utilized in a wide array of industries, including food manufacturing, animal feed production, and industrial applications. Similarly, oilseed meal serves as a valuable protein source in livestock and poultry feed, contributing to global food security and nutrition.

095.7

Given the diverse end uses of vegetable oil and meal, oilseed processors must carefully evaluate the return on investment when considering participation in an expensive sustainability certification program like the one CARB is proposing. While California represents an important market for biofuels, it may constitute only a fraction of the overall market for oilseed products. In this context, the costs associated with obtaining and maintaining sustainability certifications may outweigh the benefits for many processors, particularly those with limited exposure to the California market.

095.8

For example, an oilseed processor located east of the Mississippi River is only likely to produce vegetable oil for the California LCFS market when market conditions warrant it. As a result, it may not make financial sense to establish and maintain a sustainability certification for one product at the facility when only a relatively small percentage of that vegetable oil would be used for biofuels in California. This could potentially limit the availability of low-risk, sustainable domestic feedstocks at the expense of higher-risk imported feedstocks.

Proposed Targeted Risk-Based Approach

NOPA would like to outline the following targeted risk-based approach for CARB to consider based on the risk associated with deforestation and the sustainability of crop-based feedstocks.

Low-Risk Regions

095.9

For regions identified as having the lowest risks of deforestation associated with crop-based feedstocks, such as the United States and Canada, crop-based feedstocks could be deemed to be in compliance with CARB's proposed sustainability criteria without the need for additional certification.

095.10

In the event CARB is unwilling to deem U.S. and Canadian feedstocks compliant, for regions where crop-based feedstocks comply with another established sustainability system, such as the Renewable Fuel Standard (RFS) or Canada's Clean Fuel Regulation (CFR), CARB could permit some level of aggregate compliance. This approach would streamline compliance requirements for feedstocks from regions with proven sustainability practices, aligning with existing regulatory frameworks while ensuring environmental integrity. As NOPA demonstrated in our previous comments (and included again here as Appendix A), the RFS meets each of CARB's proposed sustainability criteria. CARB could also recognize other domestic sustainability programs, such as the Soybean Sustainability Assurance Protocol (SSAP), as potential pathways for demonstrating compliance with its proposed criteria. These programs offer established frameworks for verifying sustainable practices and could complement existing regulatory efforts such as the RFS or CFR.

This approach would streamline compliance requirements while ensuring that sustainability criteria are met. Recognizing biofuels produced in compliance with existing programs, such as the RFS, is a practical and effective way to achieve this goal without sacrificing any sustainability gains.

Imported Feedstocks and High-Risk Regions or Regions with Insufficient Data

095.11

For imported feedstocks, including those in high-risk regions or regions where CARB has not adequately studied the deforestation risk associated with crop-based feedstocks, stricter measures could be applied. Feedstocks sourced from these regions would need to comply with CARB's proposed sustainability certification system, which may include certification processes to verify sustainable sourcing practices and efforts to mitigate deforestation risks.

095.12

This could include, as CARB noted at the April workshop, "additional detailed traceability, verification and/or enforcement of waste feedstocks to avoid fraud." NOPA noted in its prior comments that imports of Used Cooking Oil (UCO) have significantly increased since 2022 for LCFS compliance. NOPA appreciates CARB's recognition of these changing trade flows and continues to support CARB's proposed enhancement of traceability and enforcement of UCO imports to ensure the program is not being undermined by bad actors seeking to capitalize in the name of green energy. Such actions will ensure continued confidence and integrity in the LCFS program.

095.13

Implementing a targeted risk-based approach to sustainability criteria offers several advantages. It allows CARB to prioritize resources and regulatory efforts where they are most needed, ensures that sustainability criteria are effectively applied without imposing unnecessary burdens on low-risk regions or established sustainability programs, and ensures sufficient supplies of low-carbon fuels for the California market.

Indirect Land Use Change (iLUC)

In order to adequately assess risk, CARB needs to reassess its iLUC model, particularly regarding soybean oil, given the evolving data from models like Argonne GREET's Carbon Calculator for Land-Use and Land Management Change from Biofuels Production (CCLUB) Model. CARB staff have noted during previous workshops the particular scientific uncertainty surrounding the measurement of iLUC. Indeed, there is some inherent uncertainty in iLUC models, which assume direct relationships between agricultural production, economics, and land conversion. In reality, a wide range of factors affect land use decisions, including international and national policies, armed conflicts, technology disruptions, weather events, energy commodity prices, urbanization, development, and immigration/emigration trends.

095.14

Yet the iLUC values attributed to domestic crop-based feedstocks over time show a clear downward trend and convergence around a narrow range that is approximately *two to four times lower* than original estimates. CARB's most recent modeling of iLUC in 2015 for BBD of 29.1 gCO₂/MJ is significantly higher than the figures provided by updated models. This stark contrast raises questions about the accuracy and relevancy of CARB's current approach in estimating the emissions associated with BBD.

For example, the more recent findings from the 2023 R&D Argonne GREET Model with CCLUB and the 2024 40B SAF GREET model with CCLUB estimate an iLUC value of 12.5 and 12.2 gCO₂/MJ for soybean oil – a nearly 60% decrease from CARB's current value.

NOPA continues to encourage CARB to update its iLUC model with the latest science. This adjustment would not only ensure that CARB's regulations remain grounded in the latest science but also promote fairness and consistency within the industry. Additionally, CARB should maintain a flexible framework that allows for periodic reviews and updates to its iLUC model to incorporate emerging research and advancements in methodologies, ensuring that its regulations reflect the most accurate and up-to-date assessments of environmental impacts. By doing so, CARB can provide certainty to the marketplace and continue to play a leading role in driving sustainable practices and reducing carbon emissions in the transportation sector.

Conclusion

095.15 In conclusion, NOPA appreciates CARB's ongoing efforts to enhance the effectiveness and integrity of the LCFS. CARB analysis, market and scientific data collectively demonstrate that consideration of a cap or limitation on crop-based feedstocks is unwarranted. Further, doing so at this point would undercut the necessary investments that are being made to support low carbon feedstocks and further industry expansion.

NOPA also encourages CARB to consider adopting a targeted risk-based approach to implementing sustainability criteria under the LCFS. By accurately assessing deforestation risk, leveraging existing sustainability frameworks, and implementing targeted measures for high-risk regions, CARB can achieve its environmental objectives while also supporting a sustainable and resilient biofuels industry.

NOPA is eager to continue working with CARB to support the role of agriculture in diversifying the fuel supply through more sustainable feedstocks, thereby supporting cleaner fuel options in California and beyond. We appreciate this opportunity to comment and look forward to collaborating with CARB and other relevant stakeholders.

Sincerely,



Kailee Tkacz Buller
President & CEO
NOPA

Appendix A

RFS Compliance with CARB's Proposed Sustainability Criteria

Proposed Feedstock Sustainability Requirements	RFS Feedstock Sustainability Requirements
Must not be sourced on land forested after Jan. 1, 2008	Must not be sourced from agricultural land cleared or forested after Dec. 19, 2007
Maintain continuous certification	Maintain continuous certification
Certification system must be recognized by an international, national, or state/provincial government for at least 24 months.	The RFS was approved by the U.S. Congress on, and has been in effect since, Dec. 19, 2007
Certification system must consider environmental, social and economic criteria	Factors addressed by U.S. EPA during annual rulemakings to establish Renewable Volume Obligations (RVOs) under the RFS include: <ul style="list-style-type: none"> • Impact on the environment • Impact on cost to consumers and cost to transport goods, and job creation • Soil Quality • Environmental Justice
Certification system standard-setting process is participatory, and consensus driven – convening groups of economic, environmental and social stakeholders in both formal and informal manners; and creates a representative steering committee technical working group(s) and advisory group(s)	The passage of the RFS through Congress was by definition consensus driven, which allowed for the input by all stakeholders as afforded during the legislative process. EPA's annual rulemakings to establish RVOs allow for public comment by all stakeholders, both formal and informal. This process includes input from EPA's Clean Air Scientific Advisory Committee (CASAC) – an independent advisory group of non-EPA scientists, engineers, economists and social scientists.
The certification system must have clear, accessible, and transparent processes;	The development of the implementing regulations for the RFS and each subsequent rulemaking to establish RVOs went through a transparent and public comment process before finalization.
The certification system must publish procedures, guidance, certificates and audit report summaries on its website;	All RFS regulations, certificates, and compliance reports are available at https://www.epa.gov/renewable-fuel-standard-program
The certification system must be science based, provide clear targets to reach, and support demonstrable means of evaluation;	The development of the implementing regulations for the RFS and each subsequent rulemaking to establish RVOs by U.S. EPA go through a transparent and public comment process before finalization, based on specific scientific criteria and evaluation.
The certification system must demonstrate that requirements that are additional to the requirements of this subarticle are vetted via a	The passage of the RFS through Congress was by definition consensus driven, which allowed for the input by all stakeholders as afforded during the

multi-stakeholder process to mitigate potential stakeholder bias;	legislative process. EPA's annual rulemakings to establish RVOs also allow for public comment by all stakeholders, both formal and informal. This process includes input from EPA's Clean Air Scientific Advisory Committee (CASAC) – an independent advisory group of non-EPA scientists, engineers, economists and social scientists.
The certification system must maintain an effective auditor training program to ensure auditor competency;	The RFS compliance and audit program is maintained by U.S. EPA and can be found at https://www.epa.gov/renewable-fuel-standard-program/compliance-overview-renewable-fuel-standard-program
The certification system must include an effective grievance mechanism to ensure that problems are resolved;	EPA's annual rulemakings to establish RVOs also allow for public comment by all stakeholders, both formal and informal. A petition process is also afforded under the RFS, which has been utilized by stakeholders. https://www.epa.gov/renewable-fuel-standard-program/other-requests-under-renewable-fuel-standard
The certification system must include sanction mechanisms for participating feedstock suppliers and auditing bodies to ensure conformance with its system requirements; and	The RFS compliance and audit program is maintained by U.S. EPA and can be found at https://www.epa.gov/renewable-fuel-standard-program/compliance-overview-renewable-fuel-standard-program . The RFS and Clean Air Act also establish penalties for non-compliance.

May 10, 2024

Liane Randolph
Chair
California Air Resources Board
P.O. Box 2815
Sacramento, CA 95812
Via electronic submission

RE: Growth Energy Comments on April 10th LCFS Workshop

Chair Randolph:

Thank you for the opportunity to provide written comments regarding the proposed Low Carbon Fuel Standard (LCFS) amendments. Growth Energy is the world's largest association of biofuel producers, representing 97 U.S. plants that each year produce more than 9.5 billion gallons of renewable fuel; 119 businesses associated with the production process; and tens of thousands of biofuel supporters around the country. Together, we are working to bring better and more affordable choices at the fuel pump to consumers, improve air quality, and protect the environment for future generations. We remain committed to helping our country diversify our energy portfolio in order to grow more green energy jobs, decarbonize our nation's energy mix, sustain family farms, and drive down the costs of transportation fuels for consumers.

Growth Energy has previously submitted extensive comments demonstrating the vital role low carbon biofuels and higher biofuel blends can play in meeting California's ambitious climate goals. As we have previously noted, biofuels have been among the largest contributors to the success of the LCFS program to date and are poised to continue to do so with appropriate updates to the program.¹

096.1

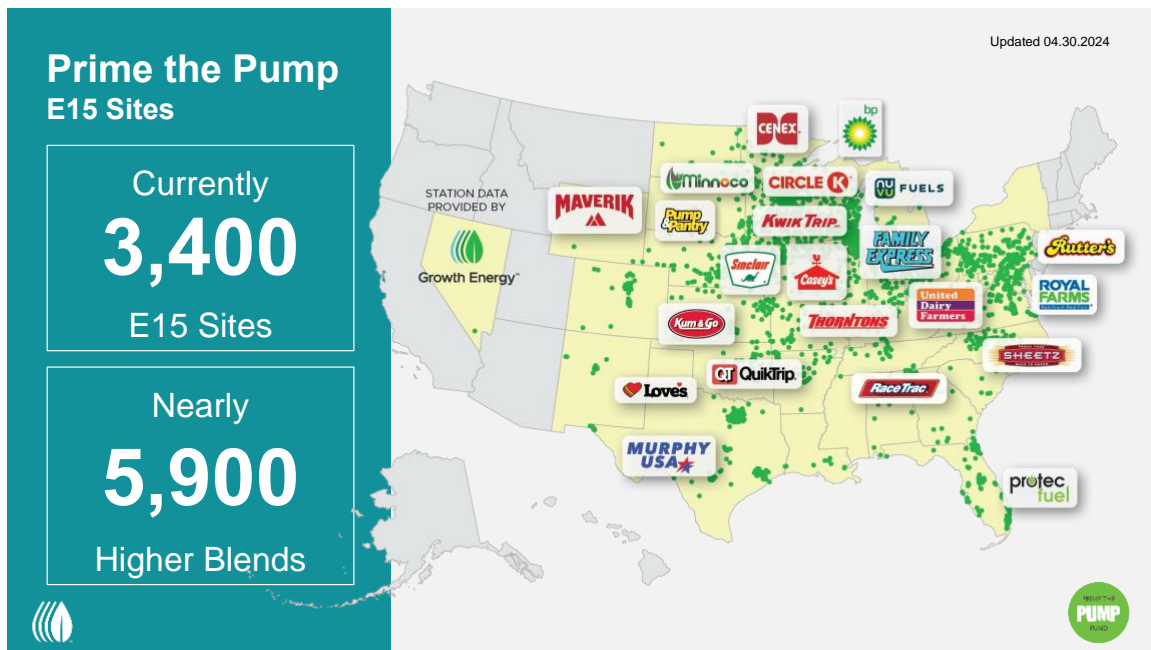
Approval of E15

We applaud the California Air Resources Board's consideration of the role E15 can play in reducing the state's greenhouse gas (GHG) emissions while also providing a cost-savings opportunity for California drivers.² Consumers have embraced E15's reputation as a more environmentally beneficial, more affordable fuel. Since the US EPA approved E15 in 2011, at which time there were zero retailers offering it, its availability rapidly expanded to now 3,400 retail sites in 32 states. Since then, drivers in America have relied on E15 to drive 100 billion miles.³

¹ https://www.transportationenergy.org/wp-content/uploads/2023/07/Decarbonizing-Combustion-Vehicles_FINAL.pdf

² <https://ww2.arb.ca.gov/sites/default/files/2024-04/LCFS%20April%20Workshop%20Slides.pdf>

³ <https://growthenergy.org/2024/01/29/100-billion-miles-e15-growth-energy/>



In contrast, with Nevada, Oregon, the Phoenix metro area, and most recently Montana approving E15 for sale, California remains the only state to have not approved this cost-effective, environmentally beneficial fuel that can be used in nearly all the state's 31 million gasoline-powered vehicles.⁴ If CARB not only approved E15, but replaced E10 with E15, this switch would be responsible for the GHG-reduction equivalent of removing more than 400,000 ICE vehicles from California's roads *without negatively impacting California drivers*.⁵ Neither will it have a negative impact on land use change for bioethanol.

096.2

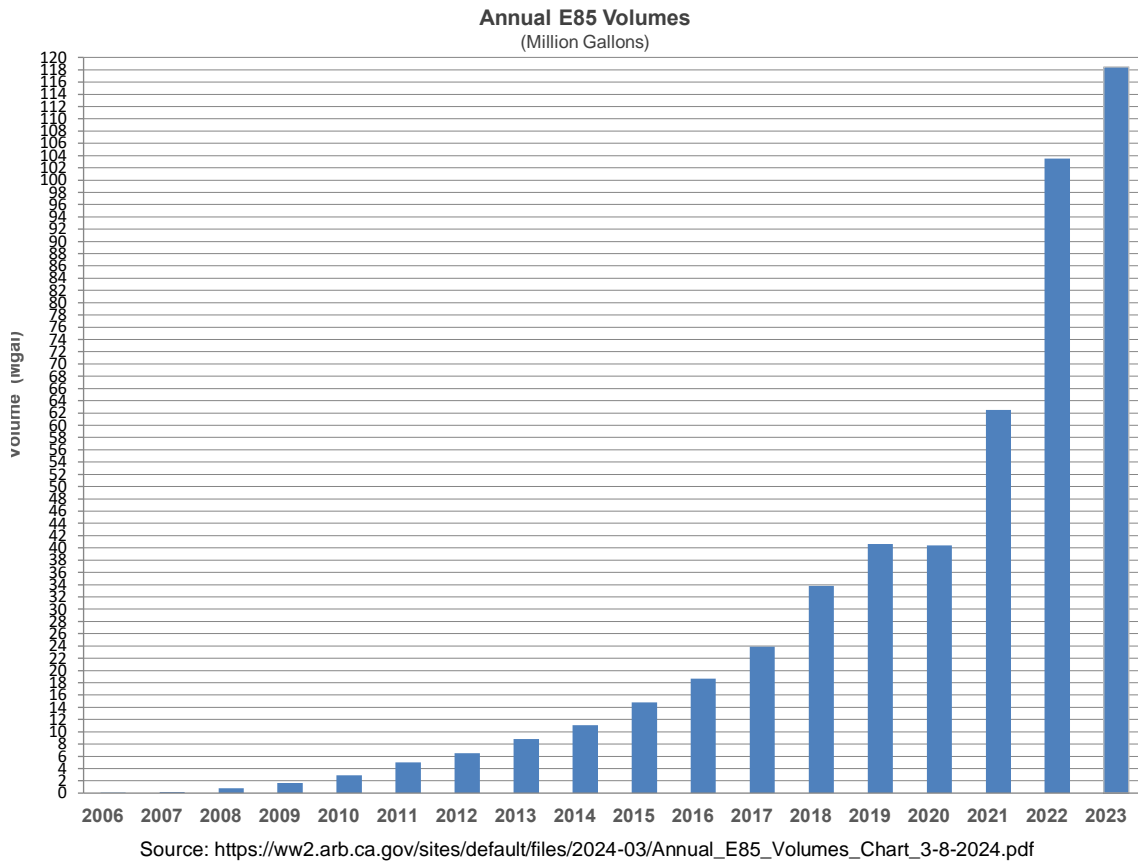
E85, Flex-Fuel Vehicles, and CCUS

Additionally, we appreciate CARB's August 2023 updates to the California Transportation Supply (CATS) Model that recognize the value of carbon capture utilization and sequestration (CCUS) in carbon reduction during bioethanol production. By accounting for CCUS, a process incentivized by the Inflation Reduction Act, the pathway carbon intensity (CI) for E85—approved for use in California—was updated such that it reduces the assumed CI score for bioethanol from 66 gCO₂e/MJ to 35 gCO₂e/MJ.⁶ We appreciate CARB's recognition of the bioethanol industry's efforts to further reduce carbon emissions via CCUS, a process which is incentivized by the Inflation Reduction Act of 2022. This is a welcome update to CATS and a recognition of the positive impact bioethanol has on California's emissions reduction goals.

⁴ <https://ethanolproducer.com/articles/montana-becomes-49th-state-to-approve-the-sale-of-e15>

⁵ <http://www.airimprovement.com/reports/national-e15-analysis-final.pdf>

⁶ [https://ww2.arb.ca.gov/sites/default/files/2023-08/CATS%20Technical 1.pdf](https://ww2.arb.ca.gov/sites/default/files/2023-08/CATS%20Technical%201.pdf)



096.6 Additionally, California's existing approval of E85 has resulted in significant growth of its use in flex-fuel vehicles (FFVs): more than 118 million gallons have been sold at 375 locations across the state in 2023 alone.⁷ Additionally, the current size of California's FFV fleet stands at more than 1.3 million vehicles.⁸ The use of E85 will promote even greater reductions in GHG emissions and reductions of air toxics. We would continue to encourage CARB to implement policies that strongly incentivize and as necessary, require the production and use of flex-fuel vehicles, as well as continued investment in infrastructure for expanded access to E85 in the state. In doing so, the Board will be achieving multiple goals: improving air quality and GHG emissions, reducing the state's dependence on fossil fuels, and providing consumers with an affordable choice to power their vehicles. Again, this can be done without any negative land conversion impact.

096.3 **Continued Concerns Over Proposed Sustainability Certification**

In our comments on the 45-day proposal released on December 19th, 2023, we raised multiple concerns regarding the proposed sustainability certification requirements for **crop-based biofuels**. Unfortunately, further information provided by CARB in the April 10th, 2024 workshop did little to alleviate our concerns. The proposal's sustainability

⁷ https://ww2.arb.ca.gov/sites/default/files/2024-03/Annual_E85_Volumes_Chart_3-8-2024.pdf

⁸ <https://afdc.energy.gov/vehicle-registration?year=2022>

certification for crop-based fuels cites concerns regarding **land use change (LUC)** factors that are unfounded relative to corn starch bioethanol. In fact, the United States is planting grain corn on roughly the same number of acres as was planted in 1900.⁹ At the same time, the per acre yield has increased more than 600%.¹⁰

Additionally, the LUC concern is already addressed in the LCFS's CI modeling. Corn starch bioethanol is given an automatic 19.8 gCO₂e/MJ penalty for indirect land use change (ILUC).¹¹ Adding the proposed sustainability criteria to the current ILUC score amounts to an unfair double penalty for corn starch bioethanol. We also believe the 19.8 gCO₂e/MJ score is outdated and not based on the most up to date research. A review of more recent science indicates a decreasing trend in land use values with the newer data indicating values closer to 4 gCO₂e/MJ.¹²

Further, the details provided in the April 10 workshop will add onerous and costly requirements on biofuel producers and farmers. Yet CARB's economic analysis of the proposal does not discuss the sustainability requirement's financial burden of implementation. Nor will the requirement allow bioethanol producers to use important tools like climate-smart agricultural practices for CI reduction. Some of these practices include precision application of fertilizer, use of low CI fertilizer, no or low-till farming practices, and the use of cover crops.¹³ The use of these practices for measured carbon reduction is not new. Other state agencies are using some of these same practices to reduce the release of soil carbon in the state's natural and working lands.¹⁴

Finally, with respect to the proposed sustainability audit, the proposal's audit requirements address issues that, while important to environmental and social justice, fall outside the scope of the LCFS. The proposed sustainability audit process would require auditors to conduct: "review of management systems", "review of social practices", and an assessment of the "economic sustainability of the applicant." These items have no bearing on GHG reduction. Additionally, many aspects of these audit provisions are addressed by federal programs. The Fair Labor Standards Act has clear employment guidelines specifically for the agriculture industry.¹⁵ Furthermore, if the proposal is adopted, crop-based biofuels would be the only feedstock for which these criteria would be audited.

⁹ https://www.nass.usda.gov/Publications/Todays_Reports/reports/croptr19.pdf,
https://www.nass.usda.gov/Charts_and_Maps/Field_Crops/cornac.php

¹⁰ <https://www.agry.purdue.edu/ext/corn/news/timeless/YieldTrends.html>

¹¹ https://ww3.arb.ca.gov/fuels/lcfs/iluc_assessment/iluc_analysis.pdf

¹² <https://iopscience.iop.org/article/10.1088/1748-9326/abde08/pdf>

¹³ <https://growthenergy.org/policy-priority/climate-smart-agriculture/>

¹⁴ <https://www.gov.ca.gov/2020/10/07/governor-newsom-launches-innovative-strategies-to-use-california-land-to-fight-climate-change-protect-biodiversity-and-boost-climate-resilience/>

¹⁵ <https://www.dol.gov/agencies/whd/agriculture/flsa>

096.4 **Expand Access to Low-CI Power Sourcing for Biofuels Producers**

With respect to Low-CI power sourcing, the proposal fails to recognize the carbon-reduction potential in crediting Low-CI power sourcing in biofuels production. The proposal currently only allows this mechanism for hydrogen. Firstly, the proposal fails the LCFS' fundamental policy goal of carbon intensity reduction in transportation fuels used in California. Allowing bioethanol producers to source *new* contracted low-CI power that is not included in a utility resource plan via a power purchase agreement does not impact electricity demand.

Secondly, biofuels production occurs largely in electricity markets outside of California. This renders the argument against expanding low-CI power sourcing due to purported resource shuffling moot. Additionally, by not expanding this provision to biofuels, it denies the state the opportunity to lead other jurisdictions towards increasing their low-CI power generation capability.

096.5 **Accelerate the Use of Sustainable Aviation Fuel (SAF)**

As producers of one of the most scalable feedstocks for SAF production, we appreciate the Board's attention to development of this key market through its proposal to remove the exemption for intrastate jet fuel. We encourage CARB to continue to work with SAF producers, biofuel feedstock producers, and airlines to continue to seek ways to accelerate use of these important fuels to help decarbonize the aviation sector.

Thank you for the opportunity to provide input on the April 10th, 2024 workshop. The LCFS Program is a critical tool to addressing climate change, and we look forward to working with CARB to ensure the role of biofuels in making California's fuel mix more sustainable and help the state achieve its progressive climate goals through the expanded use of bioethanol.

Sincerely,



Christopher P. Bliley
Senior Vice President of Regulatory Affairs
Growth Energy



1310 L Street NW Suite 375 • Washington DC 20005
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nopa@nopa.org • www.nopa.org

May 10, 2024

Carolyn Lozo
Chief, Transportation Fuels Branch
California Air Resources Board
1001 "I" Street
Sacramento, CA 95814

Via electronic submission

Re: Proposed Low Carbon Fuel Standard Amendments

Transportation Fuels Branch Chief Lozo:

Thank you for the opportunity to comment in response to the California Air Resources Board's (CARB) public workshop on April 10, 2024. The National Oilseed Processors Association (NOPA) appreciates the opportunity to provide additional insights on the proposed amendments to the Low Carbon Fuel Standard (LCFS).

Building upon our previous comments, NOPA supports CARB's additional analysis and remarks delivered at the workshop which recognize that consideration of a cap or limitation on crop-based oil feedstocks is unwarranted and would increase costs and fossil diesel use.

NOPA also appreciates CARB's acknowledgement that a more risk-based approach to sustainability certification is warranted. As noted in our previous comments, a targeted approach would streamline compliance requirements while ensuring that sustainability criteria are met. Recognizing biofuels produced in compliance with existing programs, such as the Renewable Fuel Standard (RFS), is a practical and effective way to achieve this goal.

Background

Organized in 1930, NOPA represents the U.S. soybean, canola, flaxseed, safflower seed, and sunflower seed-crushing industries. NOPA's membership includes 15 members that are engaged in the processing of oilseeds for meal and oil that are utilized in the manufacturing of food, feed, renewable fuels, and industrial products. NOPA member companies operate a total of five softseed and 62 solvent extraction plants across 21 states. NOPA members crush approximately 95% of all soybeans processed in the U.S.

NOPA members' oilseed processing operations yield protein-rich meal for human and animal nutrition, as well as vegetable oil that is used as an ingredient in food manufacturing and as a feedstock for renewable fuels such as biodiesel, renewable diesel and sustainable aviation fuel (SAF). These sustainably produced biofuels help reduce carbon dioxide equivalent (CO₂e) greenhouse gas emissions and the carbon intensity of transportation fuels in use today. NOPA is uniquely qualified to respond to CARB's proposed sustainability criteria for crop-based biofuels given the number of markets that NOPA members serve, including the food, feed, fuel, and industrial markets.

CARB Should Continue to Oppose a Cap on Vegetable Oils

NOPA strongly supports CARB's findings that renewable diesel and biodiesel have a positive impact on both consumers and the environment. The data presented during the April workshop clearly underscores the importance of continuing to promote the use of these fuels as part of California's efforts to achieve its sustainability and air quality goals.

As CARB staff rightfully pointed out, biomass-based diesel (BBD) has displaced 60% of fossil diesel in California, reducing greenhouse gases, Particulate Matter (PM2.5) and Nitrous Oxide (NOx) emissions.

Placing a cap on crop-based feedstocks used to make BBD and other renewable fuels will simply increase:

- Fossil diesel use;
- Fuel costs;
- Carbon emissions;
- NOx emissions; and
- PM2.5 emissions.

Beyond increasing public health risks and driving up consumer costs, a cap on crop-based feedstocks can have far-reaching effects on investments many of those same companies have committed in dedicated energy crops like pennycress, camelina, carinata and winter canola; and climate smart agricultural practices. Taken together, these investments represent a new wave in renewable energy production – based on the promise of a market which rewards sustainability and carbon reduction – not artificial caps which would stymie innovation.

As CARB staff pointed out during the workshop, we cannot wait for full electrification. Internal combustion engines – particularly in the heavy-duty sector – will be on our roads for decades to come. California should take advantage of a low carbon fuel that is being produced today at scale. NOPA urges CARB to maintain its opposition to imposing a cap on vegetable oil feedstocks. Such a measure could hinder the development and adoption of renewable fuels and limit the availability of low-carbon options for consumers. We recommend implementing policies that encourage the responsible production and use of renewable feedstocks while addressing concerns about deforestation through targeted risk-based measures.

CARB Should Take a Targeted Risk-Based Approach to Sustainability Requirements

As CARB presented at the April workshop, a majority of BBD is already produced from waste feedstocks. Non-waste feedstock carbon intensity modeling already includes direct and indirect land-use change values and CARB notes that existing modeling “may not be accurate for applicants sourcing feedstocks from outside 2015 analysis area.” To address this, CARB is considering assigning higher land use change values for high-risk feedstocks – but notably excludes U.S. soy and North American canola.

NOPA appreciates CARB's recognition that some regions carry a higher risk for deforestation. However, the proposed sustainability requirements take a one-size-fits-all approach which would disadvantage regions of crop-based feedstock production with low-risk of deforestation (United States and Canada) at the expense of feedstocks produced in regions with a significantly higher risk of deforestation where segregated supply chains are more prevalent due to those risks.

As shown in Figures 1-3, the U.S. grain handling industry is a complex network of farmers, grain elevators, processors, traders and transportation systems that work together to produce, store, transport and distribute grains such as soy and canola as well as their associated products. It's a dynamic and interconnected system where over 300,000 farmers deliver their grains to more than 8,000 storage points efficiently and at a low cost. The U.S. grain network is unlike any other in the world where most countries have shorter supply chains and fewer delivery points.

Figure 1

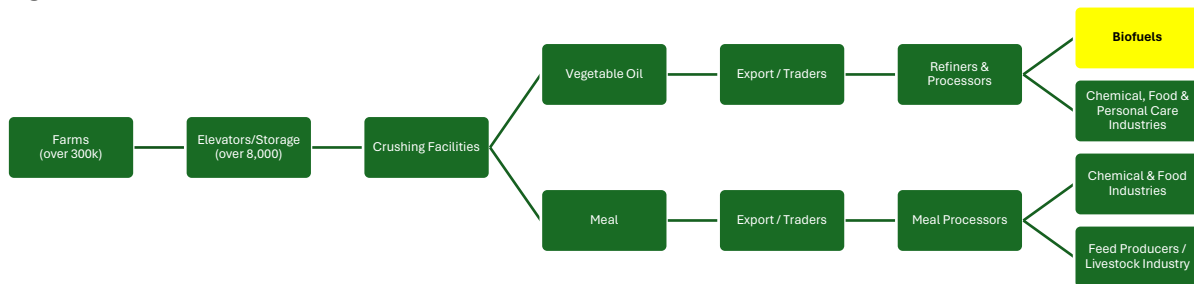


Figure 2

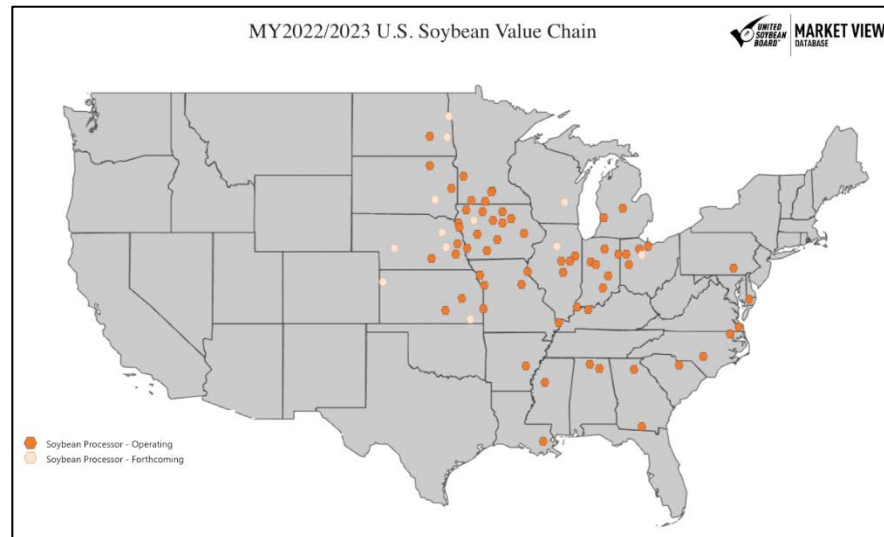
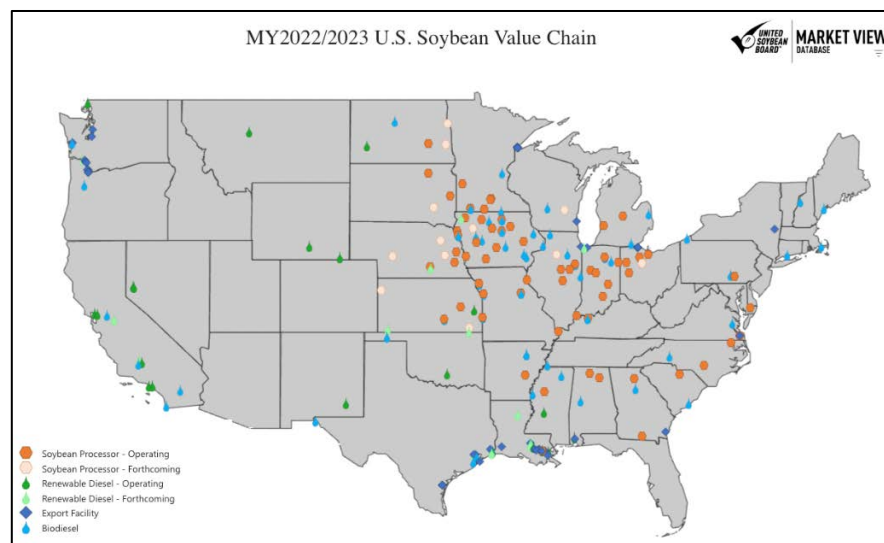


Figure 3



While biofuels represent one significant market for vegetable oil, they are by no means the sole destination for these products. Figure 1 demonstrates that vegetable oils are utilized in a wide array of industries, including food manufacturing, animal feed production, and industrial applications. Similarly, oilseed meal serves as a valuable protein source in livestock and poultry feed, contributing to global food security and nutrition.

Given the diverse end uses of vegetable oil and meal, oilseed processors must carefully evaluate the return on investment when considering participation in an expensive sustainability certification program like the one CARB is proposing. While California represents an important market for biofuels, it may constitute only a fraction of the overall market for oilseed products. In this context, the costs associated with obtaining and maintaining sustainability certifications may outweigh the benefits for many processors, particularly those with limited exposure to the California market.

For example, an oilseed processor located east of the Mississippi River is only likely to produce vegetable oil for the California LCFS market when market conditions warrant it. As a result, it may not make financial sense to establish and maintain a sustainability certification for one product at the facility when only a relatively small percentage of that vegetable oil would be used for biofuels in California. This could potentially limit the availability of low-risk, sustainable domestic feedstocks at the expense of higher-risk imported feedstocks.

Proposed Targeted Risk-Based Approach

NOPA would like to outline the following targeted risk-based approach for CARB to consider based on the risk associated with deforestation and the sustainability of crop-based feedstocks.

Low-Risk Regions

For regions identified as having the lowest risks of deforestation associated with crop-based feedstocks, such as the United States and Canada, crop-based feedstocks could be deemed to be in compliance with CARB's proposed sustainability criteria without the need for additional certification.

In the event CARB is unwilling to deem U.S. and Canadian feedstocks compliant, for regions where crop-based feedstocks comply with another established sustainability system, such as the Renewable Fuel Standard (RFS) or Canada's Clean Fuel Regulation (CFR), CARB could permit some level of aggregate compliance. This approach would streamline compliance requirements for feedstocks from regions with proven sustainability practices, aligning with existing regulatory frameworks while ensuring environmental integrity. As NOPA demonstrated in our previous comments (and included again here as Appendix A), the RFS meets each of CARB's proposed sustainability criteria. CARB could also recognize other domestic sustainability programs, such as the Soybean Sustainability Assurance Protocol (SSAP), as potential pathways for demonstrating compliance with its proposed criteria. These programs offer established frameworks for verifying sustainable practices and could complement existing regulatory efforts such as the RFS or CFR.

This approach would streamline compliance requirements while ensuring that sustainability criteria are met. Recognizing biofuels produced in compliance with existing programs, such as the RFS, is a practical and effective way to achieve this goal without sacrificing any sustainability gains.

Imported Feedstocks and High-Risk Regions or Regions with Insufficient Data

For imported feedstocks, including those in high-risk regions or regions where CARB has not adequately studied the deforestation risk associated with crop-based feedstocks, stricter measures could be applied. Feedstocks sourced from these regions would need to comply with CARB's proposed sustainability certification system, which may include certification processes to verify sustainable sourcing practices and efforts to mitigate deforestation risks.

This could include, as CARB noted at the April workshop, “additional detailed traceability, verification and/or enforcement of waste feedstocks to avoid fraud.” NOPA noted in its prior comments that imports of Used Cooking Oil (UCO) have significantly increased since 2022 for LCFS compliance. NOPA appreciates CARB's recognition of these changing trade flows and continues to support CARB's proposed enhancement of traceability and enforcement of UCO imports to ensure the program is not being undermined by bad actors seeking to capitalize in the name of green energy. Such actions will ensure continued confidence and integrity in the LCFS program.

Implementing a targeted risk-based approach to sustainability criteria offers several advantages. It allows CARB to prioritize resources and regulatory efforts where they are most needed, ensures that sustainability criteria are effectively applied without imposing unnecessary burdens on low-risk regions or established sustainability programs, and ensures sufficient supplies of low-carbon fuels for the California market.

Indirect Land Use Change (iLUC)

In order to adequately assess risk, CARB needs to reassess its iLUC model, particularly regarding soybean oil, given the evolving data from models like Argonne GREET's Carbon Calculator for Land-Use and Land Management Change from Biofuels Production (CCLUB) Model. CARB staff have noted during previous workshops the particular scientific uncertainty surrounding the measurement of iLUC. Indeed, there is some inherent uncertainty in iLUC models, which assume direct relationships between agricultural production, economics, and land conversion. In reality, a wide range of factors affect land use decisions, including international and national policies, armed conflicts, technology disruptions, weather events, energy commodity prices, urbanization, development, and immigration/emigration trends.

Yet the iLUC values attributed to domestic crop-based feedstocks over time show a clear downward trend and convergence around a narrow range that is approximately *two to four times lower* than original estimates. CARB's most recent modeling of iLUC in 2015 for BBD of 29.1 gCO₂/MJ is significantly higher than the figures provided by updated models. This stark contrast raises questions about the accuracy and relevancy of CARB's current approach in estimating the emissions associated with BBD.

For example, the more recent findings from the 2023 R&D Argonne GREET Model with CCLUB and the 2024 40B SAF GREET model with CCLUB estimate an iLUC value of 12.5 and 12.2 gCO₂/MJ for soybean oil – a nearly 60% decrease from CARB's current value.

NOPA continues to encourage CARB to update its iLUC model with the latest science. This adjustment would not only ensure that CARB's regulations remain grounded in the latest science but also promote fairness and consistency within the industry. Additionally, CARB should maintain a flexible framework that allows for periodic reviews and updates to its iLUC model to incorporate emerging research and advancements in methodologies, ensuring that its regulations reflect the most accurate and up-to-date assessments of environmental impacts. By doing so, CARB can provide certainty to the marketplace and continue to play a leading role in driving sustainable practices and reducing carbon emissions in the transportation sector.


Conclusion

In conclusion, NOPA appreciates CARB's ongoing efforts to enhance the effectiveness and integrity of the LCFS. CARB analysis, market and scientific data collectively demonstrate that consideration of a cap or limitation on crop-based feedstocks is unwarranted. Further, doing so at this point would undercut the necessary investments that are being made to support low carbon feedstocks and further industry expansion.

NOPA also encourages CARB to consider adopting a targeted risk-based approach to implementing sustainability criteria under the LCFS. By accurately assessing deforestation risk, leveraging existing sustainability frameworks, and implementing targeted measures for high-risk regions, CARB can achieve its environmental objectives while also supporting a sustainable and resilient biofuels industry.

NOPA is eager to continue working with CARB to support the role of agriculture in diversifying the fuel supply through more sustainable feedstocks, thereby supporting cleaner fuel options in California and beyond. We appreciate this opportunity to comment and look forward to collaborating with CARB and other relevant stakeholders.

Sincerely,

A handwritten signature in blue ink that reads "Kailee Tkacz Buller". The signature is fluid and cursive, with the first name "Kailee" being more prominent.

Kailee Tkacz Buller
President & CEO
NOPA

Appendix A

RFS Compliance with CARB's Proposed Sustainability Criteria

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Certification system standard-setting process is participatory, and consensus driven – convening groups of economic, environmental and social stakeholders in both formal and informal manners; and creates a representative steering committee technical working group(s) and advisory group(s)	The passage of the RFS through Congress was by definition consensus driven, which allowed for the input by all stakeholders as afforded during the legislative process. EPA's annual rulemakings to establish RVOs allow for public comment by all stakeholders, both formal and informal. This process includes input from EPA's Clean Air Scientific Advisory Committee (CASAC) – an independent advisory group of non-EPA scientists, engineers, economists and social scientists.
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The certification system must be science based, provide clear targets to reach, and support demonstrable means of evaluation;	The development of the implementing regulations for the RFS and each subsequent rulemaking to establish RVOs by U.S. EPA go through a transparent and public comment process before finalization, based on specific scientific criteria and evaluation.
The certification system must demonstrate that requirements that are additional to the requirements of this subarticle are vetted via a	The passage of the RFS through Congress was by definition consensus driven, which allowed for the input by all stakeholders as afforded during the

multi-stakeholder process to mitigate potential stakeholder bias;	legislative process. EPA's annual rulemakings to establish RVOs also allow for public comment by all stakeholders, both formal and informal. This process includes input from EPA's Clean Air Scientific Advisory Committee (CASAC) – an independent advisory group of non-EPA scientists, engineers, economists and social scientists.
The certification system must maintain an effective auditor training program to ensure auditor competency;	The RFS compliance and audit program is maintained by U.S. EPA and can be found at https://www.epa.gov/renewable-fuel-standard-program/compliance-overview-renewable-fuel-standard-program
The certification system must include an effective grievance mechanism to ensure that problems are resolved;	EPA's annual rulemakings to establish RVOs also allow for public comment by all stakeholders, both formal and informal. A petition process is also afforded under the RFS, which has been utilized by stakeholders. https://www.epa.gov/renewable-fuel-standard-program/other-requests-under-renewable-fuel-standard
The certification system must include sanction mechanisms for participating feedstock suppliers and auditing bodies to ensure conformance with its system requirements; and	The RFS compliance and audit program is maintained by U.S. EPA and can be found at https://www.epa.gov/renewable-fuel-standard-program/compliance-overview-renewable-fuel-standard-program . The RFS and Clean Air Act also establish penalties for non-compliance.

VIA ELECTRONIC FILING

May 10, 2024

Matthew Botill
California Air Resources Board
1001 I Street
Sacramento, California 95814



Re: RNG Coalition's Comments on Low Carbon Fuel Standard April 10, 2024, Workshop

Dear Mr. Botill:

The Coalition for Renewable Natural Gas (RNG Coalition) is a California-based nonprofit organization representing and providing public policy advocacy and education for the Renewable Natural Gas (RNG) industry.¹ RNG Coalition respectfully submits these comments to the California Air Resources Board (CARB) in response to the workshop held on April 10, 2024 (Workshop) on the Low Carbon Fuel Standard (LCFS).

- 098.1 Put simply, the LCFS framework works, and the availability of clean fuels incented by the LCFS is significantly exceeding expectations. The only barrier hobbling the program's continued success is the
- 098.2 regulatory delay in enhancing overall program ambition.

We applaud CARB for laying out a path to correct this delay at the Workshop and appropriately exploring how to enhance the program's goals. The CARB analysis presented at the Workshop and associated stakeholder dialog demonstrates that CARB should:

- 098.3
- **Adopt a 2025 "step down" in the LCFS program target of at least 9%** to immediately reduce the program's credit bank to an appropriate level. Of the proposed step down options presented at the Workshop, 9% provides the most certainty to rebalance the LCFS credit bank, which has long been the primary goal of this rulemaking.
- 098.4
- **Set midterm targets in the range of a 30-44% reduction by 2030.** This would better align GHG reductions from the transportation sector (the largest emitting sector of the California economy) with legislatively mandated goals for the entire economy.²
- 098.5
- **Allow the Automatic Accelerator Mechanism (AAM) to trigger as early as possible, and at a lower trigger level.** This will guard against the case where the near-term target step down is not sufficient to address the current oversupply. The AAM mechanism should be triggered when the credit bank is two time greater than quarterly deficits. If the AAM conditions are met, the corrective mechanism should be able to trigger as soon as possible (i.e., using the 2025 data).
- 098.6
- **Restore Clean Fuel Investor Confidence.** Although the Workshop did not focus on RNG topics, additional RNG changes are needed to restore confidence in LCFS as a tool for driving RNG

¹ For more information see: <http://www.rngcoalition.com/>

² CARB's primary Scoping Plan scenario targeted a 48% economy-wide reduction in greenhouse gases by 2030 and at least a 40% reduction is required by SB 32 (Pavley, 2016).

098.6 cont.

098.7

development. Our comments below reiterate the importance of a full credit true up and proper accounting to ensure methane emissions reductions from organic waste streams are recognized.

1 Increased Program Ambition is Critical for Continued RNG-Driven Methane Reduction and Growth in All Low Carbon Fuels

Given the LCFS credit surpluses over the last two years, a significant step-down in the Annual Carbon Intensity (CI) Benchmarks cannot be delayed any further.

Cumulatively through Q4 2023, 155.58 million metric tons (MT) of credits and 132.03 million MT deficits have been generated, for a net 23.55 million MT of banked credits.³ This “extra” climate benefit to the atmosphere produced by the LCFS—the banked credits above and beyond current goals—is currently approximately the same size as the annual emissions of the country of Honduras.⁴

098.8

This success should be celebrated, but changes to program ambition are critically needed if the trend in rapid clean fuel development is to continue in California. Based on all recent market information to date, 2024 will also contribute to the credit bank build significantly. Unless CARB acts swiftly to improve near-term targets, this will cause prices to fall further and RNG investment to fully stall.

The CARB modeling material released at the Workshop demonstrates that a near-term step down of at least 9% is feasible. This aligns with the work conducted by the consulting firm ICF, whose analysis we continue to support.⁵ ICF has extensive experience modeling supply and demand in analogous clean fuel programs, both for governments and non-governmental organizations. We encourage CARB to rely upon the results of the ICF analytical work as it represents the most comprehensive and realistic analysis of supply and economics of RNG available to the LCFS system, as well as for other low carbon fuels.

ICF recommends an optimal step down of 10.5% to 11.5% in 2025 and targeting a credit bank equivalent of 2-2.5 quarters worth of deficits.⁶ A step down of 9% should be easily reachable next year. The ICF work also demonstrates that greater ambition is achievable in the 2030 timeframe—2030 Targets in the range of 41-44% are recommended, which would better align with CARB’s primary Scoping Plan scenario targeting a 48% economy-wide reduction in greenhouse gases by 2030.⁷

Since transportation remains the largest sector of greenhouse gas (GHG) emissions in California, and additional deployment of a variety of low carbon fuel supply is clearly feasible, we believe CARB should move swiftly to increase the ambition of LCFS program targets and match the LCFS more closely to economy-wide goals.

³<https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/dashboard/quarterlysummary/Q4%202023%20Data%20Summary.pdf>

⁴ https://edgar.jrc.ec.europa.eu/report_2023#emissions_table

⁵ Throughout this rulemaking, a diverse group of Clean Fuel voices has contracted with ICF to independently prepare and submit an analysis of what program targets are feasible.

⁶ This is equivalent to a 2025 target of 24.25-25.25%.

⁷ <https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf>

098.9

The AAM provides an important insurance mechanism, should the step down be insufficient to rebalance the credit bank, but it is not a substitute for attempting to set targets to achieve the maximum technologically feasible and cost effective GHG reductions, as required by state law.⁸

2 Additional RNG-Related Changes Would Improve Investor Confidence and Increase the Pace of Methane Emissions Abatement

Despite CARB staff's stated support for RNG throughout the rulemaking process, investors remain concerned about how the Proposed Rule shifts the LCFS's RNG crediting framework. Although not discussed at the Workshop, we reiterate⁹ that:

098.10

- A routine, non-discretionary **credit true-up** from the temporary CI value to the certified provisional CI score (as well as adjustments up or down after each annual verification) remains necessary to properly recognize the true environmental performance of RNG pathways. We now have fully verified numbers demonstrating the actual GHG performance of each pathway annually. This is what LCFS crediting should be based on.

098.11

- The Proposed Rule's long term **deliverability requirements are unvetted and unproven** and therefore still problematic for RNG development. However, there is time to address this issue in future work. We encourage CARB staff to develop a dedicated public process (outside of this rulemaking) for increasing stakeholder understanding on this topic.

098.12

- A fixed-year phase-out of avoided methane crediting—as included in the Proposed Rule—is simply not smart policy. **Removing a “carrot” to reduce methane from sources such as dairies is unwise unless and until a “stick” has been developed.** Any mandatory rule must be able to meet the requirements of state law. If CARB wishes to continue to promote private investment in dairy RNG projects, any switch from incentives to direct requirements to install methane control systems must be more carefully managed. The current uncertainty over which regulatory tool will be used is preventing methane reduction projects from occurring.

098.13

- Even where existing appropriate regulatory requirements are in place, additional incentives are often needed to ensure greater amounts of methane capture. As such, **CARB should properly reflect the methane benefits of avoiding landfilling in the LCFS**, which would enhance the economic incentives and better motivate buildout of needed food/green waste digesters.

098.14

- At the Workshop CARB continued to state they'd like to see the biogas/RNG resource be shifted toward Zero Emission Vehicles (ZEVs) over time. Barriers can be removed through rule changes to help this occur. For example, **a temporary pathway for biogas to power should be established** and accounting frameworks should **allow RNG delivery to non-colocated power generation facilities.**

3 Conclusion

098.16

CARB has a narrowing window to provide clarity and investment certainty through additional changes to the Proposed Rule. More ambitious targets will allow the state to continue leveraging renewable gas

⁸ [CA Health & Safety Code § 38560](#)

⁹ See our February 20, 2024 comments on the Initial Statement of Reasons for more details.

098.16
cont. production to help reduce methane emissions, improve organic waste management, and decarbonize California's transportation sector.

098.17 The simple fact is that many RNG projects in planning and construction in California rely on LCFS revenues to be built and operated. At current LCFS prices, and in the face of the programmatic uncertainty created by this almost four years¹⁰ of discussion on this rulemaking, new RNG projects driven by the LCFS will be extremely limited until this rule is finalized. We thank CARB for your continued work and look forward to the swift conclusion of this LCFS rulemaking.

Sincerely,

/S/

Sam Wade
Director of Public Policy
Coalition for Renewable Natural Gas

¹⁰ We note that our comment letter on the October 2020 Workshop discussed many of these same topics, available here: <https://www.arb.ca.gov/lists/com-attach/48-lcfs-wkshp-oct20-ws-WmhRZ11tB2VVY1Vg.pdf>

May 10, 2024

SUBMITTED ELECTRONICALLY <https://ww2.arb.ca.gov/applications/public-comments>

Clerks' Office
California Air Resources Board
1001 I Street
Sacramento, California 95814

Subject: Low Carbon Fuel Standard – Light-Duty Vehicle Residential Base Credits

099.1 The Alliance for Automotive Innovation¹, Tesla, and Rivian (“Joint Automakers”) appreciate the opportunity to comment on the proposed changes to the Low Carbon Fuel Standard (LCFS).² Automakers have long supported the California LCFS; however, CARB is at risk of missing an opportunity to double-down on the regulation’s signature strengths in support of growing the light-duty (LD) electric vehicle (EV)³ market. Specifically, CARB should use the current rulemaking to reform and restore the LD Clean Fuel Reward (CFR) by giving automakers the opportunity to manage the reward program using proceeds from residential charging base credits. This represents the highest and best use of those credits, consistent with the foundational principles of the LCFS regulation and cognizant of the reality that LD EV sales now count on mainstream consumers. Sustained and broadly available purchase incentives for car buyers remain as important as ever for achieving California’s EV goals.

The Joint Automakers recommend reestablishing the CFR program as a point of purchase incentive. Less than four years ago, this program was established with unanimous support from automakers, utilities, and CARB to provide a point of purchase reward of up to \$1,500 for new EVs. The CFR was reduced to \$750 and then eliminated altogether on September 1, 2022. This program incentivized residential customers – *the very customers who generate the LCFS credits that fund this program* – to choose electricity rather than gasoline to fuel their vehicles. Moreover, the CFR was provided at the time of purchase, avoiding the weeks- or months-long wait associated with other rebate programs. It also provided an ongoing revenue stream, rather than dependency on the annual state budget allocation. Lastly, it was one of the few remaining

¹ From the manufacturers producing most vehicles sold in the U.S. to autonomous vehicle innovators to equipment suppliers, battery producers and semiconductor makers – Alliance for Automotive Innovation represents the full auto industry, a sector supporting 10 million American jobs and five percent of the economy. Active in Washington, D.C. and all 50 states, the association is committed to a cleaner, safer and smarter personal transportation future. www.autosinnovate.org.

² California Air Resources Board. (2024). Notice of Public Hearing to Consider Approving for Adoption the Proposed Low Carbon Fuel Standard Amendments. Retrieved January 26, 2024, from https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/lcfs_notice.pdf

³ Note: In these comments EV includes battery electric vehicles and plug-in electric vehicles.

financial incentives in California for LDVs. Its demise came at a time when EV sales were becoming more dependent on purchases by mainstream consumers. These consumers need more encouragement than early adopters to purchase an electric vehicle.

099.1 cont.

Additionally, no industry is investing more than automakers to develop the EV market. By 2030, the auto industry is expected to invest more than \$1.2 trillion globally⁴ in everything from critical minerals and critical mineral processing, to battery cell and pack production, to vehicle development, certification, and production, to charging stations and consumer education. Moreover, automakers are developing telematics, vehicle-to-home (V2H), and vehicle-to-grid (V2G) technologies that benefit the electric grid. Nonetheless, automakers are currently excluded from receiving any of the base residential charging credits generated by their investment.

The Joint Automakers continue to support CFR directed to LD EVs. However, rather than providing the LCFS credits to utilities, participating EV automakers and a third-party administrator approved by CARB (CFR Program Administrator) should administer the program and provide the EV Purchase reward. Automakers have decades of experience administering vehicle rebates and can do so far more efficiently than utilities. Indeed, utilities are sitting on credits worth over \$400 million⁵ that should have gone to CFR incentives. Automakers know more about their delivery and sales plans than anyone and can leverage that knowledge to better forecast CFR program expenses. Automakers also have direct access to the best data on home charging rates and can leverage that data to better forecast CFR program revenues.

099.2

To provide a stable and predictable EV incentive, CARB and automakers should set the CFR EV purchase reward annually based on estimated revenue from LCFS credit generation from

099.3

⁴ See <https://www.reuters.com/technology/exclusive-automakers-double-spending-evs-batteries-12-trillion-by-2030-2022-10-21/>. Retrieved May 7, 2024.

⁵ Estimation:

- 10,705,332 MT of base credits generated between 2019 and 2023
 - Source: <https://ww2.arb.ca.gov/resources/documents/low-carbon-fuel-standard-reporting-tool-quarterly-summaries>
- \$128.23 /MT weighted average price over that period
 - Source: <https://ww2.arb.ca.gov/resources/documents/lcfs-credit-transfer-activity-reports>
- = \$1,372,737,229 worth of base credit value generated
- 67% should have gone to CFR rewards
 - Source: page 32 of regulations: https://ww2.arb.ca.gov/sites/default/files/2020-07/2020_lcfs_fro_oal-approved_unofficial_06302020.pdf
- = \$919,733,944 should have gone to CFR rewards
- \$450,540,222 were the reported total program expenses (\$416.8 million in CFR rewards + \$33.7 million in administrative expenses)
 - Source: <https://cleanfuelreward.com/reporting#mark-equity>
- = **\$469,193,722 in underutilized money** through the end of 2023

099.3 residential EV charging. Unlike utilities that require minimum cash reserves (around \$10
cont. million) and thus needed to quickly change the CFR program, participating automakers could
continue the CFR throughout the year and then adjust the CFR reward in subsequent years.

099.4 The Joint Automakers commit to working with CARB and other stakeholders on setting the
minimum percentage of residential base EV charging credits that would be required to support
a resilient minimum CFR with the remainder dedicated to equity projects. While details would
still need to be worked out, the Joint Automakers recommend the following actions:

1. Split the residential base EV charging credits between equity projects and the automaker-managed CFR.
2. Put all CFR revenue towards light-duty vehicles.
3. Allocate base credits to participating automakers from their fleets sold starting January 1, 2025.
4. Put all EVs on the road before January 1, 2025 into a “community pool”. A third-party administrator would receive the base credits for those vehicles, sell the credits, and then add the revenue to the community pool. If any automaker had CFR outlay shortfall greater than their base credit revenue, the automaker would get a “make whole” payment from the community pool administrator.
5. Add the existing balance in the utility CFR program (estimated at over \$400 million) into the community pool.

Again, we sincerely appreciate the opportunity to work with CARB on proposed changes to the LCFS regulations.

Respectfully,

Dan Bowerson
Vice President
Alliance for Automotive Innovation

Joe Mendelson
Senior Counsel
Tesla

Tom Van Heeke
Senior Policy Advisor
Rivian

May 10, 2024

Attention:

Matthew Botill

Division Chief, Industrial Strategies Division

California Air Resources Board

1001 I Street

Sacramento, California 95814

Submitted electronically.

RE: California Low Carbon Fuel Standard Workshop – April 10, 2024

Dear Mr. Botill,

On behalf of the Canola Council of Canada (CCC) and Canadian Oilseed Processors Association (COPA) we welcome the opportunity to provide feedback on the *California Low Carbon Fuel Standard Workshop – April 10, 2024 (the Workshop)*.

The CCC and COPA are non-profit industry associations that work collaboratively to help address issues impacting the value chain and oilseed processing sector in Canada.

100.1 The canola industry in Canada appreciates CARB's analysis provided in *the Workshop* that further supports the that a cap on crop-based biofuel is unwarranted.

100.2 However, an important item missing from the analysis was information previously provided by the canola industry and other stakeholders that shows crop-based feedstock produced in Canada and the United States (U.S.) are sustainable. We reiterate our position that CARB adopt an approach in the updated rule that recognizes crop-based biofuels as meeting sustainability requirements on aggregate (in lieu of certification) if a jurisdiction can provide the necessary evidence to demonstrate there is no detrimental impact on land use change, including deforestation. This approach is consistent with existing biofuel programs, including the U.S. Renewable Fuel Standard and Canada's Clean Fuel Regulation, and has been proven to address sustainability concerns while limiting regulatory burden on market participants.

Please find below our detailed feedback on *the Workshop*.

I. Cap on Crop-based Biofuels

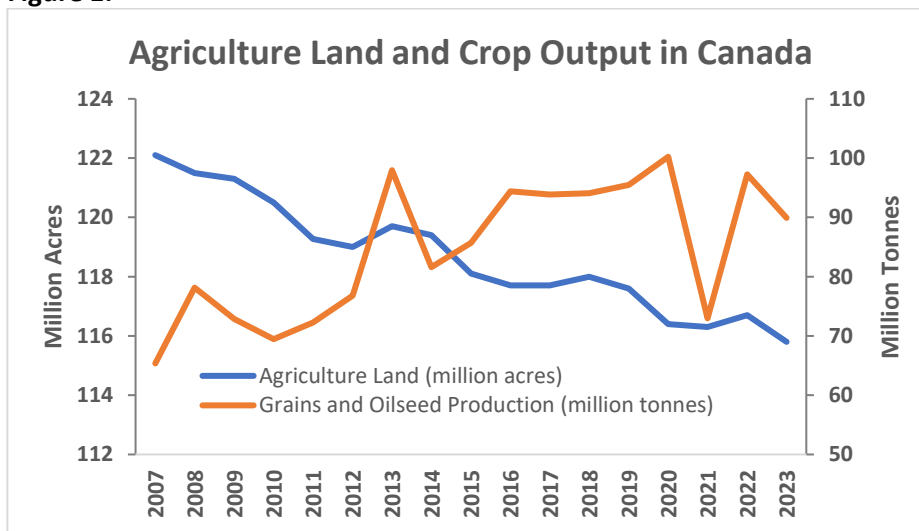
100.1 cont. The canola industry in Canada appreciates CARB's analysis provided in *the Workshop* that further supports a cap on crop-based biofuel is unwarranted. The data and examples presented during the *Workshop* clearly demonstrate the oilseed supply chain's ability to increase feedstock supplies through a combination of improved yields and investments in crush capacity, supporting demand for food, feed and fuel. We concur with CARB's analysis and reiterate the position that imposing a cap on vegetable oil feedstocks could hinder the development and adoption of renewable fuels and limit the availability of low-carbon options for consumers.

II. Sustainability Criteria

100.2
cont.

An important item missing from the analysis provided at *the Workshop* was information that shows crop-based feedstock produced in the U.S. and Canada are sustainable, with no detrimental impact on land use change, including deforestation. The data that the canola industry and other stakeholders shared in response to the *Proposed Amendments* released in December 2023, demonstrated that agriculture land in Canada and U.S. is shrinking, yet crop output continues to grow. Figure 1 is an example of this trend, clearly indicating that crops grown and harvested in Canada do not contribute to deforestation or any associated adverse land use impacts. Furthermore, growing more crops with less available land is a testament to the innovation of crop production, with farmers deploying enhanced plant genetics and applying sustainable growing practices.

Figure 1.



Source: Statistics Canada

We reiterate our position that CARB adopt an approach in the updated rule that would allow biofuels produced from crop-based feedstock to comply with sustainability requirements on aggregate in lieu of certification. While we respect the importance of sustainability criteria in the development of low carbon fuel markets, the certification requirements proposed appears to be a 'one size fits all' approach, placing unnecessary obligations and burden on the supply chain from jurisdictions like the U.S. and Canada that have already demonstrated crop production has no adverse impact on land use, deforestation, or biodiversity. Indeed, both the U.S. Renewable Fuel Standard and Canada's Clean Fuel Regulation already recognize crop production in U.S. and Canada as meeting sustainability requirements.

100.3

An aggregate approach to demonstrate compliance with sustainability requirements carries clear advantages for both CARB and market participants including:

1. It opens the door to a wider compliance option for CARB and allows for recognition of similar anti-deforestation efforts taken in partner jurisdictions (i.e. encourage efforts similar to U.S. and Canadian governments).
2. It encourages jurisdictions (not just individual entities) to demonstrate that their supply chains can and do meet sustainability criteria on key issues such as land clearance and deforestation.

100.3
cont.

3. Where sustainability equivalency can be demonstrated on aggregate across a jurisdiction, it will reduce the administrative burden and costs of feedstock supplies from those jurisdictions that are already fully meeting sustainability requirements under the rule.

III. Indirect Land Use Change

100.4

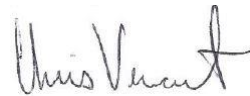
Similar to our comments above that a “one size fits all” approach to address sustainability requirements isn’t appropriate, any determination on ILUC must also take a nuanced approach, using best available science and data. In this regard, we appreciate that CARB intends to consider higher LUC values to high-risk crop-based feedstocks entering the LCFS.

On behalf of the CCC and COPA, we appreciate this opportunity to comment, and look forward to an ongoing dialogue with CARB and other relevant stakeholders to enact changes to the LCFS that will address climate change while creating economic opportunities for those in the low carbon fuel value chain.

Sincerely,



Chris Davison
President and CEO
CCC



Chris Vervaet
Executive Director
COPA



May 10, 2024

Matt Botill
Chief, Industrial Strategies Division
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: AMP AMERICAS COMMENTS ON APRIL 10, 2024 LOW CARBON FUEL STANDARD WORKSHOP

Dear Mr. Botill:

Thank you for the opportunity to comment on the April 10, 2024, Low Carbon Fuel Standard ("LCFS") Public Workshop. Amp Americas ("Amp") appreciates the California Air Resource Board's ("CARB's") leadership on addressing climate change and the significant success the LCFS program has had in decarbonizing transportation, as described by the benefits and outcomes highlighted in the workshop slides. Amp especially appreciates CARB staff's thorough and ongoing stakeholder engagement throughout the LCFS amendment process.

Amp strongly supports amending the LCFS quickly and in a manner that will ensure its ongoing success as a driver of investment in a broad array of low carbon fuels for California, including dairy methane capture projects. We appreciate your consideration of these comments.

ABOUT AMP

Founded in 2011, Amp develops, owns, and operates renewable natural gas ("RNG") facilities that convert dairy waste into carbon-negative renewable energy. Over our history, Amp's projects have prevented nearly 2 million metric tons of carbon equivalent emissions. In 2022 alone, our projects abated approximately 480,000 metric tons of carbon equivalent emissions, and we plan to rapidly expand our impact over the next several years.

As a pioneer in the dairy RNG industry, Amp registered the first 5 dairy RNG-to-CNG pathways in California's LCFS program, and we were the RNG supplier for the first 11 dairy RNG-to-hydrogen pathways. Our experience developing, operating, and reporting on these and other assets gives us a unique perspective on the impact CARB policy has on investment and project development activity related to low carbon fuels. Our projects and resulting methane and carbon dioxide reductions have been made possible by CARB's leadership in decarbonizing transportation, and we encourage CARB to continue to support the policy decisions that have made it so successful.

A STRONG, TECHNOLOGY NEUTRAL AND PERFORMANCE-BASED LCFS IS CRITICAL TO MEETING CALIFORNIA'S SLCP REDUCTION AND CARBON NEUTRALITY GOALS

To meet California's Short-Lived Climate Pollutant ("SLCP") reduction and carbon neutrality goals, it is imperative to maintain a robust LCFS that is technology-neutral and performance-based. Investments



101.2

supported by the LCFS are vital for developing dairy digesters and other projects that mitigate methane emissions. California's strategy of leveraging the LCFS to support methane mitigation projects, including at dairies, has proved tremendously successful, with hundreds of digesters now online and under development throughout the state and nationally.

Accordingly, we re-iterate our earlier comments regarding RNG-based pathways and other technical provisions of the program:¹

- 101.3 • We urge CARB to follow the deep and sound science and maintain avoided methane crediting for all RNG pathways.
- 101.4 • We support efforts to develop RNG pathways for zero emission vehicle ("ZEV") fuels and stationary sources, and encourage CARB to enable book-and-claim delivery for RNG-to-electricity to further support this transition.
- 101.5 • We support the proposed true-up provisions and recommend CARB allow true-ups during the Temporary CI period for any pathway using a Temporary CI.
- 101.6 • We endorse remote, less intensive verifications for all fuel transactions (not just electricity) to streamline processes and reduce costs.
- 101.7 • We support the proposed Calculation of Deficit Obligation for Verified CI Exceedance concept in Section 95486.1(g), but recommend applying this to the 2024 fuel transaction year, rather than starting in 2025.
- 101.8 • We strongly encourage maintaining the ability to report missing data provisions and force majeure events and associated emissions, especially from biological processes that cannot be easily controlled or mitigated in the event of unexpected outages of other equipment. We encourage keeping Section 95488.8(k) as currently exists in the current regulation.
- 101.9 • We encourage CARB to allow additional carbon capture, removal, utilization and sequestration ("CCRUS") protocols to be utilized as they are developed.

A NEAR-TERM STEP-DOWN OF GREATER THAN 9% IS NEEDED TO STRENGTHEN THE MARKET AND MAINTAIN THE PROGRAM AS A DRIVER OF INVESTMENT IN CLEAN FUELS PROJECTS

101.10

The ongoing development and operation of low carbon fuel projects, including dairy RNG projects, requires programs like the LCFS to provide and maintain a strong and clear market signal sufficient to attract capital for new projects and to maintain operations at existing RNG facilities. As indicated by the market response following the April 10, 2024 workshop (the price of credits fell from \$64.50 on April 9, 2024 to \$48.00 on May 8, 2024 according to Argus Air Daily), even the stronger near-term targets presented at the workshop are insufficient to return the market to balance and restore investor confidence.

In our previous comments,¹ we described how the bank of excess credits could reach about 38 million by the end of 2024, almost 6 times quarterly deficit generation. According to our analysis, a step-down to 25% in 2025, coupled with a stronger target of at least 35% in 2030, is necessary to correct for this projected level of surplus credits. Note that this would translate to a ~11% step down in 2025 – greater

¹ "Amp Americas' Comments on Proposed Low Carbon Fuel Standard Amendments," February 20, 2024. <https://www.arb.ca.gov/lists/com-attach/7007-lcfs2024-UjNdNIEgUI4CdAFz.pdf>



101.10
cont. than the scenarios presented at the workshop – and aligns with similar analysis and findings from ICF.² **We encourage CARB to continue evaluating appropriate step-downs, including levels greater than 9%,** in order return the market to conditions that will support ongoing investment towards California’s climate goals.

101.11 As a general rule, we strongly urge CARB to select targets – for 2025, 2030 and other dates through 2045 – that align with the State’s Scoping Plan and other climate targets, and avoid relying on the Auto Acceleration Mechanism (“AAM”) to “get it right” or correct for overly conservative targets. **We believe a step-down of greater than 9%, specifically 11%, stronger 2030 targets of at least 35% and a more responsive Auto Acceleration Mechanism (“AAM”), as described below, are necessary to fully align the program with the state’s climate change goals and return to the LCFS to a position where it is supporting additional low carbon fuels projects and volumes for California.**

TIME IS OF THE ESSENCE

We very much appreciate the diligent effort CARB staff, leadership, and the Board are putting into this rule-making process. Over the past 2 years, staff have hosted numerous workshops, heard from myriad stakeholders, and modeled countless scenarios. All this effort is critical to putting forth the best proposal to balance climate and market impact with affordability and other program goals.

101.12 At this point, however, we strongly urge CARB staff to put forth its best proposal and for the Board to vote on it as soon as possible. The longer this rulemaking delays, the more the program and low carbon fuels market suffers. A prompt vote on the LCFS rulemaking is critical to reinvigorating the market and maintaining California’s climate policy leadership.

RESPONSE TO QUESTIONS POSED AT THE WORKSHOP

We appreciate the thoughtful presentation at the workshop, and the specific questions posed. We offer the following responses to the questions on target setting.

- **Short-term vs long-term market conditions – how should staff approach the increased stringency need? Is it a onetime near-term need or do stakeholders anticipate rapid and sustained decarbonization progress through the next 10+ years?**

101.13 CARB certainly needs to prioritize strengthening the market in the near-term to remove the glut of excess credits. Until the massive credit bank is significantly reduced, it will prevent LCFS prices from recovering and will continue to send a signal not to invest in low carbon fuels for the California market. Setting targets that cause the bank to reduce will support immediate investment in additional low carbon fuels projects that are needed now to achieve the state’s near-, mid-, and long-term climate change goals.

² Based on its analysis, “ICF recommends a step down of 10.5% to 11.5% in 2025 to achieve a target credit bank equivalent of 2-3 quarters worth of deficits.” See pg. 1 of ICF comments at: <https://www.arb.ca.gov/lists/com-attach/7078-lcfs2024-VDVcNFlyVGsLdFQu.pdf>



101.14

It will be important to provide clear, on-going guidance to the market, as well, to support continued, ongoing investment in low carbon fuels – including low-carbon ZEV fuels – at the end of this decade and into the 2030s. At the moment, providing near- and mid-term certainty is far more important to guide the market through the next 5 years.

We think CARB has proposed an appropriate conceptual approach to support short-term and long-term market conditions through a near-term step down, strengthened 2030 targets, 2045 guidepost targets, and the addition of the AAM to account for uncertain market conditions. However, we urge strengthening the step-down to 11% and the 2030 target to at least 35%, while adjusting the AAM to make it more responsive to market conditions and align it with other commodity market practices.

- **Which approach can provide a smooth/sustained market signal to support deeper decarbonization in the 2030s?**

101.15

We believe a stronger 2030 target is critical to supporting near-term and ongoing investment in deeper decarbonization in the 2030s. Coupled with the AAM, we hope this structure provides a framework for maintaining conditions supportive of investment in deeper decarbonization on an ongoing basis. We also urge CARB to maintain and add elements that will support continued innovation and development of additional low carbon fuels, even as the state's vehicle fleet evolves. Among other items, these include:

- 101.16 ○ Maintaining avoided methane crediting and book-and-claim accounting for biogas-based pathways,
- 101.17 ○ Enabling additional fuel pathways, such as biogas-to-electricity and process energy for any fuel pathway,
- 101.18 ○ Supporting the widest array of CCRUS protocols possible, to support continued innovation and decarbonization of existing or new fuel pathways, and
- 101.19 ○ Allowing for on-farm innovations and other strategies to continually reduce the carbon intensity of new or existing pathways.

101.20

Finally, while we appreciate this may be beyond the scope of this rulemaking, we encourage CARB to consider expanding the LCFS to other transportation end uses and sectors. For biogas, in particular, expanding the LCFS to cover all gas end uses (e.g., industry, buildings, power, etc..) would provide the most equitable program and market signal to transition biogas from the transportation sector to stationary sources.

- **Should staff consider any changes to the trigger conditions for the AAM?**

101.21

Yes. As described in our previous letter,¹ we strongly support the addition of an AAM to the program, and encourage the following adjustments that would allow it to be more responsive to market conditions, without creating significant risks for the program:

- The **AAM should take effect as soon as the regulation does**, with the first test occurring in 2026 to evaluate 2025 performance.



101.21
cont.

- We strongly believe the **AAM trigger should be 1x quarterly deficits**, rather than 3x, in recognition that 1) the LCFS is now a liquid and mature market, and 2) that liquid and mature markets are in surplus conditions when inventory is greater than 0.6x quarterly demand. However, with the other changes mentioned here, we believe a 3x trigger is workable.
- There should be **no limit to applying the AAM in consecutive years**. The market can absorb this dynamic, and we see no reason to artificially limit the functioning of this important mechanism.

The AAM will help to strengthen the program and potentially help to avoid future market weakness driven by as-yet unforeseen trends in low carbon fuels supplies. These trends could include accelerated transportation electrification, widespread use of E15 or deployment of CCRUS, or any number of other factors. While the market is currently overachieving its targets, ironically, overachieving targets in the near term may lead to sustained price weakness, which would inevitably lead subsequently to low levels of investment and sustained periods of underachievement and high prices. If the market swings from undersupply to oversupply, prices will be volatile, undermining public confidence in the program and jeopardizing long term goals. An AAM can help provide a clear, ongoing signal that there will be a market for low carbon fuels, providing greater certainty to investors and incentivizing continuous investments in clean fuels and ongoing greater emissions reductions, provided that it is designed appropriately. It is important to get its design right and ensure it is sufficiently responsive to market conditions, in order to allow it to fulfill this crucial role.

Thank you again for the opportunity to comment on the April 10, 2024 workshop, and your ongoing collaboration with stakeholders through this public process. We appreciate your consideration of these comments and your work to amend and strengthen this critical program.

Sincerely,

Cassandra Farrant

Cassandra Farrant
Head of Environmental Credit Compliance
Amp Americas

May 10th, 2024

Matt Botill
Chief, Industrial Strategies Division
California Air Resources Board
1001 I Street, Sacramento, CA 95814

Mr. Botill and CARB Staff,

I am pleased to write on behalf of Generate Capital, PBC ("Generate") regarding the current rulemaking process to update and strengthen the Low Carbon Fuel Standard ("LCFS"). Generate is a leading sustainable infrastructure company based in San Francisco. Generate builds, owns, operates, and finances infrastructure solutions for clean energy, transportation, water, waste, agriculture, and smart cities. Founded in 2014, Generate partners with technology- and project-developers to deliver affordable, reliable, and sustainable resources to over 2,000 customers, companies, communities, school districts and universities.

Over the last several years, Generate has written many letters to CARB proposing or endorsing various policy elements of a revamped LCFS. We commend you and CARB Staff for consistently being open to feedback from a wide variety of stakeholders with – often strong – opinions of what an ideal LCFS program would look like. In this letter, we will continue to offer feedback on next steps, but the underlying emphasis of this letter should be unequivocal: **it is time to finalize this process**. The first meeting CARB hosted on potential changes to the LCFS program was in October 2020, when LCFS credits priced at \$195/MT and the credit bank was under 8 million; credits are currently \$48/MT and the credit bank has ballooned to 23 million. Pricing continues to fall as the market simply does not believe CARB will ever take action. Investment in projects has ceased. Operating projects are shuttering. It is time.

We urge CARB to finalize this rulemaking with a vote at the June or July board meeting.

As such, the areas we will offer our perspectives on in this letter are much more limited than in prior rounds of comments. This is a credit to CARB staff, who have sufficiently iterated on and refined the proposed changes to the point that what we are now discussing are largely technical matters. While there are other areas such as technology neutrality that are core to why we have invested in LCFS-linked projects, we feel as though we have offered our fully developed thoughts in prior commentary. The areas we will focus on in this letter include:

- The changes to the diesel baseline and its impact on credit supply and demand, and;
- The 2025 CI step-down and the 2030 CI target.

We would be happy to discuss these and other aspects of the LCFS program with CARB staff. We are committed to the ongoing success of the LCFS program, of California's Scoping Plan, and to the decarbonization of our economy at scale. Thank you for your hard work on these goals and towards California's continued leadership in the fight against climate change.

Sincerely,



Asher Goldman
Vice President
Generate Capital

CARB's solution to offset the increase in diesel's baseline CI value included a key flaw, making the solution inadequate to address the increase in the credit bank expected from this change; the CI reduction targets should be increased to fully counteract the change in the baseline

In our prior letter to CARB following the publication of the ISOR, we flagged that the increase to diesel's 2010 baseline effectively reduced the ambition of the LCFS program and would be expected to result in a larger credit bank, reduced credit pricing, and reduced investment in projects. At the April 10 Public Workshop, we were pleased to see that CARB moved to address this, incorporating offsetting changes to the CI scoring of biomass-based diesel products. In the presentation used during the workshop, CARB noted that "[a]n adjustment in the RD/BD CI scores to reflect the same change to both is included in the modeling". At the time, we had believed that the adjustment being incorporated by CARB would functionally increase the CI scores of these fuels by 4.78g/MJ, which would have been a satisfactory outcome.

102.2

Upon further review and discussion with other market participants, it has become apparent that this view was not entirely correct. The 4.78g/MJ increase applied to biomass-based diesel's CI scores had been calculated from the revised modeling of tailpipe emissions of methane, nitrous oxide, and carbon dioxide. Our understanding is that the increased carbon dioxide would not be counted here as it is considered biogenic. As a result, the actual applied change to biomass-based diesel fuels' CI scores would be just 2.74g/MJ.

This is material to the supply-demand balance in the LCFS market. Assuming no change in biomass-based diesel volumes from Q4 2023 (a bad assumption given the huge volumes of renewable diesel coming online in 2024), the change from a 4.78g/MJ adjustment to a 2.74g/MJ adjustment would yield an extra 650,000 MT of credit production in 2025; through 2040, this would be expected to be **worth 10M MT of incremental credit production**.

Throughout the rulemaking process, CARB staff has continually demonstrated a commitment to science-based reasoning underpinning each decision made. We applaud this; the fact-based approach allows investors like us to have confidence in CARB to oversee and administer this program in a consistent, level-headed manner. As such, we do not want CARB to adjust the CI scores of biomass-based diesel fuels any more than the rigorous modeling already performed suggests reflects the fuels' real-world lifecycle emissions. Instead, we would like to see CARB consider this mechanical increase in credit production (and corresponding relaxation of the LCFS's stringency) as you set the step-down magnitude. **Our estimate is that this change is equivalent to reducing the 2025 step-down by ~2% and we suggest increasing the step-down's magnitude accordingly.**

102.3

For both the 2025 step-down and the 2030 target, CARB must substantially increase the ambition of the LCFS program in order to reaffirm the LCFS as a program that attracts and rewards long-term capital investment and infrastructure development

Two weeks ago, CARB published data from Q4 2023 showing a 17.3% achieved CI reduction¹. That puts the program roughly achieving the program's targets *for 2028*. We at Generate specialize in climate investing, and we cannot point to another decarbonization program that has so wildly outpaced its targets. As CARB is aware, the consequence of that rapid success

¹ California Air Resources Board. *LCFS Quarterly Data Spreadsheet*. April 2024.

has been a collapse of the market price of LCFS credits in the face of substantial excess supply; at present, **LCFS credit prices are the lowest they have been since 2015.**

The market is demanding more ambition than what has been proposed to date, including that from the April 10 Public Workshop. Pricing has fallen nearly 30% since the publication of the workshop documents containing the revised step-down values². The remedy for this is greater ambition for both the 2025 step-down as well as for the 2030 CI reduction target.

102.3
cont.

In the April 10 workshop, we noted in our oral remarks that we would include details of why we viewed a 5% step-down for 2025 to be inadequate. Since then, Q4 2023 data showing nearly 3m MT of excess credits has made this point even clearer. With a 5% step-down, we would expect a continued rapid build in the credit bank – more than doubling over the next 3 years – and an immediate triggering of the Auto-Acceleration Mechanism. It isn't hard to see why: the achieved CI reduction increased by over 4% from Q4 2022 to Q4 2023, and at the end of 2023 that metric sits just 1.5% below where a 5% step-down would place the CI target for 2025. No matter which forward-looking assumptions we use, we get to a 5% step-down being woefully inadequate.

The 7% step-down proposed in the April 10 workshop is also insufficient. While we had initially thought that 7% would be fine, the 2023 Q4 data release combined with the previously discussed error in the adjustment to biomass-based diesel fuels' CI scores pushes this step-down level outside of the range that would balance the market. Our modeling shows an early AAM triggering if this were the chosen step-down and a continued build to the credit bank for the next several years.

Considering the latest data and the other adjustments CARB has communicated in this rulemaking process, our view is that a *minimum* of a 9% step-down is needed to avoid the AAM being triggered, and that a 10% or 11% step-down not only must be considered but are the lowest values at which we would anticipate the credit bank being worked down over time. Each of these scenarios includes CARB maintaining the view that the 30% 2030 target is set. We know that there may be a degree of “sticker shock” to the numbers suggested; CARB must realize, however, that the real sticker shock is seeing credits trade *below \$50/MT*. **At present pricing, the LCFS program is not a catalyst for investment.** In each of our prior letters to CARB, we have strongly recommended implementing the step-down in 2024 – a year in which we now believe there will be more than 12m MT added to the credit bank – to avoid the increased magnitude in the step-down that would be needed if CARB waited until 2025; given the delay in this rulemaking, **these levels of action are not only justified but are necessary.**

102.4

Alternatively, CARB could choose to adjust the 2030 CI reduction target and lessen the need for as large of a 2025 step-down. If CARB were to adjust the 2030 target to 32%, a 9% step-down would be adequate to promote a stable investing environment. With a 35% 2030 target, a 7% step-down becomes viable. As we have discussed in prior letters, these two adjustments to the CI schedule interact with one another and CARB has the ability to lessen the necessary magnitude of the change in one category by increasing the change in the other. Regardless of the specific values chosen, it is clear that this aggregate magnitude of targets is needed.

² Argus Media. *CA LCFS Spot Price*. Accessed May 2024.

Closing Comments

102.5 While there are other areas where we have interest in CARB adjusting the current proposal – particularly the AAM and RNG treatment, which we have commented on several times in prior letters – we believe that those considerations must be secondary at this stage to CARB finalizing the implementation of this rulemaking with an appropriate level of programmatic ambition. For years, we have collaborated with CARB and other market stakeholders in an effort to form a more perfect LCFS program, and we seem to be approaching the resolution of that process. It is vital for it to result in a program that can once again attract the needed investment to decarbonize California’s transportation system with speed and scale.

To reach that end state, the core adjustments from the latest proposal we request are:

- Finalizing the LCFS rulemaking at the June or July CARB board meeting;
- Including a 2025 CI step-down of at least 9% and ideally 11%, and;
- Increasing the 2030 CI reduction target to at least 32%;

102.6 Generate appreciates the opportunity to provide commentary and suggestions, and we look forward to collaborating with CARB on finalizing this process. Should you have any questions about the information contained herein, please do not hesitate to contact us.

May 10, 2024

Rajinder Sahota
Deputy Executive Officer – Climate Change and
Research
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Comments submitted electronically

RE: Comments Relate to April 10th Low Carbon Fuel Standard Workshop

Dear Ms. Sahota,

Air Products is pleased to provide comments in support of the California Air Resources Board (CARB) rulemaking for the Low Carbon Fuel Standard (LCFS). We are very appreciative that CARB has recognized the substantial role that hydrogen will play to decarbonize transportation, and we believe that this role can be further strengthened in the 15-day amendment package. The refinements we suggest will help better position California for the rapid ramp-up of hydrogen that is needed to deliver on the state's climate ambition as underscored in the 2022 Scoping Plan Update the Board approved.

Summary: Key Areas of Support and Improvement

The following is a brief summary of the key improvements we suggested in our prior 45-day package comment later. The remainder of this letter will focus on more substantive improvements that are needed to strengthen the program, including discussion of issues raised at the April 10th workshop.

- 103.1 • Air Products supports adopting and implementing the amendment package as soon as possible with an effective date for any stringency improvements in 2024 via pro-ration.
- 103.2 • We support the most ambitious carbon intensity (CI) reduction targets feasible and a robust stepdown of at least 9% prorated for 2024 to send a strong signal to the market once the rule is effective.
- 103.3 • We support retaining the proposed rate of annual reductions in CI with the enhanced 2025 stepdown (i.e., a 9% stepdown in CI in 2025 should be propagated through the year-by-year stringency translating into a 2030 CI reduction target of 34%)
- 103.4 • We support the inclusion of the Auto-Acceleration Mechanism but believe the assessment should start in 2026 based on 2025 data to provide for a timely assessment of whether the increased stringency and associated stepdown are sufficient.
- 103.5 • We strongly support the inclusion of a technology-neutral, CI-based, book-and-claim approach for hydrogen. However, we suggest that it be applied to all transportation fuels consumed in California, regardless of where they are produced, and consistent with standard treatment of fuels under the LCFS program.

- 103.6 • We appreciate the extension of low-CI electricity book-and-claim to include process energy demand for the full hydrogen fuel value chain. However, we believe eligibility for all transportation in the current regulation should be maintained and the resource-shuffling and time-matching requirements should apply equally to both hydrogen and electricity.
- 103.7 • We support the additional time provided to hydrogen for the beneficial use of biomethane and suggest that there not be a sunset for avoided methane to the extent biomethane is used to produce fuels that are used by zero emission vehicles (e.g., renewable hydrogen used in fuel cell vehicles).
- 103.8 • We applaud the proposed extension of Hydrogen Refueling Infrastructure (HRI) crediting to medium and heavy-duty vehicles, along with additional time for light-duty vehicle stations and look forward to working on language with CARB to accommodate refueling stations that serve all vehicle types.
- 103.9 • We appreciate and strongly support the inclusion of a Tier 1 Simplified Calculator for hydrogen, as well as clarification that hydrogen plants that are not co-located with refineries are eligible under the project-based crediting provisions.

Program Stringency

103.10 We urge CARB to be as ambitious as possible in setting the new carbon intensity reduction targets between now and 2045 and align targets with levels no less than what is needed to achieve California's greenhouse gas targets and outcomes established in the 2022 Scoping Plan Update. CARB should be confident in setting ambitious standards, given that existing, robust cost-containment provisions in the regulation provide regulated party protection. As discussed in the 2022 Scoping Plan Update, a statewide carbon reduction target of 48% below 1990 levels by 2030, as well as carbon neutrality by 2045, create decarbonization targets that need to be supported by enhancing the stringency of the LCFS program. The transportation sector and fuel production pathways are the largest component of statewide greenhouse gas emissions, accounting for about half of the state's climate footprint and an even greater portion of emissions that contribute to ozone and particulate matter adversely impacting the health of millions of Californians, but particularly those located in our most vulnerable communities. As such, the LCFS needs to provide, at a minimum, a proportional amount of the reductions toward the 48% reduction target.

103.11 Based on the most recently published (Q3 2023) banked credit balance of over 20 million metric tonnes (MMTs) and the current rate of growth suggesting that the bank balance will easily be between 25 MMT and 30 MMTs by 2025, a step-down of at least 9% is necessary and feasible. On slide 47 of the April 10th workshop presentation, CARB estimated a bank drawdown of 27 MMTs (cumulative between 2024-2046) with a 9% stepdown and 30% CI reduction target in 2030. This suggests that the cumulative bank drawdown over the long-term is well matched to the anticipated 2025 bank balance. Based on the historical rate of innovation in the production of progressively low-CI fuels, the projections likely understate the rate of innovation providing the program maintains clear and ambitious targets. We also request that a prorated stepdown occur for the partial year of 2024, as soon as the rule is effective, to send the right signal to the market as early as possible.

103.12 We support CARB's proposed AAM, but request that the implementation be set one year earlier than proposed to allow faster acceleration of the targets – providing increased stringency to the program if

103.12
cont.

the 2025 stepdown fails to bring the program back in balance. The signal to the market has been diminished based on substantial overcompliance for many years and based on the current and growing cumulative credit bank balance, we foresee this trend continuing unless CARB sets an ambitious CI reduction target. To facilitate the most flexible and effective AAM, we request that CARB change the reference year in 95484 (b) from 2027 to 2026 and reference years in 95484 (c), (d), (e), and (f) from 2028 to 2027.

Hydrogen Book-and-Claim Provisions

103.13

Air Products appreciates CARB's willingness to provide a 'book-and-claim' accounting approach for low-CI hydrogen, and we strongly support the provision's focus on a technology-neutral, CI-focused metric to establish eligibility for low-CI hydrogen. Focusing on CI is consistent with CARB's longstanding approach under the LCFS and the definition of clean hydrogen set in the Inflation Reduction Act (IRA). A robust book-and-claim system for hydrogen will ensure that the low-carbon attributes of a hydrogen pathway are retained and applied to end-uses where the most environmental benefit can be derived. This sends the necessary long-term signal for low-carbon hydrogen to play a meaningful role in decarbonizing transportation. CARB's design of such a system will serve as a model to other jurisdictions considering or implementing an LCFS program.

103.14

To that end, one key improvement needed is to eliminate the requirement that eligible hydrogen must be supplied to California in a dedicated pipeline as proposed in §95488.8(i)(3)(A). This requirement places an unnecessary constraint on a nascent market and ***will stifle investments*** at a time when massive capital outlays are ***needed to bring low-carbon hydrogen to scale***. There are no dedicated interstate hydrogen pipelines to California. As such, this requirement favors only in-state hydrogen pipelines and fails to recognize the value of using hydrogen as a feedstock to renewable fuels produced out of state and imported for use in California. These fuels are actively contributing to decarbonizing California's transportation fuel mix and will become more important as sustainable aviation fuel is further incented in the regulation and through other policies. A specific geographic limitation directing that the hydrogen be supplied to California would make a wide array of hydrogen fuel supplies supporting low carbon transportation fuels for California ineligible, consequently lowering the incentive for producing low-CI hydrogen for California fuels and forgoing related emission reductions. We request that CARB modify §95488.8(i)(3)(A) as follows:

"Low-CI hydrogen is injected into a dedicated hydrogen pipeline physically connected to California-a distribution system or a production facility that provides transportation fuel to California."

§95488.8 (i)(3) also limits the use of a low-CI hydrogen book-and-claim approach to hydrogen used directly as a transportation fuel and hydrogen that is used to produce alternative fuels. As long as hydrogen is still an eligible feedstock for project-based crediting in §95489, low-CI hydrogen book-and-claim should be available to all transportation fuels consumed in California, including conventional fuels. We request CARB make this improvement to enable more emission reductions across a broader array of transportation fuels and further spur investment in low-CI hydrogen. We recommend modified language in §95488.8(i)(3) as follows:

"Book-and-Claim Accounting for Pipeline-Injected low-CI Hydrogen Used in FCV and Alternative Transportation Fuel Production. Indirect accounting may be used for low-CI

103.14
cont.

hydrogen used in FCVs or to produce alternative transportation fuel for transportation purposes provided the conditions set forth below are met:....”

Low-CI Electricity Book-and-Claim Provisions

103.15

Air Products strongly supports CARB’s proposal in §95488.8(i)(1) to extend the existing book and claim accounting approach for low-CI electricity to include the process energy associated with other components used to process and distribute hydrogen, like liquefaction and compression. By looking beyond just the production of feedstock hydrogen, this proposal will enable greater carbon reduction ambition in California policies. Extending book-and-claim provisions to process energy will not only incentivize bringing more renewable production on-line but will also enable hydrogen to further lower its CI and help California decarbonize cars, trucks, buses, and other combustion-dependent equipment.

Because hydrogen is an important feedstock in the manufacture of either renewable biofuels or conventional transportation fuels (under the project-based crediting provisions), and the expectation that these fuels will be used for decades, as indicated in the presentation at the workshop, CARB should encourage all emission reductions possible in all fuels used for transportation in California. Furthermore, alternative fuels have a global supply chain that serves the California market. Hydrogen will also be served by the global market, and a wider signal to the low-carbon hydrogen market will further lower emissions, serve California’s transportation energy needs and provide leadership to other jurisdictions. We request retention of the end-use flexibility provided in the current regulation by modifying the following provisions as indicated:

Modify proposed provision 95488.1 (i)(1): *as follows:*

“... for hydrogen production ~~through electrolysis~~ and processing for transportation purposes (including hydrogen that is used in the production of ~~as~~ a transportation fuel), or for direct air capture projects, provided the conditions set forth below are met:....”

Modify proposed provision 95488.8 (i)(1)(C) as follows:

“For direct air capture projects or for hydrogen used as a transportation fuel (including hydrogen that is used in the production of a transportation fuel), low-CI electricity must meet the following criteria: ...”

Hydrogen Refueling Infrastructure (HRI) Credits

103.16

Air Products strongly supports the expansion of crediting to medium and heavy duty (MHD) vehicles and continued crediting for light duty (LD) vehicles. The current HRI program, in combination with other California incentives, has been very effective in promoting the build-out of zero-emission vehicle infrastructure. It is important that CARB build on this success by expanding the program to the truck and bus markets. This expansion will complement CARB’s ambitious goals under the Advanced Clean Truck (ACT) and Advanced Clean Fleet (ACF) regulations and help advance the state’s goals for zero-emission vehicles in line with Executive Order N-79-20.

Air Products believes that multi-modal stations, which include fueling for both Light-Duty (LD) and MHD vehicles, utilizing shared compression, storage and dispensing equipment, will play an important role in

103.16
cont.

California's hydrogen fueling network, provided that the correct policy signals are in place. Clarity is needed in the regulation or in guidance as to how the provisions in the separate LD and MHD sections apply and complement one another so as to recognize and encourage efficiencies associated with multi-modal stations. Please reference our prior comments on the 45-day package for the language we proposed in this regard at the following link: [Air Products comments 45-day package](#).

103.17

We understand that CARB has some concern that reporting/recordkeeping will be difficult in discerning when vehicles of different types are fueling – LD vs. MD vs. HD. Specific quarterly reporting parameters for hydrogen used as a transportation fuel include the quantity of hydrogen fuel dispensed per fueling station equipment, as set forth in section 95483.2(b), with a certified fuel pathway code and with transaction type "FCV Fueling" by vehicle weight category: LDV & MDV and HDV. 95941(d)(2) (D) prescribes a methodology for distinguishing between vehicle classes for natural gas fueling. A similar approach can be applied to a hydrogen fueling event of 10 kg or less would be considered to have been supplied to a LD vehicle and fueling events of greater than 10 kg would be considered to have supplied a MHD vehicle. For hydrogen dispensing, this includes the station owner's declaration that the station meets an appropriate SAE protocol for LDV, MDV, and HDV vehicles and appropriate countermeasure(s) that prevent the compressed hydrogen storage system (CHSS) gas temperature from exceeding the CHSS maximum temperature limit. We believe that viable methodologies can be refined with CARB as part of the post-adoption implementation process.

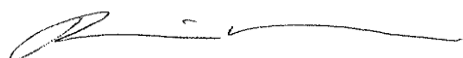
103.18

We recommend that CARB realign the definition of "Application" in the regulation to correspond to the categories of vehicle types for the purposes of the HRI categories. For example, with the transition of ZEV-HRI crediting to LD-HRI crediting, the term LD becomes a standalone application. At the same time, the EER classes for LMDV and HDV need to be maintained for accurate credit calculation.

103.19

Air Products appreciates the opportunity to provide this feedback for the April 10th workshop and we would be happy to meet with CARB to discuss any of these topics further. Please feel free to contact me at hellermt@airproducts.com.

Respectfully,



Miles Heller
Director, Greenhouse Gas, Hydrogen, and Utility Regulatory Policy



May 10, 2024

California Air Resources Board
P.O. Box 2815
Sacramento, CA 95812
[submitted electronically]

RE: Electric Hydrogen Comments on Low Carbon Fuel Standard April 10, 2024, Workshop

Dear California Air Resources Board,

Electric Hydrogen¹ appreciates the opportunity to submit comments to the California Air Resources Board (CARB) on the April 10, 2024, Low Carbon Fuel Standard (LCFS) Workshop.

With significant facilities, management groups, and employees in California and Massachusetts, Electric Hydrogen manufactures the world's most powerful electrolyzers for critical industries to produce low-cost green hydrogen. Our 100 MW electrolyzer plant is designed to load-follow variable renewable energy resources and enable customers to efficiently convert renewable electrical energy into clean molecular energy in the form of hydrogen. Electric Hydrogen's mission is to achieve cost parity with fossil fuels in a timeframe that matters. Put another way, the company exists to make green hydrogen an economic inevitability, giving hard to decarbonize industries, like heavy-duty transportation, aviation, and maritime transport, a viable and cost-effective solution to meet their urgent net-zero climate objectives. Green hydrogen is a necessary tool in the energy transition to a net-zero economy.

The LCFS has been fundamental to reducing carbon emissions from the transportation sector, establishing the markets for zero-emission vehicles and zero-carbon fuels, including hydrogen. Overall, California has already recognized the pivotal role that hydrogen will play in the state's decarbonization efforts. As prominently emphasized in CARB's 2022 Scoping Plan, the attainment of carbon neutrality hinges upon the expansion of clean hydrogen to address hard-to-electrify end uses, including medium- and heavy-duty transportation and aviation. Accordingly, the Scoping Plan finds that California will have to increase green hydrogen production 1,700-fold.²

To leverage hydrogen for decarbonization, the state must drive significant demand for green hydrogen. The LCFS program can increase the demand for green hydrogen within the transportation sector, which will drive the growth of the industry and decrease the costs for green hydrogen across the economy.

¹ See <https://eh2.com/>.

² California Air Resources Board, *2022 Scoping Plan for Achieving Carbon Neutrality*, December 2022, page 8. Available at: <https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf>



Aviation is one of the best use cases for hydrogen in the transportation sector. Hydrogen is a necessary feedstock in sustainable aviation fuel (SAF), including both SAF produced from biomass and power to liquids (PTL) SAF. Utilizing green hydrogen as opposed to gray hydrogen in the production of SAF lowers the carbon intensity of these fuels, eliminates local air pollution from the hydrogen production process, and creates a source of demand for green hydrogen that can help the industry scale in the near-term.

To enable the LCFS eligibility of green hydrogen as a feedstock in SAF production, Electric Hydrogen would like to highlight two key points:

- Electric Hydrogen Supports the Increased Stringency of the LCFS
- Electric Hydrogen Recommends CARB Allow Book-And-Claim Delivery of Low-CI Electricity for Electrolytic Hydrogen Production Used as a Feedstock in Transportation Fuel

Electric Hydrogen Supports the Increased Stringency of the LCFS

104.1

Electric Hydrogen supports the incorporation of a strong CI reduction target of at least 30 percent by 2030 with increasing stringency in subsequent years. Specifically, Electric Hydrogen supports the inclusion of an “auto-acceleration mechanism,” and a more ambitious initial step-down as considered in the April 10 staff presentation. Increasing the stringency of the program will be an important step in helping to achieve California’s transportation decarbonization goals and sustaining higher credit values within the program.

104.2

Electric Hydrogen Recommends CARB Allow Book-And-Claim Delivery of Low-CI Electricity for Electrolytic Hydrogen Production Used as a Feedstock in Transportation Fuel

As proposed in the December 2023 staff’s proposed amendments, § 95488.8. subsection (i)(1) restricts the use of book-and-claim delivery of low-CI electricity to electrolytic hydrogen used in fuel in fuel cell electric vehicles (FCEVs).³ This provision artificially limits the market for LCFS eligible green hydrogen to less than 0.3% of California’s current hydrogen market. Without amendment, this restriction will unnecessarily limit growth of the green hydrogen market and miss an important opportunity for California to drive emissions reductions in the transportation sector, especially in hard to decarbonize transportation modes, including aviation. By adopting this amendment, CARB can encourage the replacement of natural gas with green hydrogen as a feedstock in the production of SAF.

Extending the ability to utilize book-and-claim delivery of low-CI electricity in hydrogen production for liquid transportation fuels would also create a level playing field with hydrogen produced from renewable natural gas (RNG). § 95488.8 subsection (i)(2) of the staff draft allows for the utilization of book-and-claim delivery of RNG, including for RNG used in the production of a liquid transportation fuel. This allowance applies to production of any kind of liquid

³ CARB, *Staff Report: Initial Statement of Reasons*, December 2023. Available at: <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/isor.pdf>



transportation fuel including both conventional gasoline and diesel as well as low- and zero-carbon liquid transportation fuels like SAF.

Electric Hydrogen respectfully requests that CARB amend the staff draft to allow for book-and-claim delivery of low-CI electricity for hydrogen used as a feedstock in SAF.

Conclusion

Electric Hydrogen is fully committed to helping California meet its climate goals. We look forward to continuing to work with CARB on this critically important effort.

Sincerely,

/s/ Paul Wilkins

Paul Wilkins
Vice President for Policy and Government Engagement
Electric Hydrogen



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CONTACT

WORLD ENERGY HEADQUARTERS

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Boston, MA 02110

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e: info@worldenergy.net

May 10, 2024

Rajinder Sahota

Deputy Executive Officer for Climate Change & Research

California Air Resources Board

1001 I Street

Sacramento, CA 95814

RE: World Energy's Comments on the April 10 Low Carbon Fuel Standard Workshop

Dear Ms. Sahota and CARB Staff,

World Energy values the opportunity to provide comments on the proposed amendments to the Low Carbon Fuel Standard (LCFS). We thank CARB staff for your efforts and dedication through this extensive rulemaking to engage in continuous stakeholder feedback and ensure proper changes are made to increase the ambition of the LCFS program.

World Energy is one of the largest and longest-serving advanced clean energy suppliers in North America. We were the world's first producer of sustainable aviation fuel (SAF) and remain leaders in the field of renewable fuels. Our facility in Paramount, CA is in the final stages of conversion from a petroleum refinery to a 100% renewable fuels bio-refinery. When completed, World Energy's Paramount facility is projected to increase production capacity to approximately 350 million gallons of low carbon fuels per year. We have made significant investments in continuously reducing the carbon intensity of our fuels and producing very-low carbon fuels for the California market. We have fuel pathways providing up to an 85% reduction in carbon intensity (CI). Our fuels have helped the LCFS program meet and exceed its targets, and our Paramount plant is a premiere example of the clean energy future. World Energy continues our commitment to reduce transportation emissions including investing \$4 billion in scaled manufacturing and new technologies to achieve our goal of supplying 1 billion gallons of sustainable aviation fuel annually by 2030.

World Energy wishes to provide the following comments in response to the potential refinements to the proposed regulatory amendment package presented on April 10:

105.1

World Energy recognizes the time and work CARB staff has put into this rulemaking process. However, we urge CARB to finalize the rulemaking quickly and present the proposal to the CARB Board as early as possible. The proposed amendments are important to ensuring the program continues lowering the CI of fuels, but they will need to be implemented soon to send the correct market signals. As the rulemaking timeline continues to extend, uncertainty is arising both for LCFS participants and investors, which can be detrimental to the program. Finalizing the LCFS rulemaking will provide clarity to the market that low carbon fuels will continue to play a crucial role in decarbonizing California's transportation sector.

COMPANY

World Energy

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105.1
cont.

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Increased Step-Down

World Energy appreciates the consideration and additional modeling presented during the April 10 workshop which included a 7% and 9% step-down. As mentioned in our previous written comments to the proposed amendments, the 5% step-down is not enough to right-size the current credit to deficit ratio. Increasing the step-down to 9% will recalibrate the credit bank and make use of the existing credit bank, which is likely to approach or surpass 30 million credits this year.

105.2

However, pursuing a more aggressive stepdown should not mean a more gradual year-over-year reduction slope between 2026 and 2030. Instead, a 9% stepdown should be coupled with the same 2030 reduction slope that was proposed in the 45-day rulemaking package. This alone will calibrate the market and ensure that California is pursuing the greatest possible emission reductions.

Sustainability Criteria

We recognize that sustainability is a critical provision for biofuel development, and we actively participate with the Roundtable for Sustainable Biomaterials (RSB) to receive regular ongoing third-party audits to provide our customers with assurance and confidence that our practices comply with the RSB 12 Principles and Criteria of Sustainability.

105.3

We would also suggest that CARB consider recognizing Climate Smart Agricultural practices in a manner that could incentivize the practices with feedstock crops that build and improve soil carbon while simultaneously producing biofuels that can maximize the atmospheric carbon capturing ability of the biofuel value chain. This could unlock the potential for truly negative CO₂ liquid fuels that can better achieve the program goals, broaden agricultural community engagement, and extend the value chain to align the program benefits with a broader participation of the agricultural community.



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105.3
cont.

Specifically, analyzing farm-level sustainability is an opportunity to achieve further tangible reductions in CI. Opening the program to farmers in this manner will create additional economic opportunities and incentivize innovation for improved regenerative agriculture practices to further boost the transition from fossil fuels.

Because of the scale of the climate problem we are addressing, we need to construct a supportive supply chain that can maximize the natural carbon capturing capability of the biosphere at scale with durable support and commitment through the transition from fossil fuels. The LCFS can continue to be the most successful tool for achieving that success.

We appreciate CARB staff's ongoing work during this rulemaking and considering the feedback provided by stakeholders. World Energy looks forward to the finalization of this LCFS rulemaking to ensure the needed signals are in place.

Sincerely,

A handwritten signature in black ink, appearing to read 'SL', with a long horizontal flourish extending to the right.

Scott Lewis
President, World Energy Supply Zero, LLC
225 Franklin Street, Suite: 2330
Boston, MA 02110
Telephone: +19053306997
Email: Slewis@worldenergy.net
ICE. slewis14



May 10, 2024

California Air Resources Board
P.O. Box 2815
Sacramento, CA 95812
[submitted electronically]

RE: Comments of Joby Aviation on the April 10th Workshop on the Low Carbon Fuel Standard

Joby Aviation¹ appreciates the opportunity to provide comments on the April 10, 2024, Low Carbon Fuel Standard (LCFS) Workshop.

About Joby Aviation

Joby's mission is to help the world connect faster and more easily with the people and places that matter most by delivering a new form of clean, quiet, electric vertical take-off and landing (eVTOL) aerial transportation. Building on recent advancements in energy storage, microelectronics, material science, and software, we are developing an all-electric aircraft with zero operating emissions that will transport a pilot and four passengers at speeds of up to 200 mph, while also having the ability to take off and land vertically.

Developing sustainable mobility solutions has never been more needed given the threat that climate change poses to our communities and to our planet. According to the U.S. Environmental Protection Agency (EPA), the top source of CO₂ emissions in the U.S. is the transportation sector. We expect the electrification of transportation to accelerate and extend to the skies in the decade ahead, representing a bright spot where technology, economy, and sustainability converge. Applying electrification to small aircraft unlocks new degrees of freedom in aircraft design that were not possible with traditional, combustion engines.

Our aircraft has been specifically designed to achieve a considerably lower noise footprint than that of today's conventional aircraft or helicopter. It is quiet at takeoff and near silent when flying overhead, blending seamlessly into the environment. This will allow us to operate from new skyport locations nearer to where people live and work, in addition to utilizing the more than 5,000 heliport and airport infrastructure facilities already in existence in the U.S. alone.

¹ See <https://www.jobyaviation.com/>.

Joby is headquartered in Santa Cruz, California, with over 1,400 employees across the state. In 2022, we completed the construction of our pilot production lines in San Carlos and Marina, California, and we began manufacturing our production prototype aircraft. We are excited to support the clean transportation and climate goals of our home state.

Zero-Emission Aviation is Key to Meeting California's Climate Goals

Today, the combustion of aviation and other transportation fuels releases substantial amounts of greenhouse gasses into the atmosphere. The transportation sector has the highest dependency on oil over any other sector, with over 90% of energy coming from fossil fuels.² At the same time, the aviation industry is undergoing rapid expansion due to the increasing popularity and accessibility of flying. The rise of low-cost carriers and a growing middle-class population worldwide have fueled a surge in air travel demand. Joby strongly supports the broader accessibility of flying as a mode of transportation. We also believe that eVTOL will play an important role in replacing internal combustion vehicles on the road. However, there is a challenge in minimizing the environmental impacts while also reaping the undeniable benefits of increased mobility and connectivity.

California and CARB have already created goals to reduce emissions from aviation. These include:

1. 20% of aviation fuel demand met by electricity (batteries) or hydrogen (fuel cells) by 2045; and
2. Sustainable aviation fuel meeting most or the rest of the 2045 fuel need.³

These goals are ambitious, and Joby and others in the aviation sector are working to ensure that zero-emission aviation becomes a reality in California. To advance these goals, CARB will need to utilize every tool available to unlock zero-emission and sustainable aviation technologies and fuels. This includes the LCFS, which will play an important role in incentivizing a less carbon-intensive aviation industry. CARB should seek to streamline the participation of the aviation sector in the LCFS, such as by creating Tier 1 or Lookup Table participation pathways for electric aviation. It is also important that CARB initiate a rulemaking process to implement its aviation goals.

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² See Data from the International Energy Agency: <https://www.iea.org/energy-system/transport>

³ CARB 2022 Scoping Plan at p.73. Available at: <https://www2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf>

Joby Supports a Stronger LCFS Program

106.3 As stated in our comments to the proposed changes to the LCFS in February 2024,⁴ Joby supports increasing the carbon intensity (CI) reduction target of the LCFS program to at least 30 percent by 2030 and also increasing stringency in later years. As emphasized in the 2022 Scoping Plan Update, the aviation sector holds an important role in California's ambitious journey toward carbon neutrality by 2045,⁵ and the LCFS program is a critical instrument in facilitating the decarbonization of aviation.

106.4 Beyond setting a more ambitious yet attainable CI target for 2030, it is imperative to structure the LCFS program to be adaptable to market dynamics, ensuring support for continued investments in the cleanest low-carbon technologies. The inclusion of an "auto-acceleration mechanism," and a more ambitious initial step-down as considered in the April 10 staff presentation will help to expedite investments in low-carbon fuels and serve to maximize California's potential for emissions reduction in the transportation sector. This multifaceted approach aligns with Joby's commitment to sustainable aviation and complements the broader initiatives aimed at achieving California's environmental objectives.

Joby Encourages CARB to Explicitly Include Electric and Hydrogen Aviation for Capacity Credits

106.5 Joby supports staff's proposed amendments to the LCFS from December 2023, which expand the existing capacity credits for light-duty to now include medium- and heavy-duty (MHD). Joby is appreciative of both capacity credits: (1) MHD Direct Current (DC) Fast Charging Infrastructure (FCI) and (2) MHD hydrogen refueling infrastructure (HRI). As outlined, the "MHD provisions will provide LCFS credits for the unused refueling capacity at eligible stations and sites, which will naturally phase out as more vehicles become operational and vehicle refueling demand increases."⁶

106.6

106.7 Joby is particularly supportive of the proposed expansion of the MHD-HRI and MHD-FCI provisions to include private infrastructure in addition to public infrastructure.⁷ However,

106.8 to ensure the LCFS decreases the CI of California's transportation fuel pool and provides

⁴ Joby Aviation Comments to Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 45 Day. Available at: https://www.arb.ca.gov/lispub/comm/iframe_bccomdisp.php?listname=lcfs2024&comment_num=7006&virt_num=331

⁵ CARB 2022 Scoping Plan. Available at: <https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf>

⁶ CARB, Staff Report: Initial Statement of Reasons at p. 28. Available at: <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/isor.pdf>

⁷ CARB, Staff Report: Initial Statement of Reasons at p. 29. Available at: <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/isor.pdf>

106.8
cont.

an increasing range of low-carbon and renewable alternatives, Joby believes it is imperative that electric and hydrogen aviation is explicitly included within the relevant definitions. As currently defined, “‘private MHD-FCI charging site’ means an EV fast charging site that can be limited to be available only to MHD EVs under single ownership.”⁸ Additionally, “‘private MHD-HRI station’ means a hydrogen refueling station that can be limited to be available only to MHD FCEVs under single ownership.”⁹ These definitions, as currently stated, are unclear about the eligibility of electric and hydrogen aviation. Therefore, Joby urges CARB to explicitly include electric and hydrogen aviation within both definitions. In doing so, the LCFS program can incentivize the decarbonization of aviation within the transportation sector and, in doing so, drive progress towards achieving California’s climate targets.

The inclusion of electric and hydrogen aviation will likely have national impacts given that California policy frameworks are often used as models for federal legislation. California’s LCFS is also often replicated by other states. To date, four states have adopted similar clean fuel programs and an additional eight states have pending policies.¹⁰ Therefore, the explicit inclusion of electric and hydrogen aviation can help set precedent for a cleaner aviation sector nationally.

Conclusion

In summary, Joby is appreciative of CARB staff for hosting the April 10, 2024, Workshop and looks forward to working with CARB on achieving California’s zero-emission aviation and larger climate goals.

Sincerely,

/s/ George Kivork

George Kivork

Head of U.S. State & Local Policy

Joby Aviation

⁸ CARB, APPENDIX A-1 Proposed Regulation Order Proposed Amendments to the Low Carbon Fuel Standard Regulation at p. 21. Available at:

https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/lcfs_appa1.pdf

⁹ Ibid.

¹⁰ David M. McCullough, Matthew W. Morrison, Elorm K. Sallah, Steve R. Brenner, “Revving Up: Eight States in Gear with Low-Carbon Fuel Standard Legislation,” April 2024. Available at:

<https://www.pillsburylaw.com/en/news-and-insights/eight-states-low-carbon-fuel-standard-legislation.html#:~:text=In%20March%202024%2C%20New%20Mexico,fuel%20standard%20legislation%20or%20regulations.>



CALIFORNIA ASSOCIATION of SANITATION AGENCIES

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May 10, 2024

Matt Botill, Division Chief
Industrial Strategies Division

Cheryl Laskowski, Branch Chief
Transportation Fuels Branch

California Air Resources Board
1001 I Street
Sacramento, CA 95814

Submitted electronically via: <https://ww2.arb.ca.gov/public-comments/low-carbon-fuel-standard-workshop-april-10-2024>

Re: California Association of Sanitation Agencies Comments on the Low Carbon Fuel Standard
Proposed Regulatory Revisions

Dear Mr. Botill and Ms. Laskowski:

The California Association of Sanitation Agencies (CASA) appreciates the opportunity to provide comments on the proposed revisions to the Low Carbon Fuel Standard (LCFS) as discussed during the April 10, 2024, public workshop. CASA continues to urge CARB to carve out the wastewater sector to preserve the use of and credit for our non-fossil renewable wastewater-derived biomethane (biogas) in the LCFS program indefinitely. The wastewater sector will continue to produce and capture biogas, as well as strive to beneficially use (not waste) it for as long as we are performing the essential public service of wastewater and solids treatment with anaerobic digesters. However, removal of the avoided methane credit will render co-digestion projects at WRRFs within California financially infeasible and inadvertently drive co-digestion projects out-of-state. We made similar arguments during the Scoping Plan Update and the more recent development of the Advanced Clean Fleet (ACF) regulations. In fact, the CARB Board included language in the last paragraph of the adopted [Resolution 23-13](#) accompanying the adoption of the ACF Regulations directing staff to work with sister regulatory agencies and CASA to ensure multiple long-term uses of wastewater-derived biomethane. We urge that collaborative process to begin as soon as possible.

CASA is an association of local California wastewater agencies, known as Water Resource Recovery Facilities (WRRFs), engaged in advancing the recycling of wastewater into usable water, as well as the generation and beneficial use of renewable energy, biosolids, fuel, and other valuable resources. Through these efforts we help create a clean and sustainable environment for Californians.

Our members are focused on helping the State achieve its climate change mitigation mandates and goals, which include:

- Reducing short-lived climate pollutant (SLCP) emissions by accepting and co-digesting diverted organic (food) waste from landfills pursuant to SB 1383
- Reducing carbon intensity of transportation fuel by using the biogas we generate
- Providing 100 percent of the state's energy needs from clean and renewable sources
- Increasing soil carbon and carbon sequestration by land applying biosolids and supporting the Healthy Soils Initiative, Climate Smart Strategy, and Wildfire and Forest Resilience Action Plan

As we have noted in previous discussions and comment letters for both the ACF and LCFS regulations, the wastewater sector represents an important in-state partner for meeting SB 1383 organic waste diversion requirements and for development of low-carbon fuels. As documented in the State Water Board's [Co-digestion Capacity Analysis](#) assessing co-digestion capacity at WRRFs, the estimated total available wastewater digester capacity is capable of receiving all food waste required to be diverted from landfills in California for co-digestion. This will exponentially increase the biogas produced and captured at WRRFs.

107.1 cont. The wastewater sector is aligned with LCFS program goals, notably to diversify transportation fuels away from fossil fuel-based sources and achieve carbon neutrality. The biogas generated not only provides a reliable low carbon fuel, but its use safeguards our communities by fueling vehicles that service infrastructure critical to protecting public health and the environment in all geographical dispositions and in response to major events, including planned power outages. CASA continues to disagree with the proposed phase-out of avoided methane crediting for both biomethane and hydrogen pathways, as well as the eventual phase-out of credit for biomethane as a transportation fuel which currently supports and will continue to support wastewater sector fleets in maintaining essential public services of wastewater collection and treatment to protect public health and the environment in the absence of ZEV options and to meet the need for immediate reductions to meet SIP requirements in non-attainment zones for ozone (a priority in the South Coast).

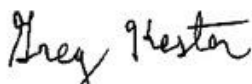
Without considering the full life cycle of biogas to renewable biomethane and hydrogen fuels and the support from the LCFS Program, these projects become financially infeasible, members will be forced to flare a renewable resource, we will not meet near-term SIP requirements in critical air basins, and members will no longer be able to accept diverted food waste in support of achieving SB 1383 mandates for methane reductions.

We strongly urge CARB to preserve the use of our biogas as a viable low carbon fuel in perpetuity since it will always be produced and successful SB 1383 implementation hinges on its beneficial use. Similarly, the proposed ACF Regulations will also inhibit SB 1383 implementation by limiting the use of medium- and heavy-duty trucks using WRRF biogas-derived compressed natural gas to only those in our fleets as of January 1, 2024 – we have proposed that be extended to follow the implementation of SB 1383 and provide WRRFs a pathway for use of the increased biogas. As CASA noted in our comments on the proposed ACF Regulations (and CARB staff acknowledged this in their December 12, 2022, presentation), medium- and heavy-duty electric trucks and vehicles unique to the needs of our sector are not commercially available and we do not expect them to be for many years. Likewise, biogas-to-hydrogen as a transportation fuel for these vehicles is not yet commercially available or demonstrated, both research and demonstrations are necessary to advance that technology and we have offered to work with CARB on those efforts. In the meantime, state regulations and policy should promote biogas deployment using proven technology that most efficiently reduces GHGs to mitigate climate change while also complying with the Omnibus regulations. RNG vehicles also greatly improve air quality in environmental justice communities. Not being able to use them will result in prolonged and increased use of diesel trucks which create 90% worse air quality.

We appreciate this opportunity to comment and your willingness to consider our recommendations. We look forward to continued collaboration to develop pragmatic solutions to these issues. Please let me know if we can set a time to meet for discussion of our recommendations. I can be contacted at

gkester@casaweb.org or at 916-844-5262 and Sarah Deslauriers can be reached at sdeslauriers@casaweb.org or at 925-705-6404.

Sincerely,

A handwritten signature in black ink that reads "Greg Kester". The signature is written in a cursive, slightly slanted style.

Greg Kester
Director of Renewable Resource Programs

cc: Adam Link, Executive Director, CASA
Sarah Deslauriers, Director of Air, Climate, & Energy Programs, CASA
Rajinder Sahota, CARB
Anil Prabhu, CARB
Charlotte Ely, SWRCB
Chris Hyun, SWRCB
Zoe Heller, Director CalRecycle
Mark de Bie, CalRecycle
Cara Morgan, CalRecycle



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THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

1500 K STREET NW | SUITE 650 | WASHINGTON DC 20005

May 10, 2024

RE: International Council on Clean Transportation comments on the **April 10th LCFS Workshop**

These comments are submitted by the International Council on Clean Transportation (ICCT). The ICCT is an independent nonprofit organization founded to provide unbiased research and technical analysis to environmental regulators. Our mission is to improve the environmental performance and energy efficiency of road, marine, and air transportation, in order to benefit public health and mitigate climate change. We promote best practices and comprehensive solutions to increase vehicle efficiency, increase the sustainability of alternative fuels, reduce pollution from the in-use fleet, and curtail emissions of local air pollutants and greenhouse gases (GHG) from international goods movement.

The ICCT welcomes the opportunity to provide comments on the Air Resources Board's Proposed Low Carbon Fuel Standard amendments. We commend the agency for its continued engagement and interest in continuing to improve the effectiveness of one of its flagship climate programs. The comments below offer a number of technical observations and recommendations for ARB to consider in aligning the program with the goals of the 2022 Scoping Plan. New analysis is based on the content presented in the April 10th workshop including modifications to the California Transportation Supply (CATS) model. We would be glad to clarify or elaborate on any points made in the below comments. If there are any questions, ARB staff can feel free to contact Nik Pavlenko (n.pavlenko@theicct.org).

A handwritten signature in black ink, appearing to read 'Stephanie Searle'.

Stephanie Searle, PhD
ICCT Chief Program Officer
International Council on Clean Transportation
stephanie@theicct.org

Summary of comments

The California Air Resources Board (ARB) presented additional analysis on their 45-day Low Carbon Fuel Standard (LCFS) proposal at their public workshop held on April 10th.¹ Staff reviewed different compliance trajectories to align the program with the 2022 Scoping Plan that were first presented in the December 2023 Initial Statement of Reasons (ISOR) report.² These include the proposed scenario (“45-Day Proposal”), Environmental Justice Advisory Committee (EJAC) scenario, and scenarios that include less and more stringent CI reduction trajectories. At the latest workshop, other adjustments were made to ISOR modeling including an updated feedstock supply curve for virgin and waste oils, updated combustion emission factors, and varying step-down rates in 2025 that maintain the proposed 30% CI reduction target in 2030.

108.1

Though ARB discusses the sustainability risks of biomass-based diesel in its 45-Day Proposal, the impact of its proposed sustainability certifications has not been modeled by ARB and there is no evidence that it will demonstrably mitigate growth in unsustainable compliance pathways. In these comments, we evaluate the scenarios and data released by ARB for the April workshop and compare it to program and market data. We compare the real-world growth of biomass-based diesel (BBD) and projected capacity announcements to ARB’s various modeled compliance scenarios. We review these assumptions and re-run the CATS model to project likely fuel volumes using an updated feedstock supply curve and conversion costs below.

In these comments, we also evaluate the proposed changes to the LCFS on the program’s inclusion of dairy biomethane-derived hydrogen, and the impact of the proposed set of deliverability requirements. We assess the potential for out-of-state digester projects to dilute the program’s intended impact on in-state methane emissions and transportation emissions goals.

108.2

We find that the discrepancies between ARB’s modeled scenarios and recent real-world data on BBD production are large and that ARB’s scenarios are not credible. When we rerun ARB’s model using updated data inputs, we find the proposed LCFS amendments will drive over a 600 million gallon to 1 billion gallon increase in BBD consumed in California relative to present-day consumption, which could cause unintended GHG emissions land use change and deforestation globally, undermining the intended impacts of the program. We

108.3

also find that out-of-state biomethane production will significantly dilute the effectiveness of the LCFS in delivering genuine in-state GHG reductions.

Based on our technical analysis, we recommend that ARB:

¹ ARB, “California LCFS Workshop,” <https://ww2.arb.ca.gov/sites/default/files/2024-04/LCFS%20April%20Workshop%20Slides.pdf>.

² ARB, “Staff Report: Initial Statement of Reasons,” Public Hearing to Consider the Proposed Amendments to the Low Carbon Fuel Standard, December 19, 2023.

- 108.4 1. Address gaps in existing LCFS compliance modeling to evaluate the impact of more recent data on lipid supply and renewable diesel conversion costs on the potential market impacts and virgin vegetable oil demand of the LCFS.
- 108.5 2. Implement a cap on the volume of lipid-derived fuels credited under the LCFS program.
- 108.6 3. For all new biomethane-derived hydrogen pathways, implement geographic deliverability requirements within the next three years.

Review of ARB ISOR scenarios

The set of updated scenarios shared by ARB at the April LCFS workshop shed light on possible growth trajectories for biomass-based diesel (BBD), one of the fastest growing fuel pathways under the LCFS program. In 2023, BBD made up 61% of LCFS credits, up from only 8% in 2011.³ Renewable diesel capacity deployment in California has consistently exceeded predictions by the Energy Information Administration (EIA).⁴ Indeed, Murphy and Ro already updated their 2023 LCFS volume projections to account for higher-than-anticipated renewable diesel output and 1.7 billion gallons in additional nameplate capacity refinery conversions slated for this year.⁵

108.7 Evaluating the modeled projections for the program compliance under the LCFS revisions shared by ARB staff in April, it is clear that there is disagreement between the projections and the real-world data reported by ARB through 2023, as well as with the pace of renewable diesel capacity expansion in the U.S. reported by the EIA.⁶ Figure 1 below compares the reported volumes of renewable diesel consumed in California (shown in solid black) and the national-level, existing and announced renewable diesel capacity expansions to ARB's modeled scenarios (shown by the dotted line). Despite the significant drawdown of credits from the step-change and increase in compliance target, the scenarios modeled by ARB all project that renewable diesel consumption will abruptly stop growing starting in 2024, despite continued real-world expansion in refinery capacity to nearly 6 billion gallons by 2025. Based on this, we note that the scenarios may be structurally underestimating the program's impact on renewable diesel demand and therefore understating the risk of continued pressure on vegetable oil markets.

³ ARB, "Low Carbon Fuel Standard Reporting Tool Quarterly Summaries," accessed May 8, 2024, <https://ww2.arb.ca.gov/resources/documents/low-carbon-fuel-standard-reporting-tool-quarterly-summaries>.

⁴ U.S. EIA, "U.S. Renewable Diesel Capacity Could Increase Due to Announced and Developing Projects," July 29, 2021, <https://www.eia.gov/todayinenergy/detail.php?id=48916>.

⁵ Colin Murphy, "Updated Fuel Portfolio Scenario Modeling to Inform 2024 Low Carbon Fuel Standard Rulemaking," 2024, <https://doi.org/10.7922/G25719BV>.

⁶ U.S. Energy Information Administration, "Domestic Renewable Diesel Capacity Could More than Double through 2025," February 2, 2023, <https://www.eia.gov/todayinenergy/detail.php?id=55399>.

108.7
cont.

In particular, we highlight that the scenario in orange (which contains the auto-acceleration mechanism) increases credit prices significantly by raising the program’s ambition to a 39% target by 2030, yet it barely exceeds 2023 reported renewable diesel volumes, essentially limiting future growth of renewable diesel despite rapid increases in supply. In that scenario, credit prices increase rapidly to the cap of \$221/ton without a concurrent increase in renewable diesel consumption above present-day levels.

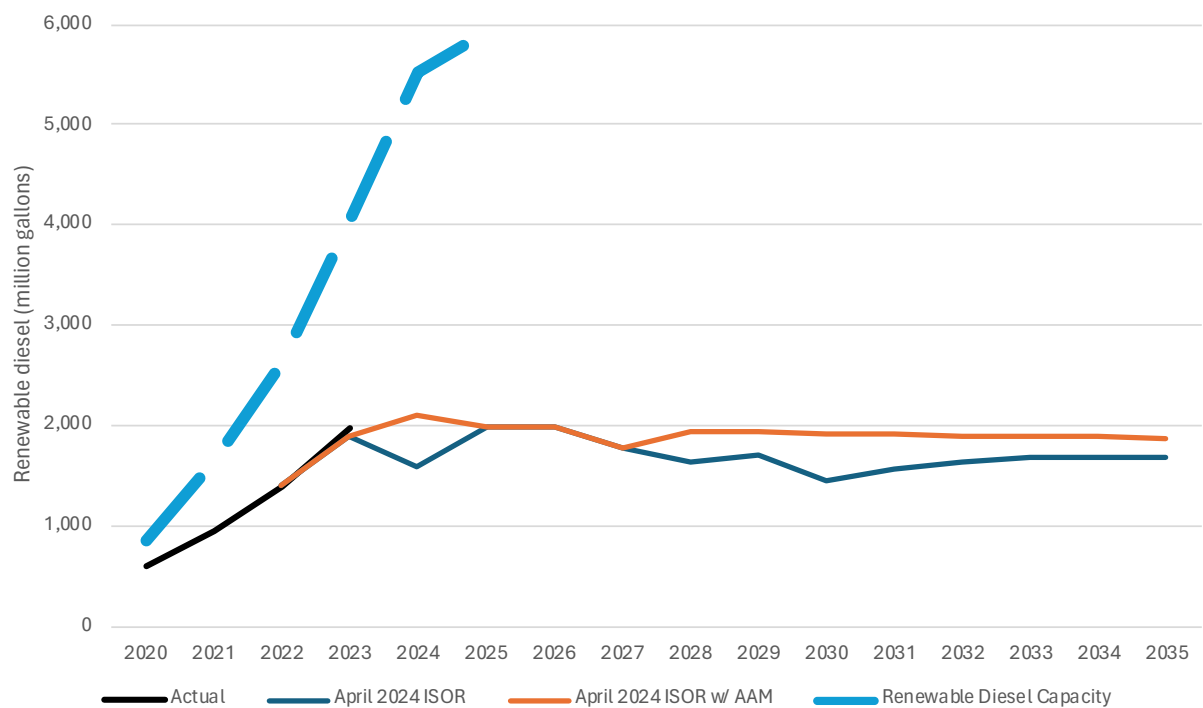


Figure 1: Actual and projected renewable diesel consumption compared to announced capacity

In the subsequent section, we adjust the CATS model developed by ARB to incorporate updated price and availability data for renewable diesel in order to evaluate the risk posed by the program of expanding reliance on soy oil.

Updates to LCFS compliance input assumptions

ARB presented updated supply curves for virgin vegetable and waste oils in their April 10th workshop slides. They report the availability of vegetable oils to be 8.4 million tons while the availability of waste oils is 5.8 million tons based on data calculated from EIA biofuel

production reports.⁷ Given that there is 13.6 million tons of soybean oil consumed in the U.S. today and this quantity is only anticipated to grow due to increased crushing capacity,⁸ ARB's data likely underestimates the availability of soybean oil as a BBD feedstock.

We develop our own supply curves by sourcing annual cost and supply data for soybean oil, yellow grease (i.e., used cooking oil), and tallow from the U.S. Department of Agriculture (USDA) Oil Crops Yearbook tables⁹. We consider the total quantity of soybean oil consumed in the U.S. rather than the quantity consumed in BBD due to the likely diversion of soybean oil from existing markets to the BBD sector to meet rising demand. Since the Oil Crops Yearbook does not report data on yellow grease consumption, we estimate this volume by converting the total volume of waste oil BBD consumed under the Renewable Fuel Standard (RFS) program¹⁰ to tons of feedstock assuming a conversion factor of 0.123 gallons of BBD per pound of waste oil.¹¹ Based on this dataset, the slope of our supply curve is slightly steeper for vegetable oils and flatter for waste oils compared to the input data used by ARB in their own modeling (Figure 2). This indicates that vegetable oil production is more responsive to changes in price while waste oil supply is similar to ARB's assumptions. Both of our supply curves are also shifted upward; thus, for a given feedstock price, a higher volume of feedstock is supplied relative to ARB's modeling.

⁷ U.S. Energy Information Administration, "U.S. Total Biofuels Operable Production Capacity," April 30, 2024, https://www.eia.gov/dnav/pet/pet_pnp_cabio_dcu_nus_m.htm.

⁸ U.S. Department of Agriculture, "Grains and Oilseeds Outlook for 2024" (Oilseeds, Feed Grains, Wheat, and Rice Interagency Commodity Estimates Committees, February 15, 2024), <https://www.usda.gov/sites/default/files/documents/2024AOF-grains-oilseeds-outlook.pdf>.

⁹ "USDA ERS - Oil Crops Yearbook," accessed May 8, 2024, <https://www.ers.usda.gov/data-products/oil-crops-yearbook/oil-crops-yearbook/>.

¹⁰ US EPA, "RINs Generated Transactions," Other Policies and Guidance, <https://www.epa.gov/fuels-registration-reporting-and-compliance-help/rins-generated-transactions>.

¹¹ Hui Xu et al., "Life Cycle Greenhouse Gas Emissions of Biodiesel and Renewable Diesel Production in the United States," *Environmental Science & Technology* 56, no. 12 (June 21, 2022): 7512–21, <https://doi.org/10.1021/acs.est.2c00289>.

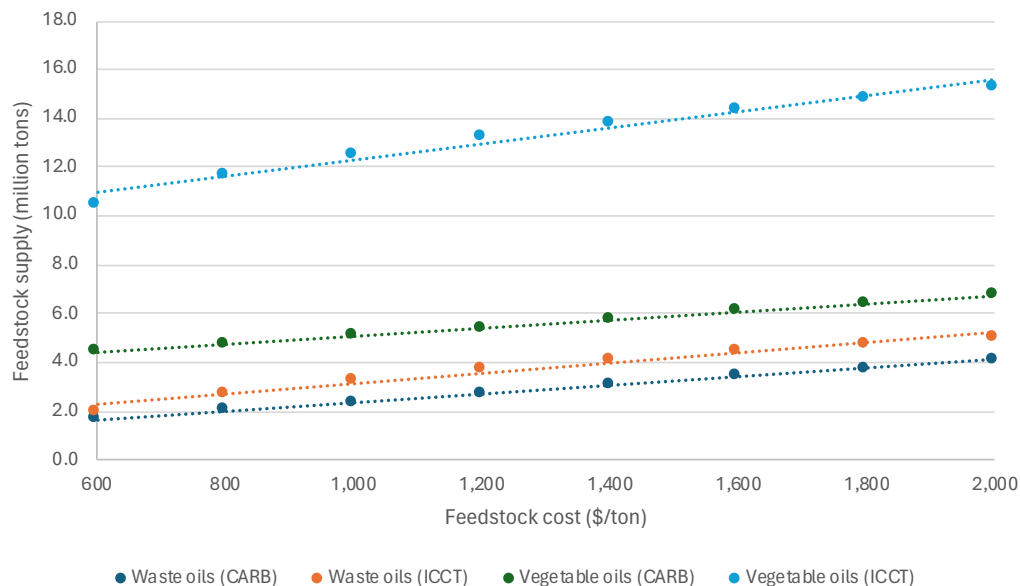


Figure 2: Feedstock supply curve comparison

We also update the conversion costs for renewable diesel and hydrotreated esters and fatty acid (HEFA) facilities, using real-world data. ARB's CATS modeling assumes that renewable diesel has a conversion cost of \$925-1122 per ton, significantly higher than the assumed FAME biodiesel conversion cost of \$106-383/ton in the model. This is inconsistent with the scientific literature as well as market data, which together suggest a lower production cost. Brown et al. (2020), Witcover and Williams (2020) and Pavlenko et al. (2019) estimate the levelized cost for hydroprocessed fuels, with estimates ranging from approximately \$3.50 to \$5.50 per gallon, adjusted for inflation.¹² In these studies, the cost of hydroprocessed fuels was driven primarily by feedstock prices, particularly at higher facility scales which benefit from economies of scale for CAPEX. Drawing from the analysis of Pavlenko et al. (2019), we estimate that the non-feedstock conversion costs alone were roughly \$350 per ton for soybean HEFA.¹³ To evaluate the impact on ARB's projections, we then input this value into CATS for soy renewable diesel, with a cost adjustment for waste oil conversion to account for lower yield. We re-ran the CATS model using these updated

¹² Nikita Pavlenko, Stephanie Searle, and Adam Christensen, "The Cost of Supporting Alternative Jet Fuels in the European Union." (Washington, DC: ICCT, 2019), https://theicct.org/sites/default/files/publications/Alternative_jet_fuels_cost_EU_2020_06_v3.pdf; Julie Witcover and Robert B. Williams, "Comparison of 'Advanced' Biofuel Cost Estimates: Trends during Rollout of Low Carbon Fuel Policies," *Transportation Research Part D: Transport and Environment* 79 (February 1, 2020): 102211, <https://doi.org/10.1016/j.trd.2019.102211>; Adam Brown et al., "Advanced Biofuels – Potential for Cost Reduction" (IEA Bioenergy, 2020), https://www.ieabioenergy.com/wp-content/uploads/2020/02/T41_CostReductionBiofuels-11_02_19-final.pdf.

¹³ Pavlenko, Searle, and Christensen, "The Cost of Supporting Alternative Jet Fuels in the European Union."

assumptions and present our results for the baseline scenario and baseline scenario with one AAM event triggered in Figure 3 below. Here, the volumes of renewable diesel actual consumption (in black) are compared to scenarios modeled by ARB in solid colors, as well as. The two projections generated from the adjusted CATS model are illustrated in the dotted lines).

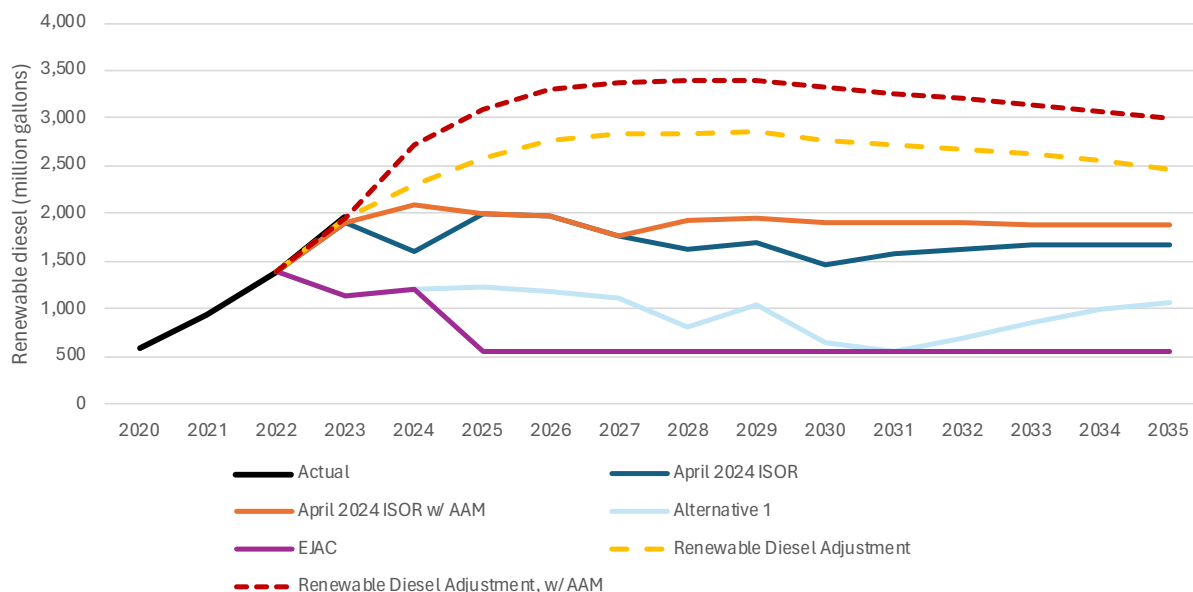


Figure 3: Renewable diesel volumes under proposed and ICCT-adjusted scenario runs

We find that renewable diesel consumption grows to 3.4 billion gallons under a scenario with the AAM triggered and 2.9 billion gallons without a change to the annual compliance trajectory. Comparatively, ARB's modeling falls short of the actual volumes of BBD that were reported in 2023 in quarterly summary reports. For example, while ARB predicts that BBD consumption (including biodiesel and SAF) will not exceed 2.3 billion gallons under the 45-Day Proposal and 2.4 billion gallons if the AAM is triggered, actual consumption of BBD was already 2.3 billion gallons in 2023.¹⁴ While ARB concludes that current program design is sufficient to mitigate adverse environmental impacts from BBD consumption, we find that the emissions impacts of a rapidly growing BBD market are underestimated due to unrepresentative input assumptions.

Limiting California's reliance on lipids is critical to ensure that the LCFS avoids unintended, indirect emissions that could jeopardize its intended GHG targets. BBD consumption presents significant sustainability concerns because it can be sourced from feedstocks grown on high-carbon stock land.¹⁵ BBD feedstocks grown on U.S. pasture and cropland

¹⁴ California Air Resources Board, "Low Carbon Fuel Standard Reporting Tool Quarterly Summaries."

¹⁵ Hugo Valin et al., "The Land Use Change Impact of Biofuels Consumed in the EU: Quantification of Area and Greenhouse Gas Impacts," August 27, 2015.

also lead to greenhouse gas (GHG) emissions impacts from direct land-use change (LUC) and to a greater extent when growing feedstocks for biofuel displaces the same feedstocks consumed in competing sectors including food, animal feed, and consumer products.¹⁶ Waste oils that are later converted to BBD do not directly contribute to LUC, but there is evidence of fraudulent reporting in the U.S. and elsewhere where virgin vegetable oil was miscredited as waste oil under regulatory fuel programs.¹⁷

108.8
cont. Additional measures will be needed in the near-term to limit the supply of BBD entering the California market including imports from ecologically sensitive regions.¹⁸ One such measure is to set a cap on the volume of lipid-based feedstocks credited under the LCFS; this proposal was explored in previous ICCT research¹⁹ and has been implemented in similarly structured low-carbon fuel regulations in other countries, including Germany.²⁰ Though that analysis recommended a cap of approximately 1.2 billion gallons, lipid-based diesel consumption under the LCFS has already nearly doubled from 2021 levels. Therefore, a cap of approximately 2.3 billion gallons (similar to 2023 consumption levels) could maintain consistency between ARB's modeled scenarios without punishing existing producers.

This cap could be implemented in several ways:

- A) By introducing a separate credit registry for lipid-based fuels and limiting the quantity of credits sold to meet annual LCFS compliance, based on the predetermined volume cap. Developing separate credit registries for different fuel types would be analogous to the trade of Renewable Identification Numbers (RINs) under the federal Renewable Fuel Standard (RFS) program.
- B) By introducing a separate attribute, either energy or volume-based, as an allowance for the blending of lipids in California. Each obligated party would be limited according to the number of allowances they redeem, that represents to the maximum quantity of lipid-based fuel they can blend in a given year. These allowances could be allocated among obligated parties based on the volume of fuel

¹⁶ US EPA, "Renewable Fuel Standard Program (RFS2) Regulatory Impact Analysis," February 2010.

¹⁷ European Anti-Fraud Office, "The OLAF Report 2019," n.d.; U.S. Attorney's Office Eastern District of Pennsylvania, "Owners Of Lehigh Valley Companies And Their Engineer Charged In Green Energy Fraud Scheme," December 21, 2015, <https://www.justice.gov/usao-edpa/pr/owners-lehigh-valley-companies-and-their-engineer-charged-green-energy-fraud-scheme>; Eli Moskowitz and Mira Sys, "How Biofuels Scams Have Undermined A Flagship EU Climate Policy," OCCRP, July 4, 2023, <https://www.occrp.org/en/investigations/how-biofuels-scams-have-undermined-a-flagship-eu-climate-policy>.

¹⁸ ARB, "LCFS Pathways Requiring Public Comments," accessed May 8, 2024, <https://ww2.arb.ca.gov/resources/documents/lcfs-pathways-requiring-public-comments>.

¹⁹ Jane O'Malley et al., "Setting a Lipids Fuel Cap under the California Low Carbon Fuel Standard" (Washington, D.C.: International Council on Clean Transportation, 2022), <https://theicct.org/publication/lipids-cap-ca-lcfs-aug22/>.

²⁰ <https://germanlawarchive.iuscomp.org/?p=315>

sold in the California transportation market in by each obligated party in the previous year, or a set quantity of allowances equivalent to the cap could be awarded via auction.

Deliverability of biomethane-derived hydrogen

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Data provided at the April workshop shows that ARB models a high reliance on dairy biomethane-derived hydrogen for its LCFS compliance. We find that by 2030, ARB's most ambitious scenario projects dairy biomethane-derived hydrogen will generate more credits than renewable diesel. The current book-and-claim system within the LCFS allows for indirect accounting of renewable natural gas (RNG) as long as it is injected into the North American natural gas grid. By virtue of the avoided methane emissions credit, this pairs high credit and compliance value with out-of-sector emissions reductions achieved at farms out of state. As a result, a hydrogen producer can purchase credits from an RNG producer, even when there is no direct, exclusive pipeline connection between the two facilities. The modeling does not distinguish between in state and out-of-state projects for dairy biomethane-derived hydrogen, thus making it difficult to determine to what extent future compliance will come from out-of-state projects.

Figure 4 provides an overview of existing dairy biomethane-derived hydrogen pathways certified under the LCFS by location, illustrating that 100% of these pathways in California are sourcing their biomethane from out-of-state digesters.²¹ While the stated benefit of this system is to support hydrogen deployment, this accounting system favors existing fossil-based steam methane reforming (SMR) technologies by pairing them with a tradeable certificate for an out-of-state project. The high policy value for this pathway does not support the technology transition in California to more advanced technologies, such as hydrogen production via electrolysis, which would support emissions reductions in the long term. At present-day LCFS credit values, dairy biomethane-derived hydrogen would generate over \$4 per kg, roughly 3 times the value of zero-CI electrolytic hydrogen produced from renewable electricity which would only generate approximately \$1.50/kg.²²

²¹ California Air Resources Board, "Current Fuel Pathways," n.d., https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/fuelpathways/current-pathways_all.xlsx.

²² Assuming an LCFS credit value of \$75/ton and an EER of 1.9 for the use of hydrogen in heavy-duty vehicle transport. Calculated via the LCFS credit price calculator. <https://ww2.arb.ca.gov/sites/default/files/2022-03/creditvaluecalculator.xlsx>

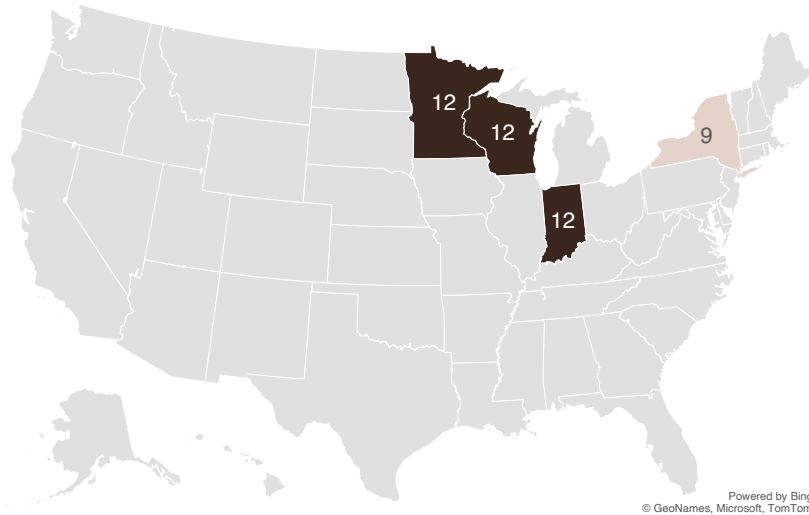


Figure 4: Geographic source of certified dairy RNG projects for hydrogen production in California.

Although deliverability requirements are proposed in the Initial Statement of Reasons (ISOR) released by ARB²³, they would only go into effect after January 1, 2046, for biomethane hydrogen projects that break ground after December 31, 2029. No deliverability requirements will be in effect for the projects that break ground before January 1, 2030.

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cont.

To assess the potential risk to the LCFS, we draw upon data from the recently-published Census of Agriculture²⁴ to identify how many large-scale, centralized farms could be eligible to participate in the program. We chose 2,500 heads of cattle as a cut-off since this number represents profitable digester projects according to our previous assessment.²⁵ Figure 5 below illustrates the geographic distribution of these large farms across the country. Although California is home to around 31% of these farms nationwide, it is evident from the Census that there is a large pool of out-of-state farms (579 total) that could qualify for LCFS credits, though it is not possible to quantify their potential fuel production from the data. The Census data also indicates that California's overall number of dairy farms of this size increased 17% between 2017 and 2022. Although installing digesters is a viable

²³ California Air Resources Board, "Staff Report: Initial Statement of Reasons," December 2023, <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/isor.pdf>.

²⁴ U.S. Department of Agriculture, "Census of Agriculture, 2022 Census Volume 1, Chapter 1: State Level," 2024, https://www.nass.usda.gov/Publications/AgCensus/2022/Full_Report/Volume_1,_Chapter_1_State_Level/.

²⁵ Jane O'Malley, Nikita Pavlenko, and Yi Hyun Kim, "2030 California Renewable Natural Gas Outlook: Resource Assessment, Market Opportunities, and Environmental Performance" (Washington, D.C.: International Council on Clean Transportation, May 22, 2023), <https://theicct.org/publication/california-rng-outlook-2030-may23/>.

method for methane mitigation, it may not result in overall, absolute emissions reductions if the dairy industry keeps growing in California.

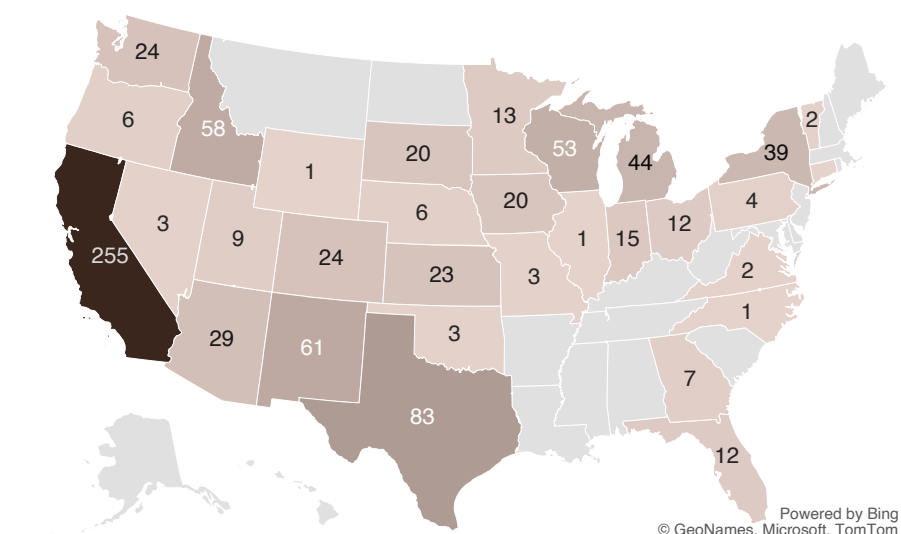


Figure 5: Distribution of dairy farms per state with dairy cattle head greater than 2,500.

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cont.

Out-of-state swine farms capturing biogas could also take advantage of the generous LCFS credits. There are already several certified pathways for swine manure-derived RNG from Missouri being used as an offset for carbon intensity reductions for hydrogen production in California.²⁶ To show the risk from the swine farms, we considered farms with greater than 5,000 heads as cut-off since manure per head is lower for swine, and this is the highest range of data from the Census of Agriculture. Accordingly, there is a total of 3,540 swine farms of this size, and only 2 of them are in California.

Allowing compliance from a broad, nationwide pool of farms also poses risks to the value of LCFS credit markets. Though the higher targets and AAM proposed in the ISOR are intended to lift LCFS credit prices, there is a risk that this goal may be diluted by out-of-sector avoided methane emissions supported by separate policies. For example, dairy digester-sourced RNG procured from outside of California benefits from D3 RINs, which trade at above \$3 per ethanol-equivalent gallon and are insulated from recent price declines for other RIN categories.²⁷ This biomethane may also benefit from next year's 45Z Clean Fuel Production tax credit, which may award a further \$1 per gallon-equivalent. While this is no different from the combination of incentives available for other transport fuels eligible for the LCFS, it does indicate that the viability of these projects—and

²⁶ California Air Resources Board, "Current Fuel Pathways."

²⁷ <https://www.epa.gov/fuels-registration-reporting-and-compliance-help/rin-trades-and-price-information>

therefore, the attributability of avoided methane credits to the LCFS—is not solely attributable to the program and therefore an additional guardrail may be necessary.

In summary, the high compliance value of manure biomethane-derived hydrogen is inconsistent with its contribution to in-state methane reduction goals or transport sector decarbonization. The loose deliverability requirements will do more to facilitate the deployment of digesters in other states, rather than investment in hydrogen conversion technologies in California. The risk of moving forward with loose deliverability requirements is acute; there are hundreds of out-of-state dairy and thousands of swine farms that could take advantage of these incentives.

To mitigate these risks, we recommend that ARB establish a geographic deliverability requirement that connects dairy RNG directly to hydrogen producers in California as soon as possible. Therefore, we recommend that ARB align the deliverability requirements for biomethane used as a hydrogen feedstock with geographic deliverability requirements similar to those required for low-CI electricity to ensure better geographic correlation and focus support on pathways which tangibly reduce emissions in California. A simple geographic deliverability requirement will be more transparent, easier to implement, and is preceded from the deliverability requirements for low-CI electricity. Drawing from an analysis conducted by the U.S. Department of Energy (DOE) for 45V tax credit implementation, we recommend that ARB limit geographic eligibility for biomethane to the states of Washington, Oregon, and California, as this would be roughly consistent with the geographic deliverability for electricity proposed for 45V.⁵⁶ Alternatively, ARB can reference geographic zones from the U.S. natural gas transmission network to set its deliverability boundaries.⁵⁷



May 10, 2024

Liane M. Randolph
Chair
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Via electronic submission

Re: Low Carbon Fuel Standard Workshop and Proposed Amendments, April 10, 2024

Dear Ms. Randolph,

Thank you for the opportunity to share additional feedback with the California Air Resources Board (CARB) following its April 10, 2024, public workshop on proposed regulatory amendments to the Low Carbon Fuel Standard (LCFS).

Ag Processing Inc (AGP) is a leading U.S. agribusiness engaged in soybean processing, refining, and biodiesel production, with a cooperative network representing approximately 200,000 U.S. farmers across five states. While our operations do not extend into California, our products significantly contribute to the state's biofuel supply chain, which supports direct and indirect employment across the region. Our integrated business model underscores a commitment to sustainability, highlighted by the environmental stewardship of our cooperative members and their farmer owners.

At AGP, our sustainability efforts are centered around processing soybeans into value-added products using fewer resources. These initiatives are exemplified by farmers' adoption of climate-smart practices that enhance soil health, preserve water, and improve air quality, often going beyond any regulatory requirement by proactively implementing measures such as no tillage, cover cropping, tree planting, and various edge of field practices. These measures have enabled a 19% reduction in the carbon footprint of U.S. soybeans from 2015 to 2021, alongside a 24% increase in yield and a decrease in chemical and fertilizer application.

109.1

We are increasingly concerned that the ongoing narrative around land use change and deforestation inaccurately groups the American farmers' responsible operations with those in regions like Brazil, where practices do not align with our commitment to environmental stewardship. To this end, we extend an invitation to you and your team to

visit a soybean processing facility in the Midwest to experience firsthand the sustainable measures implemented by AGP and the farmers we serve and support.

109.2 Furthermore, during the April 10 workshop, CARB's analysis rightly recognized that a cap or limitation on crop-based feedstocks is unwarranted as it risks undermining the gains in carbon reduction achieved through biomass-based diesel. This component of California's renewable fuel mix has been instrumental in displacing 60% of fossil diesel, thereby significantly reducing greenhouse gas emissions and pollutants such as PM2.5 and NOx.

109.3 We encourage CARB to adopt a targeted, risk-based approach to sustainability requirements that leverages existing frameworks like the Renewable Fuel Standard (RFS). This approach would support the continued use of low-carbon feedstocks without compromising the growth and sustainability of the biofuels industry, which is vital for achieving California's environmental and air quality goals.

Thank you again for the opportunity to comment and considering our perspectives. We look forward to constructive outcomes from the ongoing dialogue and future LCFS refinements.

Sincerely,



Chris Schaffer
Chief Executive Officer and General Manager
Ag Processing Inc



Raízen Energia S.A.

Av. Brig. Faria Lima, 4100 - Itaim Bibi,
São Paulo - SP, 04538-132

May 10, 2024

The Honorable Liane Randolph
Chair
California Air Resources Board
1001 I Street
Sacramento, CA 95814
(Comments submitted electronically)

Dear Chair Randolph,

We appreciate again the opportunity to comment on the Proposed Low Carbon Fuel Standard Amendments.

In our previous submission dated February 20, 2024, we underscored the pivotal role of the 2024 Rulemaking on Amendments to the LCFS in addressing Sustainability and Certification Requirements for Crop-based feedstocks. Since these were central issues discussed at the April 10, 2024, workshop, we are resubmitting our prior comments for easy reference.

The remaining sections of our February 20, 2024, comments were focused upon carbon intensity (CI), CA-GREET and fuel pathway issues. We would like to express our concern that many of the important carbon intensity reductions that Raízen has integrated into our fuels and facilities in Brazil and that have been recognized in the Carbon Offsetting and Reduction Scheme for International Aviation ("CORSIA") have not yet been recognized within the Low Carbon Fuel Standard ("LCFS") program. We look forward to re-engaging with CARB staff on these critical issues. In particular, we strongly advocate for the incorporation of the second-generation ethanol pathway into Tier 1, along with the following proposed adjustments: 1) revision of the Tier 1 CI Calculator related to N₂O emissions from applied N; 2) making the percentage of unburned mechanized harvesting as a primary data source, supported by evidence; 3) considering the margin of the Brazilian electricity grid when accounting for exported electricity credit; 4) also updating the sugarcane straw yield in the Tier 1 CI Calculator, as made in the CA-GREET 4.0 tool. **Please find the submission from February attached in the Appendix for your reference.**

In addition to the points mentioned above, we would like to express our appreciation for the opportunity to address an additional topic raised during the workshop presented on April 10, 2024. **At the workshop, there was a discussion regarding a possible mechanism to assign higher Land Use Change (LUC) values to high-risk crop-based feedstocks entering the California LCFS Program. Since Brazilian sugar-cane base ethanol had been evaluated by CARB Team in the past, no further analysis is required at this moment.**

Nevertheless, in order to prevent any future misclassification that might consider Brazilian sugarcane as a high-risk crop-based feedstock, this letter aims to underscore why sugarcane is far from being a high-risk crop-based feedstock. The justifications are presented below.

Scientific Evidence Supporting Low-Risk Land Use Change for Sugarcane Ethanol in Brazil

- A study commissioned by the European Commission and conducted by the European Joint Research Centre (JRC)¹ has concluded that sugarcane ethanol production in Brazil presents a low risk of indirect land use change (ILUC)². The key findings regarding sugarcane expansion from 2017 to 2030 are as follows:

110.1 cont.

- **Expansion into other croplands**, including food crops, is also projected to be minimal, **less than 1%**, indicating negligible displacement of farming activities and associated ILUC.
- Approximately **97% of the expansion** is expected to occur on **pasturelands**. Pasture displacement towards northern regions due to sugarcane expansion is possible but **highly uncertain**.
 - Another study conducted by Canabarro et al. (2023)³ reveals that utilizing just 3.1% of the existing Brazilian pasture area, of which approximately 63% exhibits some degree of degradation, could suffice to double ethanol production in Brazil. Hence, intensifying livestock activities and repurposing a fraction of pastureland can notably boost biofuel output without encroaching upon areas designated for food production.
- The JRC study identified an LUC value of 2 gCO₂eq/MJ for sugarcane ethanol production.
- **Expansion into forest** (high carbon stock) and **savannah** native vegetation (Cerrado) is projected to be marginal, **less than 2%**.
- Given its negligible expansion into high carbon stock lands and minimal displacement of other crops, **sugarcane** feedstock production in **Brazil meets** the stringent criteria set by the **EU's environmental standards**.
- In conclusion, the JRC study indicated that **even under** conditions of **high EU demand for ethanol**, which represents a small portion of Brazil's total supply, sugarcane feedstock production would have **limited impacts** on GHG emissions through **LUC**.

- A recent scientific publication (Guarengi et al., 2023)⁴ offers a refined estimation of **direct LUC** associated with **sugarcane cultivation in Brazil**, covering both the Center-South and North regions, spanning the past two decades (2000–2020). This study incorporates changes in management practices and refined assessments of

¹ M. Follador, G. Philippidis, J. Davis, and B. Soares-Filho, *Assessing the impacts of the EU bioeconomy on third countries - Potential environmental impacts in Brazil of UE biofuel demand to 2030*. 2019. doi: 10.2760/304776.

² The goal of the study was to assess the potential impacts on land use changes in Brazil resulting from increased EU demand for ethanol.

³ Canabarro, N. I., Silva-Ortiz, P., Nogueira, L. A. H., Cantarella, H., Maciel-Filho, R., & Souza, G. M. (2023). *Sustainability assessment of ethanol and biodiesel production in Argentina, Brazil, Colombia, and Guatemala*. *Ren and Sust Energy Reviews*, 171, 113019. doi: 10.1016/j.rser.2022.113019.

⁴ Guarengi, M.M.; Garofalo, D.F.T.; Seabra, J.E.A.; Moreira, M.M.R.; Novaes, R.M.L.; Ramos, N.P.; Nogueira, S.F.; de Andrade, C.A. *Land Use Change Net Removals Associated with Sugarcane in Brazil*. *Land* 2023, 12, 584. <https://doi.org/10.3390/land12030584>

land-use carbon stocks. Key highlights include:

- Four different carbon stocks parametrization (A-D) were considered (see Chart below), with variations among them lying in the carbon stock values attributed to planted pasture, sugarcane, and annual crops classes.
 - The study revealed that sugarcane expansion predominantly occurred in severely and moderately degraded pastureland.
 - 98.4% of expansion was over existent agricultural areas (predominantly pasturelands).
- 110.1 cont.
- Sugarcane is primarily produced in the Center-South and Northeast regions, which are geographically distant from deforestation areas.
 - By refining the management practices and carbon stocks of pasture, sugarcane, and temporary crop classes, the emissions associated with land use change (LUC) for sugarcane during the last 20 years shifted from 2.2 TgCO₂.yr⁻¹ (Parametrization A, worst-case scenario) to a pattern of LUC emission removal at -9.82 TgCO₂.yr⁻¹ (Parametrization D, scenario with various management practice improvements).
 - The study also showed that the mechanization of sugarcane harvesting, which changed from 28% in 2007 to 97% in 2020, have been long shown as promising solution to reduce the carbon footprint of Brazilian agriculture.

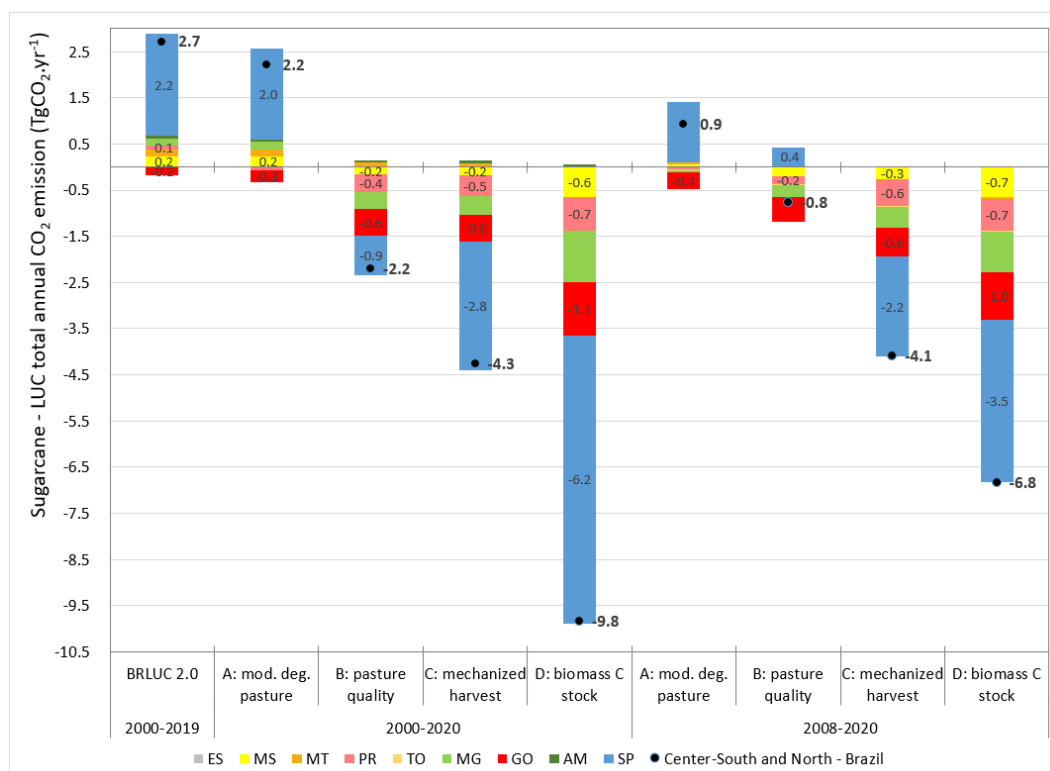


Figure 1. Estimated absolute annual CO₂ emissions from LUCs associated with sugarcane for different parametrizations; from Guarengi et al., 2023⁵. Parametrization A adopts the carbon stock values from BRLUC 2.0⁶ and assumptions include

⁵ Guarengi, M.M.; Garofalo, D.F.T.; Seabra, J.E.A.; Moreira, M.M.R.; Novaes, R.M.L.; Ramos, N.P.; Nogueira, S.F.; de Andrade, C.A. Land Use Change Net Removals Associated with Sugarcane in Brazil. *Land* 2023, 12, 584. <https://doi.org/10.3390/land12030584>.

⁶ Garofalo, D.F.T.; Novaes, R.M.L.; Pazianotto, R.A.A.; Maciel, V.G.; Brandão, M.; Shimbo, J.Z.; Folegatti-Matsuura, M.I.S.

a unique default value for all planted pastures (considering conservatively that all of them are classified as moderately degraded), mechanical harvesting of the entire sugarcane area in the Center-South of Brazil (considering conservatively that nearly 100% of sugarcane harvesting was mechanized in both 2000/2008 and 2020), and default biomass carbon stock values for sugarcane and temporary crops based on European Commission guidelines. Parametrization **B** considers pasture quality levels to calculate a new pasture carbon stock value, using spatially explicit data from MapBiomass Collection 8.0, while maintaining other values from Parametrization A. Parametrization **C** adopts the same assumptions as Parametrization B, with variations in the dynamics of mechanically harvested sugarcane over the analyzed years (2000–2008–2020) and among Brazilian states/regions. Parametrization **D** builds upon Parametrization C by updating sugarcane biomass carbon stock based on fresh yield data from Embrapa Environment studies and assuming carbon stock values for temporary annual crops from IPCC guidelines. This Parametrization includes pasture quality levels, variations in mechanized harvesting, refinement of sugarcane biomass carbon stock, and adoption of carbon stock values for annual crops from the IPCC. The parametrization D results shows that in the period 2000-2020 (-9.8 TgCO₂.yr⁻¹), the increases in carbon stocks in areas with sugarcane cultivation were essentially due to the advance of sugarcane over pasture areas, responsible for 54.6% of gross removals, which was followed by the contribution of transition to raw sugarcane (16.4%), temporary crops (15.0%), and mosaic (13.7%). So, land use change pattern associated with sugarcane expansion predominantly over degraded pastures was essential to contribute to removal emissions.

- A recent publication from the U.S. Department of Energy, pertaining to Section 40B of the Inflation Reduction Act (IRA), has estimated that sugarcane-based Sustainable Aviation Fuel (SAF) production, at a volume of 1 billion gallons per year, results in an indirect emission impact of ca. 5.9 gCO₂eq/MJ. While the estimation primarily addresses SAF demand and **indirect effects**, this figure suggests a relatively low impact of Land Use Change for sugarcane ethanol in Brazil. Notably, this value is lower than the projection of Land Use Change under the LCFS Program, which stands at 11.8 gCO₂eq/MJ.

110.1 cont.

Renovabio: Brazil's Biofuel Policy and Its Deforestation Prevention Requirements

The Brazilian Biofuels Policy, Renovabio, is designed to stimulate the production and distribution of biofuels in Brazil, with the goal of decarbonizing the energy sector and fulfilling the country's climate obligations. Renovabio serves as a **legal mechanism** aimed at **mitigating deforestation** for the cultivation of feedstocks used in biofuel production, **thereby reducing the risk of land use change**. Two crucial prerequisites support the notion that deforestation-related land use change is unlikely to occur:

- Renovabio's environmental requirements **prohibit** the cultivation of biofuel **feedstocks** on **lands converted** from **forest after December 2017**.
 - The Brazilian sugarcane Agroecological Zoning points out 64 million hectares suitable for sugarcane production, most of them composed by abandoned areas or degraded pastures, with no need for deforestation.
- Operators seeking to participate in the Renovabio Program undergo a rigorous certification process.

In conclusion, Raízen expresses appreciation for the opportunity to participate in the LCFS rulemaking process and collaborate with CARB staff. We are once again eager to engage in technical discussions with CARB's highly qualified team. We anticipate continuing the ongoing dialogue and collaboration to advance these discussions, which we believe will play a crucial role in reducing emissions in the California transport sector.

Sincerely,

Raízen



APPENDIX - Letter submitted in February 2024

Raízen Energia S.A.

Av. Brig. Faria Lima, 4100 - Itaim Bibi,
São Paulo - SP, 04538-132

February 20, 2024

The Honorable Liane Randolph
Chair
California Air Resources Board
1001 I Street
Sacramento, CA 95814
(Comments submitted electronically)

Dear Chair Randolph,

We appreciate the opportunity to comment on the Proposed Low Carbon Fuel Standard (LCFS) Amendments.

Raízen is a company created from an independent Joint Venture with shared control between Shell and Cosan, which operates in the production and sale of sugar, bioenergy and bioelectricity. We have a fully integrated process that involves everything from the cultivation of the sugarcane to the production of sugar and ethanol and the logistics of distribution and marketing of these products. We are currently the largest sugarcane-ethanol producer globally, and a unique holder of second-generation ethanol technology operating in a commercial scale.

We would like to start our comments by recognizing CARB's technical staff's diligent work and willingness to engage with stakeholders in the process of updating the LCFS regulations through this rulemaking.

We continuously seek to manage and improve the carbon footprint of our products by diversifying our renewable energy portfolio, with the objective of delivering decarbonization solutions to the market. We increasingly invest to support the mitigation of climate change and the global energy transition. Markets that aim to decarbonize the transportation sector and have a premium policy related to biofuels, such as LCFS / CARB (Low Carbon Fuel Standard / California Air Resources Board), are naturally of interest to Raízen for the commercialization of our biofuels. We pride ourselves for being a committed stakeholder to CARB's LCFS program for a long time and for always offering reliable and trustworthy data on the ethanol sector in Brazil. Raízen has also supplied a significant amount of ethanol to California in recent years.

While acknowledging the advancements that the draft proposal brings, we would like to highlight some points we believe may improve the proposed amendments to the LCFS program.

1. Comments on Sustainability Requirements for Crop-Based Feedstocks (Section 95488.9 (g), Appendix A-1.1)

We understand the pivotal role sustainability certifications play in assuring a fair-trade system combined with sustainable development. Raízen, for instance, has its plants certified by certification schemes, such as Bonsucro and ISCC. Recently, we were the first ethanol producer in the world to be certified with the ISCC CORSIA Plus certification.

In addition to certifications, geographic traceability is maintained for the sugarcane we process, whether sourced from our own operations or from third-party suppliers. This entails the possession of shapefiles delineating the locations of the farms and plots from which we procure or cultivate sugarcane. Our differentiated management of the supply chain enables us to ensure the geographic traceability of our raw materials under the highest sustainability standards in production.

Based on our experience complying with and promoting sustainable practices, we regard such certifications (RSB, ISCC and Bonsucro) as internationally recognized in this field. Not to mention Renovabio, in Brazil. We would therefore encourage CARB to carefully consider these established certification schemes and taking steps to recognize and align with these respected approaches thus avoiding duplication of efforts and placing additional burdens on companies that intend to have trade flows with the state of California and would need to abide by LCFS' sustainability criteria.

Finally, for tracking crop-based feedstock in the supply chain, Raízen strongly recommends the mass-balance approach, a system widely recognized by sustainability certification schemes. The mass balance approach is widely utilized due to its simplicity, particularly within value chains that involve multiple suppliers. In the mass balance tracking model, materials, or products with a set of specified characteristics are mixed according to defined criteria with materials or products without that set of characteristics. Acknowledging the relevance of international reliable certification schemes, the mass balance approach would require fewer resources for biofuel producers, CARB staff and certification bodies. It also ensures transparency through clear documentation. This approach provides feedstock buyers with greater certainty about the sustainability criteria.

2. Comments on Tier 1 for Second-Generation Ethanol (E2G)

Raízen is the unique holder of second-generation ethanol technology operating at a commercial scale. We have one E2G plant operating since 2018 (Costa Pinto) producing at full capacity (~7,925.161,6 gallons/year), as well one recently delivered new plant under construction and 8 more to be constructed soon. It is important to highlight that the E2G production is entirely bagasse-based, tackling climate change with a less carbon intense fuel compared to conventional biofuels, and bringing disruptive technology, as well providing good local jobs and economic growth.

Looking at this expansion plan and benefits of the second-generation ethanol, Raízen's E2G production will significantly increase during the coming years. **Therefore, we**

strongly advocate for CARB staff to incorporate the second-generation ethanol pathway into Tier 1. Recognizing the hurdles in integrating new pathways, we stand ready to support CARB staff by providing valuable operational data.

3. Comments on Backhaul Energy Intensity (Section II-C, Appendix B)

Raízen echoes Shell's assertion that **the addition of backhaul energy intensity to ocean tankers for Brazilian sugarcane is not a universally applicable condition.** This situation does not apply to ethanol transported from Brazil to the US. Raízen can provide evidence of its trading logistics, as it has done in the past, and is pleased to collaborate with CARB staff again to offer further information.

4. Comments on Tier 1 CI Calculator

Firstly, we want to acknowledge CARB's technical staff for their continued efforts and willingness to collaborate with us in the ongoing process of updating the calculator for sugarcane ethanol. However, CARB is faced with a significant responsibility, one that will influence transportation policy for years to come, not only in the US but also in other jurisdictions across the United States and internationally. We are eager to continue contributing to this endeavor.

As we discussed last year during the amendment process of the Draft Tier 1 Calculator, we would like to reiterate some of our comments regarding the assumptions incorporated in the Tier 1 CI Calculator. **Recognizing the potential challenges faced by CARB staff in reviewing Tier 2 applications, we respectfully propose the integration of the following requests into the Tier 1 calculator.** This strategic enhancement aims to optimize efficiency and mitigate administrative burdens associated with Tier 2 evaluations, aligning with our commitment to facilitating smoother processes within regulatory frameworks.

a. N₂O emissions from applied N

The emission factor for direct N₂O emissions from nitrogen inputs, as previously outlined in CA-GREET 3.0, stood at 0.01 kg-N₂O-N/kg N-fert applied to soils, as sourced from the IPCC (2006). In the current version of the CA-GREET 4.0, this figure has been revised to 0.00895 kg-N₂O-N/kg N-fert based on Wang et. al (2012). But no updated was included in the Tier 1 CI Calculator. Raízen acknowledges the efforts of CARB staff in updating this value in CA-GREET 4.0. Despite this updated science evidence, it is worth noting that this adjustment may still not accurately reflect the Brazilian reality, and **the IPCC generally recommends prioritizing regional data whenever available.**

Carvalho et al. (2021)⁷, in a recent publication, conducted a comprehensive study based on 14 relevant publications reflecting current nitrogen fertilization practices in South-Central Brazil's sugarcane industry. Their research is grounded in data gathered from field studies conducted across 17 experimental sites. Importantly, they meticulously accounted for background emissions of N₂O EF, incorporating

⁷ Carvalho, J. L. N.; Oliveira, B. G.; Cantarella, H.; Chagas, M. F.; Gonzaga, L. C.; Lourenço, K. S.; Bordonal, R. O.; Bonomi, A. *Implications of regional N₂O-N emission factors on sugarcane ethanol emissions and granted decarbonization certificates.* Renewable and Sustainable Energy Reviews, 149 (2021), 111423. <https://doi.org/10.1016/j.rser.2021.111423>

over 86 reported values. Notably, the study encompasses N₂O EFs derived from sugarcane cultivated under green mechanized harvesting, which dominates over 95% of the sugarcane cultivation area in the South-Central region of Brazil.

Carvalho et al. (2021) found the average N₂O-N EF of 0.006 kg N₂O-N/kg N applied, considering all N fertilizer sources, for the sugarcane ratoon, which receives most of the N application of the sugarcane areas, and represents 80% of the sugarcane cycle and 89% of the total amount of N fertilizer consumed considering the entire sugarcane mill. **The EF value recommended by Carvalho is 33% lower than the value proposed by Wang et al. (2012).** The value identified by Carvalho is justified by good drainage properties of the deep Oxisols soils, where sugarcane is commonly cultivated in Brazil.

Hence, the review of in situ N₂O-N EF measurements from sugarcane in Brazil indicates values below the default currently proposed in the CA-GREET 4.0, and notably lower than those observed in many sugarcane areas in other regions worldwide. IPCC (2019) values, used in the current Tier 1 CI Calculator, were primarily derived from studies in Europe (34%), North America (28%), and Asia (19%), with Central-South America contributing with only 6–7% to the dataset. Therefore, does not represent the sugarcane reality in the region.

Raízen strongly recommends that CARB staff consider using the value of 0.006 kg-N₂O-N/kg N-fert for both CA-GREET 4.0 and Tier 1 CI Calculator, reflecting the specific conditions in South-Central Brazil's sugarcane production areas.

b. Unburned Mechanized Harvesting

Mechanized harvesting, which involves unburned methods, dominates the sugarcane harvesting landscape in Brazil's Center-South region, representing more than 95% of the total yield. This assertion is substantiated by both official governmental data⁸ and primary data meticulously collected and audited by Renovabio in 2018 and 2019. Renovabio's findings further affirm the correlation between mechanized harvesting practices and the adoption of unburned methods. However, despite this evidence, the default values in the Tier 1 CI Calculator for sugarcane ethanol indicate a mechanization rate of just 80% in São Paulo state and 65% in other states, including the Center-South region.

As per CARB's request, an analysis utilizing remote sensing data was conducted employing the Mapbiomas-Fire⁹ and UNICA's sugarcane area vectors. Data were processed in the Qgis software. For each sugarcane polygon, the percentage of intersection with the polygon of burned area from Mapbiomas-Fire was estimated. After the geospatial statistics calculations, the results were added to the attribute table of the vector, and state-level statistics were computed. Consequently, the total sugarcane area for 2020 was assessed at 10,280,528.7 hectares, of which 82,847.10 hectares were subjected to burning practices, accounting for less than 1% of the

⁸ Safra cana-de-açúcar, Center-South region: <https://unicadata.com.br/listagem.php?idMn=4>

⁹ MapBiomas. MapBiomas Project - Mapbiomas-Fire Collection 1. 2022. Available at: https://mapbiomas.org/en/colecoes-mapbiomas-1?cama_set_language=en. The Mapbiomas-Fire product was elaborated from mosaics of Landsat Satellite images, with 30 meters of spatial resolution, covering the years from 1985 to 2020, providing monthly and annual data of the burned areas in Brazil. The burned area estimation was carried out using artificial intelligence from machine learning algorithms in the Google Earth Engine platform. The algorithm was trained with samples of burned and non-burned areas, in addition with the burned area product of MODIS sensors (MCD64A1) and hot spots data from INPE.

sugarcane area (**Figure 1**).

Considering the significant influence of this input on the calculator and the industry's substantial efforts to reduce emissions through modern harvesting techniques, **Raízen asks CARB staff to carefully review this information.** The implications of CARB's policies extend beyond California, impacting the wider country and the world. It's crucial that CARB's assumptions regarding mechanized harvesting accurately reflect Brazil's sugarcane production patterns, translating into improved carbon intensity for Brazilian ethanol.

We respectfully urge CARB to consider implementing an option for individual mechanization percentage, supported by evidence, within the Tier 1 CI calculator. If, for any reason, this is not feasible, we kindly request that the staff adjust the default mechanization values for Center-South Brazil to a value no lower than 95%. By doing so, CARB will align input more closely with actual practices.



Figure 1. Intersection from the sugarcane area with the burned areas polygons from the MapBiomas-Fire for the center-south region of Brazil. Sources: Mapbiomas-Fire, Canasat.

c. Electricity Exported Credits

Sugarcane-based electricity in Brazil serves as a valuable supplement to hydroelectric generation, particularly during the dry season when water resources may be limited. Its contribution helps mitigate the need for natural gas- and coal-based electricity generation, thus promoting a more sustainable energy mix. **Raízen strongly recommends that CARB staff consider electricity export credits by acknowledging the displacement of the margin of the Brazilian electricity grid.** This should be based on sugarcane electricity's contribution to total thermoelectric

generation during the dry season in Brazil. This approach allows for the reallocation of energy dispatching primarily during this period, reducing the risk of deficit without worsening water reservoir conditions. Raízen disagrees with CARB's approach, which excludes energy exported in the off-season and fails to consider energy produced by cogeneration from third-party biomass. This can create a "double standard" where the rainy season is used to calculate the national electricity grid average but ignored when CARB excludes export electricity credits generated in the off-season months. Both approaches significantly impact the carbon intensity (CI) value of ethanol mills in Brazil.

For a more detailed exploration of electricity production and dispatch in Brazil, please refer to **Annex A**.

d. Straw Yield

Raízen greatly appreciates CARB staff's consideration in updating the sugarcane straw yield in the CA-GREET 4.0, reducing it from 0.24 t/t cane (dry basis) to 0.14 t/t cane (dry basis). However, **Raízen identified the need to CARB staff also implement this change in the Tier 1 CI Calculator.** As previously explained, this revised value is widely accepted by the academic community and is being utilized in numerous studies, including the latest versions of the Argonne GREET Model. **We therefore strongly ask CARB to reconsider this value in the Tier 1 CI Calculator.**

Field	Input	Value	Unit	Source
Field Straw Burning	N2O	1.237	g / tonne	CA-GREET3.0
	CaCO ₂	5,200	g / tonne	CA-GREET3.0
	Herbicide	45	g / tonne	CA-GREET3.0
	Pesticide	3	g / tonne	CA-GREET3.0
	N in N2O as % of N in N fertilizer	1.325%		IPCC Tier 1;
	N in N2O as % of N in biomass	1.275%		IPCC Tier 1;
	Straw Yield	0.238	dry tonne/acre of sugarcane	CA-GREET3.0
	Moisture in straw	15%		CA-GREET3.0
	Fraction of Straw Burnt in Field, %	90%		CA-GREET3.0
	Straw Burning Emissions Factor	17,336	gCO ₂ e/tonne cane	CA-GREET3.0
Mechanized Harvesting Credit	Standard (Sao Paulo State)	80%		CA-GREET3.0
	Non-Sao Paulo States	65%		CA-GREET3.0
Land Use Change	Sugarcane	11.80	gCO ₂ e/MJ Ethanol	Table 6, LCFS reg.
	Field Sugarcane Collection to Stack, MDT	2	miles	CA-GREET3.0
Feedstock Transport	Field to Stack Transport Distance (Standard)	0.0	weighted average distance (miles)	Site Specific
	Stack to Fuel Production Facility Distance	0.0	weighted average distance (miles)	Site Specific
	Sugarcane Transport	1.0204	%W/%W	CA-GREET4.0
	Transport Emissions	388.3	gCO ₂ e/tonne-mile	CA-GREET4.0
Return of Filtercake to Field	Filtercake Transport	282.5	gCO ₂ e/tonne-mile	CA-GREET4.0
	Filter Cake Yield and Application Rate	2.87	kg/metric tonne cane	CA-GREET4.0
Mass Allocation of Juice	From Fuel Production Facility to Farms	0.0	weighted average distance (miles)	Site Specific
	Juice Allocated for Fermentation	100.0%	mass fraction of sugarcane for ethanol	Site Specific

Figure 2. Current assumption for straw yield in the Tier 1 CI Calculator for sugarcane ethanol.

In conclusion, Raízen appreciates the opportunity to contribute with the LCFS rulemaking process and with CARB staff. Once again, we would like to put ourselves available for technical discussions with the high qualified CARB staff. We look forward to continuing the ongoing dialogue and collaboration staff to move forward with these discussions that we are certain will contribute to lowering emissions in the California transport sector.

Sincerely,

Raízen

Annex A. The Brazilian Electrical System

The Brazilian Electrical System (National Interconnected System - SIN) is 99% interlinked¹⁰, so virtually all the production and transmission of electricity in Brazil happens in one main grid closely monitored by the National Electric System Operator (ONS), a federal agency responsible for coordinating and controlling operation of the electricity generation and transmission facilities in the SIN under the supervision and regulation of the National Electric Energy Agency (ANEEL). This unique system adopted by the country creates certainty as to what sources contribute to the marginal generation of power. Sugarcane biomass-based electricity in Brazil receives a fixed income to deliver a “package” of energy per year to the grid. Sugarcane biomass receives this fixed income for the energy it produces and declares its Unit Variable Cost (UVC) equal to zero, since cogeneration of sugarcane biomass electricity occurs in order to meet the demand of the sugar and ethanol industry. Wind and solar sources also have a UVC equal to zero. In this way, all the electrical energy these sources produce is made available to the national grid (since the government already paid a fixed income for it).

The procedure varies for thermo-gas sources. In addition to the fixed income they receive for standby readiness, their UVC exceeds zero. This implies that whenever the ONS deploys them, they are compensated for both their fuel expenses and operational costs. In fact, since sugarcane biomass is classified with a unit variable cost equal to zero, the ONS adopts the so-called merit order, where thermal plants from lower to higher operating costs are dispatched in order to meet demand. The ones with lower UVC are the first to be called to meet domestic demand. Since biomass plants have unit variable cost equal to zero, when available (during the sugarcane harvest season), they are the first to be dispatched to the system, without the need for an order from the ONS. Differently from sources like coal, diesel, and natural gas, the generation of energy from sugarcane biomass sources is controlled and dictated by the industrial process itself instead of by order of the national operator.

¹⁰ <https://www.ons.org.br/paginas/sobre-o-sin/sistemas-isolados>



May 10, 2024

Rajinder Sahota
Deputy Executive Officer
California Air Resource Board

Re: April 10, 2024 CARB LCFS Workshop – Comments on Crop-Based Biofuel Sustainability Proposal

Ms. Sahota and LCFS Team,

RPMG Inc. (RPMG) appreciates CARB holding a workshop on the proposed changes to the Low Carbon Fuel Standard regulation (LCFS or Regulation) specifically with an agenda item dedicated to discussing crop-based biofuel 'sustainability'. This workshop was the first opportunity to actively discuss the proposal, even though it is already placed in the 45-day regulatory package and Initial Statement of Reason, or ISOR. The comment period provided should allow for staff to make modifications to the proposal that RPMG suggests below.

RPMG is a biofuel marketing company representing our owner and marketing partner ethanol facilities located throughout the Midwest dedicated to fostering innovation while maintaining the highest level of regulatory compliance, including considerable resources spent on auditing, verification and quality assurance aspects of the LCFS program. RPMG member facilities provide both ethanol and distillers corn oil (DCO) as essential inputs to California's low carbon fuels market in material quantities. These inputs would end up in both the diesel and gasoline liquid transportation fuel pools within the State.

111.1 This proposal regarding crop-based biofuel sustainability directly impacts what we do on a daily basis, and we have concerns on multiple levels that, as currently drafted, this proposal is adding undue complexity, audit burden and cost to managing compliance without producing an environmental benefit or emission reduction. Our comments below address the issues of practicality, regulatory authority, cost, complexity, and process. RPMG's initial comments to the 45-day package focused on the sustainability provisions as written in the proposed regulation amendments¹. Since those initial comments were filed, there have been additional opportunities to hear from staff, management and Board Members. None of this additional contact has altered our perspective that the proposed sustainability provisions need to be rethought, reworked, or preferably removed at this time.

Proposed Provisions are Not Needed for American Agriculture

111.2 In reviewing the September Board Meeting transcript, it was not clear what was being asked of staff other than to provide biofuel 'guardrails'. RPMG supports the decision by the agency to not institute a biofuels 'cap', and recognize the Sustainability Proposal was the alternative choice. The Sustainability Proposal was staff's first attempt to meet the Board's direction. Upon additional discussion with CARB, it was made clear that staff's primary focus was to prevent uncontrolled and unabated land use conversions in the name of the LCFS, especially in forests, grasslands, wetlands and other sensitive ecosystems. If that is truly

111.3

¹ https://www.arb.ca.gov/lispub/comm/iframe_bccomdisp.php?listname=lcfs2024&comment_num=6364&virt_num=100

111.3
cont.

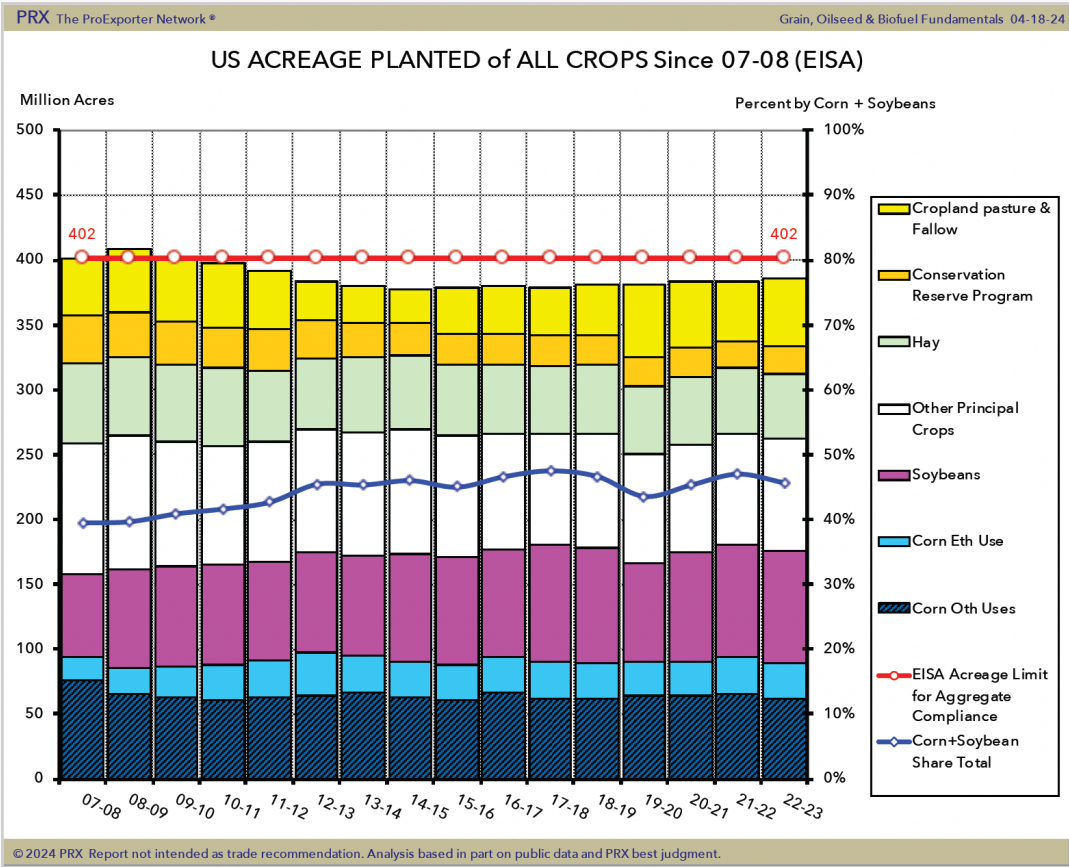
the primary goal, then the first paragraph of the newly added section 95488.9(g) accomplishes that policy concern without the need for the subsequent requirements for the broader, more intensive certification requirements. RPMG believes the following minor additions could cover this issue without the need for the proposed third-party accreditation program.

111.4

“Crop-based and forestry-based feedstocks must not be sourced on land that was converted from forested wetland, grassland (as defined) after January 1, 2008 A forest is as defined in section 95481 or where they are protected by international or national law or by the relevant competent authority for nature protection purposes.”

111.5

It was also noted by some concerned stakeholders in September Board Hearing and April Workshop that the LCFS was driving non-agricultural land into conversion and production, thus diminishing the climate benefits of the Program. The chart below clearly shows this is a false concern for the U.S.



Not only can it be shown that U.S. agricultural acreage hasn't grown, there is already an environmental agency, the U.S. EPA, tasked with tracking this issue of biofuel feedstock production. As set forth in the 2010 RFS regulations, U.S. EPA monitors total agricultural land annually to determine if national agricultural land acreage increases above the 2007 national aggregate baseline of 402 million acres. Based

on data provided by the FSA² and NRCS³ it was estimated that U.S. agricultural land reached approximately 384.7 million acres in 2022, respectively, and thus did not exceed the 2007 baseline acreage. The National Corn Growers Association data also shows that rising U.S. corn yields have boosted production without the use of additional land resources.⁴ Alternatively stated, agricultural land decreased over that time span. Similar work is done by the Canadian Farm Environmental Management Survey, FEMS which demonstrated that agricultural land is not expanding⁵.

Essentially important is further understanding since 1985, the United States Department of Agriculture has been required to ensure that farmers meet specific conservation requirements on their lands in order to be eligible for federal farm programs administered by USDA's Farm Service Agency (FSA), Risk Management Agency (RMA), and Natural Resource Conservation Service (NRCS). Known as "conservation compliance," Congress wanted to ensure that federal farm programs did not entice farmers to grow crops on highly erodible lands or convert wetlands for agricultural production. Farmers who fail to abide by these rules are ineligible for federal farm programs including FSA loans and disaster assistance payments; NRCS and FSA conservation benefits; and Federal crop insurance support.

USDA's Farm Service Agency and Natural Resource Conservation Service are tasked with ensuring eligibility. Leveraging nearly 10,000 staff in state and county offices NRCS is responsible for making the technical determinations of compliance at the farm level and FSA's staff of nearly 7,000 state and county offices use this information to make program eligibility determinations for the covered programs.

USDA has 40 years of experience enforcing these provisions. Under federal regulation, farmers and affiliated person must affirmatively attest (form AD-1026) that they will not plant or produce an agricultural commodity on highly erodible land without following an NRCS approved conservation plan or system; plant or produce an agricultural commodity on a converted wetland; or convert a wetland which makes the production of an agricultural commodity possible. Additionally, activities that may affect compliance such as removing fence rows, combining fields, or conducting drainage activities must be pre-approved by USDA to ensure compliance. US domestic farmers understand and accept this established system. RPMG highly encourages CARB to consider relying on and leveraging this pre-established system and its dedicated resources to recognize established sustainability criteria and verifiable accountability.

Therefore, the whole of North America is shown in an auditable way to not be in an unabated conversion scheme of sensitive land for the purpose of biofuel feedstock production for the California LCFS. If it is really staff's, or the Board's, desire to protect against international land conversion, such a scope should be clarified.

² <https://www.rma.usda.gov/en/Fact-Sheets/National-Fact-Sheets/Conservation-Compliance-Highly-Erodible-Land-and-Wetlands>

³ <https://www.nrcs.usda.gov/getting-assistance/financial-help/conservation-compliance-for-highly-erodible-land>

⁴ <https://ncga.com/stay-informed/media/the-corn-economy/article/2023/09/rising-u-s-corn-yields-boost-production-without-additional-land>

⁵ <https://www150.statcan.gc.ca/n1/daily-quotidien/230217/dq230217f-eng.htm>

Proposed Provisions are Not Well Defined

111.6

Despite the stated goal of this newly drafted section being “Sustainability Requirements”, there is no definition of ‘sustainable’. Compliance is based on “*continuous* certification”, which is again not defined and significantly adds to the costs of the new program. Sustainability is a concept, an important concept, but nonetheless without specificity, regulatory enforcement risk is introduced. RPMG takes compliance seriously and therefore is opposed to new undefined mandates that introduce unknown or unlimited compliance risk.

What is CARB’s scope of this effort? Is it truly to regulate “environmental, social and economic” as currently specified in Section 95488.9(g)(1)(B)(2)? Does it include water quality or water usage metrics? Does it include pesticide toxicity, or application methodologies? On the economic front, does it include fair wages, overtime triggers, or rest break regulation? There is a litany of other possible criteria that fall under the umbrellas of ‘environmental, social and economic’ headings, each with their own nuances, regulatory structure, or acceptable practice-based location, geography, climate, culture, and resources. The list of regulations, requirements and best practices required of an American farmer is extensive⁶. And if it is not CARB’s intent to double check other work, then the certification proposal should be adjusted accordingly.

111.7

Future compliance requirements should not be ‘To Be Determined’, which is how this section is drafted. CARB is attempting to set up a TBD regulatory structure in which the regulatory targets can change in the future without updates to the actual LCFS regulation changing. This runs counter to the Administrative Procedures Act, or APA. The APA requires “clarity” in understanding of regulatory requirements upon adoption.⁷

111.8

As was mentioned in the April workshop, this isn’t CARB’s first attempt at establishing sustainability criteria under the LCFS. Back in the early years of the program start-up, CARB headed down this road but eventually had to forgo any work on this as the breadth of issues were either too broad to manage, outside the authority or scope of CARB, or both. The current proposal of outsourcing the hard and expensive work to stakeholders, verifiers and third-party certification schemes doesn’t solve any of the original problems which caused CARB to focus the program on only carbon emission reductions.

⁶ Including, but not limited to: Clean Air Act, Clean Water Act, Porter-Cologne Water Quality Act, Spill Prevention Control and Countermeasures (SPCC), Facility Response Plan (FRP), National Pollutant Discharge Elimination System (NPDES), Title V permits, NSPS, NSR, Emergency Response planning, Risk Management Program and Plan (RMP), Fair Labor Standards Act in Agriculture

⁷

[https://govt.westlaw.com/calregs/Document/I7E432EB34C6611EC93A8000D3A7C4BC3?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=\(sc.Default\)](https://govt.westlaw.com/calregs/Document/I7E432EB34C6611EC93A8000D3A7C4BC3?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default))

Proposed Provisions are Duplicative Policy

111.9

The LCFS already assigns penalties for high-carbon feedstocks, and already includes a conservative ILUC value on all crop-based feedstock. The ILUC penalty has proven effective at preventing unwanted North American land conversion in life-cycle analysis of feedstocks entering the California market.

Proposed Provisions Outsource CARB's Regulatory Authority

111.10

By allowing a yet-to-be-determined external certification body set the rules of compliance, CARB is setting an incredibly dangerous precedent. No longer will CARB control the very program it is statutorily mandated to implement. The most prevalently used Sustainability certification standards in use at this time were mandated by foreign directives and legal frameworks in other countries, and then developed by non-governmental organizations. RPMG understands the importance of sustainability, but developing a California legally binding requirement overseen by foreign non-governmental organizations and private entities is an abdication of authority. This is a striking departure from CARB's historical position as a global leader in climate policy.

111.11

Through outreach it was further suggested to RPMG that this sustainability certification is akin to the Cap-and-Trade offset program. We note a few important diversions from that perspective. Namely, there are only a handful of allowable offset protocols, each was adopted individually by CARB after a full stakeholder process in California under the APA. As proposed, LCFS stakeholders will be required to comply with a scheme that was approved by CARB's Executive Office and not adopted by CARB's Board.

Proposed Provisions will be Costly to Implement

111.12

The introduction of more certification requirements is tantamount to more "Audit Burden" on stakeholders. CARB has described the LCFS as a voluntary credit generating activity. RPMG would counter that it is actually a binding regulation that requires credit generators to participate. This is clear in the regulation through the differentiation of Opt-In parties and Regulated Entities. Without credit generators, there would be an immediate and crippling lack of transportation fuels in the State.

There has not been any indication or case made that this proposal will result in emission GHG reductions while forcing additional audit requirements upstream to U.S. domestic and global farmers. This additional Audit Burden will only serve to increase costs, time demands, and recordkeeping. Neither the ISOR⁸ nor SRIA⁹ provide an estimate of costs, or an evaluation of cost-effectiveness. It also further exacerbates a distinct increased demand for capable subject matter experts in field, available, and timely accredited auditors. The LCFS is already complicated, this proposal compounds that complexity several fold.

⁸ <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/isor.pdf>

⁹ <https://ww2.arb.ca.gov/resources/documents/low-carbon-fuel-standard-sria>

111.12
cont.

Audit Burden, and stakeholder burn-out, are real issues, especially as clean fuel programs expand in a patchwork fashion across the continent, each with unique requirements. Cost benefit considerations are necessary yet haven't been discussed.

The necessary costs for taking on this additional set of tasks is considerable, and includes but is not limited to:

- 1) Farmer outreach
- 2) Information Technology Upgrades
- 3) Actual certification costs at the feedstock producer level as well as each segment of the traceability supply chain
- 4) Rewriting feedstock purchase contracts, accounting paperwork and regulatory product transfer documents
- 5) Staffing resources
- 6) Staff training cost
- 7) Attorney and Consultant fees
- 8) On-going recordkeeping and program management

These costs can easily result in expenditures greater than \$100,000 per year for a multi-farm, multi-production facility entity like RPMG. This is in addition to annual Third-Party Verification costs already born through the program.

An additional set of questions related to cost and implementability of the provisions relates to pathway approvals, and their interactions with sustainability certification. The proposed language states *"All crop-based and forestry-based feedstocks used for LCFS fuel pathways must meet the following sustainability requirement:"* This leads to additional implementation questions:

111.13

- How will this requirement be applied to Certified pathways in year one proposed for the provision? What initial crop year needs to demonstrate certification for a Certified pathway calculated from two-years of data to be deemed compliant in this provision?
 - Does the CI penalty apply retroactively or to only prospective credit generation?
- How does this requirement apply to Provisional Pathways?
- Does a farm/feedstock location need to be certified prior to application to the LCFS? Prior to certification? Prior to credit generation? Is this requirement now part of a completeness determination?
- What if less than "all" feedstocks used by a facility (who can't control all its suppliers) aren't certified?
 - How would this impact Life-cycle Analysis modeling for total facility output?
 - How would this impact Fuel Pathway Allocation methods and Quarterly Fuel Transaction Reporting?

111.13
cont. RPMG recommends CARB take the time to thoughtfully expound upon these issues and begin the conversation before instituting these requirements. Further, to ensure the implementation schedule is workable for CARB and stakeholders.

Proposed Provisions Ignore the Reality of Biofuel Benefits in Reducing Petroleum Use

111.14 RPMG looks forward to the approval and use of E15 in California. This logical next step for lowering the carbon intensity of California’s gasoline supply will also provide further reduction in criteria air pollutants, thus achieving the dual goals being sought by CARB. Ethanol’s role in California’s gasoline market is firmly established and has been since the mandated phaseout of MTBE. The amount of ethanol used in California is not a function of LCFS incentives, but rather is a function of the State and Federal air quality rules requiring the use of Reformulated Gasoline and an Oxygenate. Under these air quality requirements, there is already a mandate for ethanol that is independent of the LCFS. The LCFS incents lower carbon ethanol *per gallon*, but the existing fuel regulations dictate the *total volume* consumed. It is also important to note that an increased volume of ethanol used in California will not result in an increase of acreage used for feedstock production.

In Closing

111.15 The debate for what constitutes “sustainable” activity or behavior is an important conversation, and should be had for all aspects of LCFS credit-generating activities—as these are all being incented to grow under the LCFS framework.¹⁰ RPMG recommends we take the time to have that conversation before instituting requirements of this magnitude without a full understanding of what the time and cost requirements will be to farmers, producers and the entire supply chain.

111.16 If postponing adoption of this new mandate is deemed an unreasonable ask by staff, then RPMG recommends the new requirements be limited to truly higher-risk feedstocks where the production data isn’t as well defined, reported and already verified. The proposal should be adjusted such that its timing fits in with the pathway compliance cycles, as defined in this rule.

RPMG would like to again highlight the benefits that our industry has made to California’s GHG programs and thank CARB for the opportunity to contribute toward the improvement of this regulatory proposal. We would also reiterate that with a regulatory structure which promotes innovation the biofuels industry can continue to lead the way in terms of reducing the Carbon Intensity of the biogenic liquid fuel market that will remain in the state for years to come. Please contact me with any questions or comments at jwhoffmann@rpmgllc.com.

¹⁰ Including Zero Emission technologies

Thank you,

/s/

Jessica Hoffmann
Regulatory and Compliance Manager
RPMG Inc.

cc: Chair Randolph and CARB Board Members

May 10, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95814

Via electronic submission

Re: Comments on April 10 Low Carbon Fuel Standard Workshop

The American Soybean Association (ASA) appreciates the opportunity to provide additional comments in response to the April 10 Low Carbon Fuel Standard (LCFS) workshop. ASA welcomed the chance to engage with the California Air Resources Board (CARB) throughout the LCFS workshop and rulemaking process and appreciates the work of CARB staff in developing and hosting the most recent workshop.

ASA represents approximately 500,000 U.S. soybean farmers on domestic and international policy issues important to the soybean industry and has 26 affiliated state associations representing 30 soybean-producing states. U.S. soybean growers have long been committed to producing the world's food, feed, fuel, and thousands of bioproducts in a sustainable and climate-smart way.

As CARB revises and refines provisions in the Initial Statement of Reasons (ISOR) package, ASA is pleased to expand on verbal comments provided during the April 10 workshop. Of highest importance is ensuring that sustainability guardrails are workable for the soybean industry. Additionally, ASA continues to request that CARB update soybean land use change modeling that uses 20-year-old data and does not reflect current growing practices. Given the recent federal tax guidance released in April on sustainable aviation fuel, there are also additional opportunities to develop LCFS policies that complement work being done at the federal level rather than create duplicative frameworks that create additional burdens on the biofuels value chain.

Positive Workshop Outcomes

ASA appreciates much of the work that CARB staff highlighted in the April 10 workshop. ASA agrees that the robust public process that CARB has championed throughout the LCFS update work has offered significant opportunities for engagement. The workshop highlighted that liquid fuels will continue to be needed in the transportation sector in California for at least the next decade, and ASA believes the role of soy-based biofuels to lower emissions in today's remaining liquid fuel market is vitally important to help mitigate the impacts of climate change. CARB also noted that the Environmental Justice Advisory Committee's proposed agricultural feedstock cap would result in an increase in petroleum diesel usage. As ASA has noted in previous comments, we appreciate that analysis done by CARB aligns with ASA conclusions in terms of the negative and perverse impacts of an agricultural feedstock cap.

Looking specifically at soybean oil prices and demand, ASA appreciates that CARB explored soybean oil price volatility in recent years and determined that it was not the result of domestic biofuels policy, but instead the result of several factors, including the war in Ukraine, weather, and other market disruptions. Further, CARB dispelled arguments that use of soybean oil for biofuels was impacting food prices and called this argument a "misleading representation" of the interaction between food and fuel.

ASA thanks CARB for their work on this and offers ASA as a resource for additional data related to this in the future.

112.3

ASA also appreciates CARB's additional attention on waste feedstock integrity. Imports of these feedstocks, especially used cooking oil, have exploded in the past couple of years due to incentives in California's LCFS. During much of this period, used cooking oil (UCO) was worth more than virgin palm oil. The increase in U.S. imports of UCO occurred after the EU started investigating fraud allegations as much of the trade was rerouted to the North American market. ASA encourages CARB to verify the integrity of imported UCO used in the LCFS.

Sustainability Guardrails: Exploring Additional Options

While CARB had outlined sustainability guardrails before, this workshop was the first time that staff discussed potential sustainability measures required for agricultural feedstocks in more detail. ASA understands that CARB must balance liquid fuel market demands with environmental sustainability goals in California. However, ASA believes that it is important to work with the biofuels value chain to develop an outcome that is economically and logistically viable for the industry.

112.4

After the April 10 workshop, industries representing soy-based biofuels value chain began conversations to identify sustainability guardrail solutions that may be acceptable to meet CARB's goals. However, finalizing alternative options will take more time. The industry is serious about sustainability criteria that logistically make sense on a commodity-wide scale, but current infrastructure was not developed in a way that inherently supports segregated traceability of sustainability practices at scale throughout the supply-chain.

112.5

Unfortunately, the information provided in the ISOR and presented in the April 10 workshop offer limited explanation as to why sustainability guardrails are required for agricultural feedstocks. CARB workshop slides state despite increasing domestic virgin oil supplies and uncertainty about increases in virgin oil biofuel consumption in California, "Guardrails [are] still warranted to reduce risks of potential impacts from increased demand of virgin oils in CA LCFS and inform other clean fuels program design." It is not clear what risks remain that must be addressed. Total land use change risk is captured by the indirect land use change (ILUC) score penalty through the CARB's Global Trade Analysis Project model for biofuels (GTAP-BIO) model. GTAP defines this "indirect" land use change because it's not part of the "fuel's production, transport, storage and use."¹ Instead, it is through market mechanisms and second effects. In essence, GTAP's ILUC number is not just ILUC, but also includes direct land use change factors. From an aggregate standpoint, whether biofuels were produced from a U.S. acre in production in 2007 or thereafter is largely irrelevant for carbon intensity. The total change in the system is the important component. Simply shifting eligibility among domestic acreage only adds costs without a program benefit.

112.6

It is also not clear what is meant by informing other clean fuels program design. Many other programs already account for land use change. We also are uncertain what role California plays in the regulatory affairs of other jurisdictions. The total land use change in the U.S. for crops cannot exceed late 2007 levels under the federal Renewable Fuel Standard. This provision ensures that total crop acreage in the U.S. cannot expand for biofuels. Furthermore, CARB's GTAP run assumed 812 million gallons of soy-

¹ https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/iluc_assessment/iluc_analysis.pdf

112.6
cont. based biofuels are consumed in state whereas California only consumed 378 million gallons in 2023. Last of all, announcements for crush plant expansion in the U.S. total about a 30% increase in domestic capacity. Even if all of these plants were built, that translates to about 15% of the U.S. soybean crop, and the country currently exports 40 to 50% of the soybean crop.

112.7 Without clearly demonstrated objectives, it remains difficult to devise suggestions for a program. Furthermore, other biofuels feedstocks consumed in California are generally not held to the same standard where they must prove they did not engage in a behavior that is already accounted for in the life cycle analysis. This in practice drives up the costs of agricultural feedstocks compared to other feedstocks and fuels, such as petroleum. In other words, it discourages the use of renewable diesel relative to diesel, which is detrimental to overall GHG emissions. If CARB insists that sustainability criteria for agriculture must be met, it should look to programs already developed through farmer input and provide improved scoring for feedstocks that employ sustainability practices to minimize the changes in comparative costs. Based on the criteria outlined in the workshop and proposed third-party audit scheme, ASA finds the proposal problematic.

Considering Existing Regulatory Requirements and Voluntary Practices

112.10 Importantly, there are considerable regulatory protections and voluntary practices that could serve as an option to satisfy sustainability concerns. There is an international program called the U.S. Soy Sustainability Assurance Protocol (SSAP) which is a tool to verify sustainable U.S. soy production, using audited conservation compliance data to provide global U.S. soy purchasers with assurances that they are purchasing a sustainable product. The SSAP is based on four directives of sustainability, using existing U.S. law as guardrails: biodiversity and high carbon stock; production practices; public and labor health and welfare, and continuous improvement.² ASA believes that while the SSAP is only for use in the international marketplace, it can provide CARB with a sustainability verification roadmap utilizing the existing requirements for U.S. soy production that already meets several United Nations' Sustainable Development Goals and is widely accepted globally, rather than relying on identity preservation throughout the supply chain that could require significant investment and infrastructure build out in limited time. SSAP is utilized by over 90 international procurers and is recognized with global sourcing standards including the European Feed Manufacturers' Federation Soy Sourcing Guidelines, Global Seafood Alliance Best Aquaculture Practices, Tokyo 2020 Olympic Procurement Committee, and SAI Platform's Farm Sustainability Assessment 3.0. Similar aggregated compliance sustainability programs also exist for other biofuel feedstocks and require minimal traceability costs.

112.11 Since 1980, soybean growers have already made significant progress in improving sustainability, with a 43% greenhouse gas emissions efficiency improvement per ton and a 48% land use efficiency improvement in hectares per ton, to name a few. The improvements are not adequately captured in the LCFS as ILUC scores depend on 2004 data.

112.12 As we look at new precision farming technologies, nutrient management, innovations in plant breeding, and growing use of Climate Smart Agriculture practices (CSA), there is no shortage of tools for soybean farmers to continue to build their sustainable farming practices.

² U.S. Soy Sustainability Assurance Protocol, Annual Report 2023

Aligning Sustainability Guardrails with Federal Initiatives

The recent tax guidance³ for sustainable aviation fuel (40B) released by the Internal Revenue Service and Department of Treasury offers insights as to how CARB could offer improved scoring for feedstocks grown employing CSA. The 40B tax credit uses a new GREET methodology (40BSAF-GREET 2024), which shows soybeans offer a 55% emissions reduction, and can improve an additional 5% using limited CSA. The U.S. Department of Agriculture's Climate Smart Agriculture Pilot Program is currently collecting a myriad of outcomes-based data on agricultural improvements from farmers using CSA. Rather than penalizing agricultural feedstocks through an onerous audit system, CARB should consider providing additional emissions reductions to feedstocks employing CSA.

In January, a new Clean Fuel Production Credit (45Z) will go into effect, which ASA hopes will build on the cover crops and no till practices included in 40B. Conservation tillage, crop rotations, sustainable inputs, precision agriculture, and other practices all help produce a more sustainable soybean. Acknowledging the work being done throughout U.S. soybean fields will ensure that CARB does not restrict sustainable feedstocks from its fuel portfolio.

A Critical Need for Stakeholder Engagement

Any agricultural sustainability criteria that CARB establishes will have significant impacts on how the soy industry and biofuels value chain operates. Hosting one workshop that included sustainability concepts did not provide enough of an opportunity for stakeholder engagement on this topic. ASA recommends that CARB convene a working group of industry stakeholders before finalizing sustainability criteria to ensure that the logistical limitations and financial impacts that could result from this policy are properly considered.

Specifically, ASA encourages CARB to convene a working group that includes agricultural feedstock providers, feedstock processors, and biofuels producers to help develop any sustainability provisions that they would be required to implement. This working group should endeavor to flesh out workable sustainability guardrail provisions that CARB can complete by the second quarter of 2025. This would ensure that CARB develop a solution that does not unintentionally limit sustainable lipid-based feedstocks through onerous reporting requirements, while allowing CARB to continue to focus on implementation of the rest of the LCFS update by the end of 2024.

Updating Modeling for Soy Oil Feedstocks

As mentioned in previous comments, ASA is concerned that without a comprehensive update to the GTAP-BIO that CARB utilizes and that relies on 20-year-old data, soy-based feedstocks will be phased out of the LCFS, even though current data indicates a much lower carbon intensity (CI) score. On the one hand, CARB is recommending stringent sustainability guardrails for U.S. soy, but on the other hand is still on track to phase-out soy-based biofuels from credit generation by approximately 2035 or sooner.

CARB is updating all major models for lifecycle emissions calculations except for GTAP-BIO in this rulemaking. As mentioned above, the soy industry has made vast improvements in sustainability and efficiency over the past two decades, with even greater improvement goals ahead. At the same time, CARB continues to rely on a 2014 model that uses data from 2004. The ILUC score accounts for half or

³ Department of Treasury and Internal Revenue Service. Notice 2024-37.

112.14
cont.

more of the CI score for soy-based biofuels. CARB's current modeling assigns soy biomass-based diesel with an ILUC impact of 29.1g CO₂e/MJ whereas updated results from the model used to calculate ILUC scores indicate a value of between 9 and 10 gCO₂e/MJ for soybeans⁴. The recently released 40BSAF-GREET 2024 model has an ILUC score of 12.2 for soy-based sustainable aviation fuel in federal programs. The benefits of the LCFS can only be achieved if CI values are accurately captured. If land use change concerns are large enough to justify sustainability guardrails, then the modeling should also be updated to reflect current land use change data. ASA continues to urge CARB to update its GTAP model to align with other modeling changes being made.

Conclusion

112.15

ASA is encouraged by the continued successes of programs that support the development of cleaner, low-carbon fuels. We appreciate the work that CARB has done to update and improve the LCFS.

However, it is critical that CARB finalizes updates in a way that does not arbitrarily exclude agricultural feedstocks through onerous sustainability guardrails developed without the input of growers.

ASA is eager to continue working with CARB to support the role of agriculture in diversifying the fuel supply and supporting cleaner fuel options in California and beyond. On behalf of U.S. soybean farmers, we appreciate the opportunity to comment and look forward to collaborating with CARB and other relevant stakeholders on implementation of policies that expand the use of soy-based biofuels and market opportunities for soybean farmers.

Sincerely,



Josh Gackle, President
American Soybean Association

⁴ Taheripour, F., Karmai, O., and Sajedinia, E. (2023). *Biodiesel Induced Land Use Changes: An Assessment Using GTAP-BIO 2014 Data Base*. Purdue University

TRANSPORTATION ELECTRIFICATION PARTNERSHIP



May 10, 2024

Honorable Chair Liane Randolph and Honorable Board Members
California Air Resources Board
1001 I Street Sacramento, CA 95814

Subject: Support for Continuing and Evolving California Air Resource Board's Low Carbon Fuel Standard Regulation as a Critical Tool for Meeting ZEV Goals

Dear Chair Randolph and Honorable Board Members,

We write on behalf of the [Transportation Electrification Partnership](#) (TEP) in support of the California Air Resources Board's (CARB) Low Carbon Fuel Standard (LCFS) as a critical tool to advance the state's transition to zero emission vehicles (ZEVs) across the light, medium, and heavy-duty sectors. Since its creation over ten years ago, the LCFS has spurred momentum towards the state's climate goals, as well as Los Angeles' regional goals, reducing greenhouse gas emissions and other air pollutants that disproportionately impact low-income and disadvantaged communities, and the program is needed to continue to advance electric vehicle adoption.

TEP is an unprecedented multi-year, multi-sectoral partnership focused on accelerating transportation electrification in the greater Los Angeles region by 2028, when the world turns its attention to our region as the host of the Olympic and Paralympic Games. Convened by the Los Angeles Cleantech Incubator (LACI), TEP's 25+ members represent a range of stakeholders including local, regional and state government, regulators, utilities, industry leaders, labor organizations and startups. In our Zero Emission 2028 Roadmap, the Partnership set ambitious, but achievable targets for light-duty, medium-duty and heavy-duty ZEV sales as well as charging infrastructure installations to be achieved in LA County by 2028, including:

- 30% of light-duty vehicles on the road and 80% of vehicle sales to be electric, with 129,000 public and workplace chargers to support these vehicles,
- 20% of single occupancy vehicle trips shifted to zero emission public and active transportation,

- 60% of all medium-duty delivery vehicles to be electric, 40% of drayage trucks to be zero emission, and up to 95,000 charging stations deployed to support goods movement.

113.1
cont.

The LCFS program provides a stable source of funding and regulatory support to achieve these goals while growing the green economy in Los Angeles and beyond. It has also served as a key market signal for billions of dollars of investments in zero emission vehicles and infrastructure and will continue to attract large amounts of private capital to the state.

113.2

CARB's Advanced Clean Cars II, Advanced Clean Fleets, and Advanced Clean Trucks rules are spurring zero emission vehicle adoption; extending and strengthening the LCFS program will continue to provide essential support to meet the targets laid out in the regulations. As such, we applaud CARB's proposed 30% reduction in fuel carbon intensity (CI) by 2030 and 90% reduction in fuel CI by 2045, as a means of aligning with greenhouse gas emission caps under SB 32 and AB 1279. Further, we support CARB's pursuit of evolving the LCFS to meet the on-

113.3

going needs of bolstering ZEV sales and the corresponding public and shared-private charging infrastructure buildout for the light-duty, medium-duty and heavy-duty segments of the ZEV market, while maintaining a core emphasis on equity.

For these reasons, we strongly support extending and strengthening LCFS to keep the Los Angeles region and California on track to reach our climate targets and ensure the equitable adoption of ZEVs for all. Please do not hesitate to reach out if you have any questions.

Thank you,

Matt Petersen
President and CEO

Los Angeles Cleantech Incubator (LACI)
Co-Chair, Transportation Electrification Partnership

Drew Murphy
CEO
Edison Energy

Co-Chair, Transportation Electrification Partnership

REMORA

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ADDRESS ECHENEIDAE INC. DBA REMORA
13685 OTTERSON CT
LIVONIA, MI 48150

May 10, 2024

California Air Resources Board
P.O. Box 2815
Sacramento, CA 95812
[submitted electronically]

RE: Comments On Proposed Low Carbon Fuel Standard Workshop on April 10, 2024

Remora values the chance to share input on the April 10, 2024, Low Carbon Fuel Standard (LCFS) Workshop held at the California Air Resources Board's (CARB). We are eager to collaborate with CARB, its State agency partners, and all stakeholders to contribute innovative climate solutions with broad-reaching benefits in California and beyond. We submit these comments in support of a more stringent LCFS program and the swift inclusion of Mobile Carbon Capture Technologies within that program.

About Remora & Mobile Carbon Capture Technology

[Remora](#) designs and manufactures an **innovative engine exhaust technology that captures carbon dioxide (CO₂) directly from hard-to-decarbonize mobile sources**, including Class 8 heavy-duty trucks (semi-trucks), line-haul locomotives, and cargo ships. Using Remora's mobile carbon capture and storage (MCCS) technology, exhaust is diverted to a carbon capture unit, which captures CO₂ emissions, before the exhaust is released into the atmosphere. The captured CO₂ is compressed, stored onboard, and then offloaded at designated sites that are co-located at refueling or cargo-loading infrastructure sites. All captured CO₂ can be safely and permanently disposed of via underground sequestration or utilized within other products and industries.

Mobile carbon capture technologies are uniquely poised to provide major decarbonization benefits while also supporting critical air quality benefits, particularly in heavily impacted communities.

Remora Supports a Strong LCFS

California's transportation sector is the State's largest source of both greenhouse gas emissions (GHG) and air pollution, accounting for more than half of statewide GHG emissions.¹ Rapidly driving down these emissions is a critical element of California's strategy to achieve carbon neutrality. As described in the 2022 Scoping Plan Update, the transition to zero-emission technology will take time as internal combustion vehicles will remain on the roads and in service in California for decades to come. The modeling for the Scoping Plan indicates that even in 2045, significant volumes of liquid fuels, including fossil fuels, are likely to remain in California's transportation fuel mix.² Solutions that can significantly reduce—and even fully eliminate—greenhouse gas emissions from California's transportation sector will be key.

Remora urges CARB to adopt an ambitious step-down and auto-acceleration mechanism that will ensure the program is maximizing emission reductions to drive California towards its climate goals.

LCFS should be positioned to incorporate Mobile Carbon Capture Technologies



Given the scale and scope of the challenge to meet California's GHG reduction targets, the State cannot afford to limit any approaches that can contribute to this effort. As CARB works to refine LCFS, **Remora urges CARB to ensure that it optimally positions California to reap the benefits that innovative and proven technologies like MCCS can provide.**

Incorporating additional technologies into the existing CCS Protocol within the LCFS Regulation, which recognizes the role CCS can play in decarbonizing the production of transportation fuels, will be key.

By incorporating MCCS into the LCFS, California can work towards even more ambitious transportation decarbonization targets, which will provide climate, air quality, and public health benefits to Californians.

Remora appreciates the opportunity to submit comments, and we look forward to continuing to work with you and all stakeholders in California on this critically important effort.

¹ See Draft 2022 Scoping Plan Update, pg. 147.

² See Draft 2022 Scoping Plan Update, pg. 153.

Sincerely,

DocuSigned by:

Paul Gross

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Paul Gross

CEO



May 10, 2024

California Air Resources Board
P.O. Box 2815
Sacramento, CA 95812
[submitted electronically]

RE: Charm Comments on the Low Carbon Fuel Standard Public Workshop on April 10, 2024

Charm Industrial (Charm) appreciates the opportunity to submit comments to the California Air Resources Board (CARB) on the Low Carbon Fuel Standard (LCFS) Public Workshop on April 10, 2024. Charm is a California-based company working in support of state efforts to rapidly drive down greenhouse gas emissions (GHGs) on the path to carbon neutrality. Our innovative negative emissions technology can play a key role in these efforts. We look forward to continuing to work with CARB, its state agency partners, and all stakeholders to deliver innovative climate solutions that will provide benefits in California and beyond.

About Our Technology

Charm has developed a proven carbon dioxide removal technology that has already removed thousands of tons of carbon from the atmosphere. Our innovative approach converts biomass residues into a carbon-rich liquid that is safely and permanently stored underground. Agricultural waste and highly combustible forest residues that would otherwise burn or be left to rot, emitting GHGs into the atmosphere, are instead transformed into a carbon benefit. In addition to the vital climate benefits that negative emissions technologies like bio-oil sequestration provide, our approach delivers critically needed air quality, wildfire resilience, and economic benefits in parts of California that most need them, like the Sierras and the Central Valley.

Charm Supports Strong Carbon Intensity (CI) Targets and a Well Designed Auto-Acceleration Mechanism

115.1

California must build on and accelerate actions to rapidly cut GHGs. These actions must include a robust policy and regulatory framework that will take advantage of the significant benefits that innovative carbon removal and sequestration technologies can deliver, while still prioritizing direct emissions reductions.

Charm appreciates the multiple scenarios presented at the April 10 Workshop for increased step-downs and would encourage CARB to adopt an ambitious step-down as part of its upcoming LCFS update. Charm also supports an auto-acceleration mechanism that functions to increase stringency based on program performance to support critically needed emissions reductions and provide market certainty for ongoing investment in low and zero-carbon technologies. These program updates will ensure that the program is maximizing emission reductions to help achieve California's GHG reduction goals.

115.2

CARB Should Ensure that Additional Technologies are Rapidly Incorporated into the Existing Regulatory Framework for Carbon Removal within the LCFS

Charm can help support the success of an ambitious LCFS program through its proven carbon dioxide removal technology as one part of a suite of innovative technologies that California will need to meet its climate goals. The kinds of solutions that Charm has developed can also play a key role in supporting California's biomass and forest waste management goals, wildfire and forest resilience actions, and air quality goals. As a California-based company, we are invested in helping the state continue to be a climate leader by putting in place policies that pave the way for innovative technologies and solutions to support climate action. Policies that support emerging carbon-negative technologies will ensure continued investment, job creation, and economic growth for California.

Consistent with the necessary and ambitious goals for carbon removal technology detailed in the 2022 Scoping Plan, CARB should ensure that as new carbon dioxide removal and sequestration technologies emerge, they can be quickly incorporated into the existing regulatory framework for carbon removal technologies within the LCFS.

Conclusion

Charm is fully committed to helping California meet its climate goals. California needs a host of strategies to decarbonize virtually every economic sector in the state to achieve carbon neutrality. While we support ongoing efforts to secure direct emission reductions wherever possible, it is clear that innovative carbon removal and sequestration technologies are also going to be needed for California to reach its climate goals, including carbon neutrality by 2045.

Our company was founded to develop and bring technological solutions to the collective effort needed to turn the tide against climate change rapidly. We look forward to continuing to work with CARB on this challenge.

Sincerely,



Nora Cohen Brown
Head of Market Development and Policy



May 10, 2024

Clerks' Office
California Air Resources Board
1001 I Street
Sacramento, CA 95814

SUBMITTED ELECTRONICALLY AT: <https://ww2.arb.ca.gov/public-comments/low-carbon-fuel-standard-workshop-april-10-2024>

Re: April 12, 2024, Workshop on Proposed Amendments to the Low Carbon Fuel Standard ("LCFS")

Rivian Automotive, LLC, ("Rivian") thanks the staff for hosting the April 12, 2024, workshop on the proposed amendments to the LCFS and for providing an opportunity for public comment on the discussion. The workshop covered several important topics, including a review of the crucial role the policy has played in electrifying transportation in California. The LCFS clearly and strongly benefits providers of electricity as a transportation fuel and this is at the heart of Rivian's ongoing support for the regulation and others like it across the country.

- 116.1 However, the workshop did not directly address questions raised by the ISOR regarding the use of residential charging base credits. This is an important aspect of the regulation that merits further discussion. While Rivian finds that the MHD CFR concept has promise, we continue to believe that a
- 116.2 reconstituted LD CFR, administered by automakers, is the highest and best use of base credits. If CARB elects to move forward with the MHD CFR, important questions still need to be settled, including in what amount rebates should be issued. We propose a tiered rebate structure and amounts below.
- 116.3 We also recommend that CARB implement a stepdown greater than 7 percent and take this opportunity to
- 116.4 revise the light-duty ("LD") energy economy ratio and geofencing radius.

Keep the World Adventurous Forever

Founded in 2009, Rivian is an independent U.S. company headquartered in California. With over 16,000 employees across the globe, Rivian's mission is to Keep the World Adventurous Forever. Rivian's focus is the design, development, manufacture, and distribution of all-electric adventure vehicles, specifically pickups, sport utility vehicles ("SUVs"), and commercial vans. Key to the success of our mission, these vehicles will displace some of the most polluting conventional vehicles on the road today.

Rivian brought the first modern electric pickup to market in 2021 when we launched the R1T from our manufacturing facility in Normal, Illinois, followed shortly thereafter by the R1S SUV and the EDV commercial van for Amazon. The R1T and R1S provide all-electric options in segments where added utility is a necessity. The R1T has an EPA-certified range of up to 410 miles. The R1S is certified at up to 400 miles. The truck features 11,000lbs of towing capacity, while the R1S is a seven-passenger full-sized SUV. Both are well-equipped for off-roading in a range of climates. Separately, our Class 2b and 3 commercial vans eliminate tailpipe emissions from last-mile delivery. Rivian is committed to producing 100,000 vans for our

launch customer, Amazon, with more than 13,500 already in service across the U.S. Other fleets are now also deploying Rivian vans in their operations. In March 2024, Rivian revealed future products expanding our vehicle lineup. The R2, coming in 2026, is a five-passenger SUV starting at \$45,000. Looking ahead, the R3 and R3X will expand the Rivian brand into a smaller vehicle form.

Beyond our vehicle lineup, Rivian is also building a network of public DC fast chargers across the country known as the Rivian Adventure Network (“RAN”). More than 14 RAN sites with 84 dispensers are already up and running in California alone.

The Staff Underscored the Significant Value Generated by the LCFS for Transportation Electrification

- 116.5 Rivian appreciates the time spent by staff at the workshop reviewing the benefits of the LCFS for EVs. As an EV manufacturer and charging provider, we strongly support the policy primarily because of what it offers our customers, our business, and our industry as we work to achieve scale and profitability.
- 116.6 That is also why the future of the regulation, as determined by this rulemaking, is so important. We reiterate our prior comments that concluding this process with an ambitious set of amendments in 2024 is crucial for market certainty. We welcome the timeline presented by the staff at the workshop indicating that amendments will go into effect later this year or in early 2025.

Further Discussion of the Future of Residential Base Credits is Necessary

- 116.7 We appreciate that staff had many topics to address in the April workshop and with limited time and significant public interest in other aspects of the regulation, Rivian understands the need to prioritize certain topics. Nonetheless, the ISOR introduced a significant revision to the allocation and use of base credits. Discussion of the proposed changes to base credits in a workshop setting would have been valuable. The previous approach to using base credits has been dogged by significant implementation challenges and, with the CFR now suspended, has unfortunately run into a dead end. There is a genuine debate to be had about the best path forward for this aspect of the regulation.

Even if CARB moves forward with the ISOR proposal, many issues remain open and unresolved—for example, the structure of the MHD rebate program. We offer thoughts on this below. But first, Rivian wishes to reiterate the value of reforming and restoring the LD CFR program as automaker-run incentive.

Awarding Automakers a Greater Share of Base Credits Would Support Implementation of a Reformed LD CFR

- 116.8 In previous comments, workshop input, and engagement with CARB, Rivian has recommended regulatory amendments to allow EV manufacturers to share in base credit generation. Clean fuels policies are intended to be market-based systems that create incentive structures for private sector investments by the providers and users of clean transportation fuels. In the light-duty vehicle sector, the two most important market participants are vehicle manufacturers and their customers. Consistent with the core principles of the LCFS, the policy should encourage the participation of these market actors and reward them for making investments in EVs.

116.8 cont. Rivian’s preferred approach would establish automakers as the priority generators of base residential charging credits. With a sufficiently large allocation of base credits, manufacturers whose vehicles generate such credits (both light- and medium-duty) could operate the Clean Fuel Reward (“CFR”) directly, and more efficiently and sustainably than under the utility-led framework.¹ Since CARB decided to sunset the Clean Vehicle Rebate Project, the CFR would be the last universally available EV purchase incentive in the state—a key tool for sustaining the EV market’s growth into the mainstream of the consumer market.

The auto industry broadly endorses this approach. More detail on how an automaker-administered CFR would be implemented is available in the joint automaker comment letter submitted by the Alliance for Automotive Innovation to the workshop docket. Rivian is a signatory to that letter.

As an Alternative, Rivian Believes the MHD CFR Proposal has Merit—But Discussion of Implementation Details is Needed

116.9 As stated in our comments on the ISOR, allocating non-holdback base credits to a CFR for qualified MHD EVs could be beneficial. As a general proposition, Rivian strongly supports targeting additional incentive dollars at fleet buyers of MHD EVs. However, as we noted previously, many key issues remain unresolved including rebate amounts, how the program would be managed day-to-day, and how the proposed CFR would interact with other incentives.

Rivian proposes the following rebate amounts and tiered structure as a starting point for discussion. If a vehicle is eligible to satisfy ACT or ACF obligations, it should be eligible for the MHD CFR if purchased by a qualifying business, non-profit, or other entity for fleet use.

Class	Rebate Amount
2b-3	\$10,000
4-8	\$40,000
7-8 Tractor	\$80,000

Table 1. As a starting point for discussion, Rivian proposes these rebate amounts and tiered structure for a potential MHD CFR program.

We estimate that LD base credits could annually fund many thousands of rebates in these amounts, sufficient to support all ZEV sales to ACF-exempt fleets statewide.² However, **we request and would welcome staff analysis of various scenarios for the proposed CFR to better inform both Board and stakeholder understanding of what the base credit pool could support.**

116.10 As part of this analysis, we also recommend that staff examine and reconsider the tradeoffs involved in limiting the CFR’s scope. The proposed focus on ACF-exempt fleets is well intentioned but essentially mirrors fleet eligibility restrictions under HVIP. We appreciate that smaller fleets might face relatively

¹ Rivian has previously submitted comments along these lines both individually and in partnership with shared-vision partners. See for example comments submitted by [Rivian](#) and in [coalition](#) with Audi, Tesla, and Bridge to Renewables.

² Rivian estimate based on 38 percent of modeled LD base credit revenue funding rebates in the amounts proposed. Base credit revenue was estimated based on the CI standard, grid CI curve, and credit prices in the Proposed Scenario. Annual ZEV sales to ACF-exempt fleets were assumed to correspond with ACT sales requirements.

greater resource constraints and show a reduced appetite for risk, meaning that policymakers need to consider additional measures to spur the purchase of MHD ZEVs by those operators. But the MHD transition is still in the earliest phases across all fleet sizes and the economics of ZEV purchases remain challenging even for the best-resourced fleets. The ACF regulation will clearly drive many additional ZEV sales, but Rivian believes that providing purchase incentives to all buyers is worthy of consideration. Purchase incentives might encourage fleets to turn their vehicles over more quickly than is required or to over-comply with the Milestone Pathway. At a minimum, Rivian recommends that CARB consider limiting the rebate to ACF-exempt fleets in a later year to account for the delayed implementation of ACF.

CARB Should Implement a Stepdown Greater than 7 Percent

Staff sought feedback on how to approach questions of increased stringency and stepdown percentages.

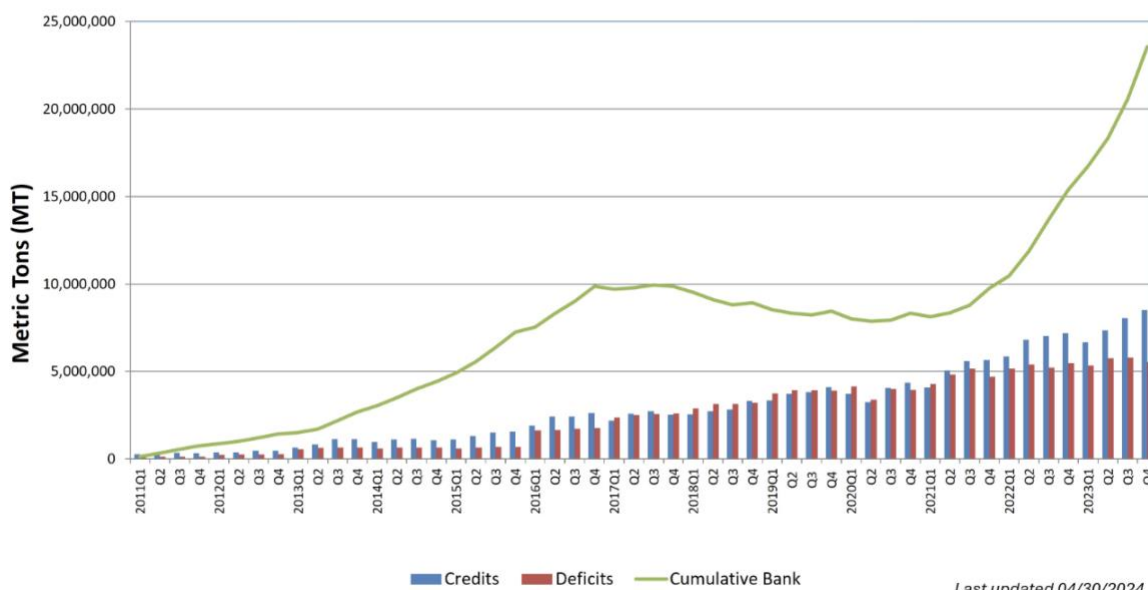
- 116.11 Short-term conditions in the LCFS credit market are a pressing concern for credit generators. EV manufacturers and charging networks like Rivian are on the cusp of rapid growth but currently face a challenging macroeconomic climate. Decisive regulatory action in the short-term to course-correct the LCFS and the credit market is vital for supporting the success of these enterprises.

Responding to the ISOR, Rivian initially argued for a stepdown at least 5 percent. Recent market conditions and data made available for the workshop justify a more substantial adjustment. Indeed, the latest compliance data, model outputs, and staff analysis presented at the workshop lead us now to conclude that even a stepdown of 7 percent is likely inadequate.

As of Q4 2023, the cumulative credit bank stood at approximately 24 million metric tons (“MT”). Moreover, the bank has grown extremely quickly over the past two years.³ Based on the trend since the start of 2020, we estimate that the bank could total almost 35 million MT *by the end of 2024*, immediately preceding the earliest opportunity for regulatory amendments to take effect.

³ California Air Resources Board, *LCFS Data Dashboard*, available at www.arb.ca.gov/resources/documents/lcfs-data-dashboard.

**Total Credits and Deficits for All Fuels Reported and Cumulative Credit Bank
Q1 2011 – Q4 2023**



Source: www.arb.ca.gov/resources/documents/lcfs-data-dashboard.

116.11 Cont. Such a balance would amply accommodate a stepdown of at least 9 percent. The staff analysis presented at the workshop shows that a 9 percent stepdown would force a bank draw of approximately 27 million credits.⁴

Model results made available to the public only underscore our view that the market could support a larger stepdown. For example, the modeled scenarios show consumption of renewable diesel (“RD”)—a major credit generator—falling in the near-term, an outcome that seems extremely unlikely given recent trends in RD consumption. With respect to LD EVs, modeled electricity for 2022-2024 appears lower than we would expect given known EV stocks in those years.⁵ Combined, our review suggests the possibility of greater credit generation than portrayed by the model, with implications for the feasibility of various stepdown scenarios. Stakeholders would benefit from further discussion of the model outputs, their consistency with real-world outcomes, and how they do or do not support various stepdown scenarios.

Overall, we find that the available evidence calls into question whether a stepdown of just 7 percent would sufficiently rebalance the market. Rivian encourages reconsideration of a larger adjustment beginning in 2025.

Revise the EER and Geofencing Radius

116.12 CARB should take this opportunity to propose revisions to the LD EV EER and geofencing radius used to identify eligible residential charging activity. While the ISOR did not include any discussion of potential

⁴ California Air Resources Board, *California Low Carbon Fuel Standard Workshop* (slides), April 10, 2024, available at www.arb.ca.gov/sites/default/files/2024-04/LCFS%20April%20Workshop%20Slides.pdf.

⁵ Rivian estimates of actual electricity consumption based on EV stocks reported by the California Energy Commission, assuming average vehicle efficiency of 0.33 kWh/mi and annual eVMT of 10,000.

116.12 Cont. changes to these aspects of the LCFS, and Rivian did not comment on these issues in our initial comments, with the staff now exploring potential changes to the proposed regulatory amendments we want to take this opportunity to recommend these issues for consideration as part of any 15-Day package.

- **Revise the LD EER.** The current value of 3.4 stems from a determination originally made by CARB in the 2011 rulemaking—and is thus now more than a decade old.⁶ Continuing to use an outdated EER systematically undervalues the real-world displacement of fossil fuels achieved by EVs, and the true role EVs play in decarbonizing the transportation fuel pool in support of the LCFS’ objectives. Examples of more appropriate EER values exist. For instance:

- A National Renewable Energy Laboratory analysis of the U.S. passenger vehicle fleet found an EER of 4.4.⁷
- Canada’s clean fuels regulation specifies an EER of 4.1 for LD vehicles.⁸
- Rivian compared the R1S to comparable three-row internal combustion engine (“ICE”) SUVs and estimated an EER of 4.05.⁹

We encourage CARB to take this opportunity to calculate a revised EER.

- 116.13
- **Update the Geofencing Radius.** To avoid double-counting, CARB currently requires that vehicle charging sessions recorded using telematics that occur within 220m of a non-residential charging station be excluded from reporting for residential incremental credits.¹⁰ As the density of public charging networks continues to increase, a 220m geofencing radius risks excluding a growing share of incremental charging claims. Moreover, contemporary GPS accuracy means that such a generous radius is no longer necessary nor justifiable. Rivian recommends that CARB amend the geofencing radius as part of this rulemaking.

Conclusion

116.14 The LCFS is a powerful policy that, with the right amendments will contribute even more to the state’s efforts to address climate change and electrify transportation. Action is needed to match the policy’s CI reduction requirements with the real-world performance of the clean fuels market. The April workshop opened the door to discussions of a larger stepdown in stringency in 2025. A stepdown greater than 7 percent is necessary. The workshop did not address the future of residential base credits, however, and we believe this important aspect of the LCFS requires more discussion. An automaker-run LD CFR still stands out as the highest and best use of base credits. But if CARB decides to move forward with the MHD CFR concept, implementation details need to be resolved. We propose that vouchers be awarded in the amount of \$10,000 for medium-duty ZEVs, \$40,000 for Class 4-8 ZEVs, and \$80,000 for Class 7-8 tractor ZEVs. As a manufacturer of MHD EVs, Rivian stands ready to support the design and implementation of an

116.15

⁶ California Air Resources Board, *Appendix A: Proposed Regulation Order*, October 26, 2011, available at www.arb.ca.gov/sites/default/files/barcu/regact/2011/lcfs2011/lcfsappa.pdf.

⁷ Mark Singer, Caley Johnson, Edward Rose, Erin Nobler, and Luna Hoopes, National Renewable Energy Laboratory, *Electric Vehicle Efficiency Ratios for Light-Duty Vehicles Registered in the United States*, March 2023.

⁸ Environment and Climate Change Canada, *Clean Fuel Regulations: Specifications for Fuel LCA Model CI Calculations, Version 2.0*, January 2023, p. 85, available at www.data-donnees.az.ec.gc.ca/data/regulatee/climateoutreach/carbon-intensity-calculations-for-the-clean-fuel-regulations/en/Resources/?lang=en.

⁹ Rivian analysis of fuel economy data for a range of ICE vehicles relative to Rivian’s R1S. ICE vehicles examined include the Jeep Grand Wagoneer, Chevrolet Suburban, and Ford Expedition. In all cases, Rivian selected the most fuel-efficient variants of the ICE vehicles.

¹⁰ California Air Resources Board, *Low Carbon Fuel Standard (LCFS) Guidance 19-03: Reporting for Incremental Credits for Residential EV Charging*, June 2019.

116.16 **MHD CFR.** Finally, we urge CARB to take this opportunity to to update the LD EER and geofencing radius for contemporary market conditions.

We are grateful for CARB's hard work and continued engagement with stakeholders throughout this process. Please contact me with any questions. We look forward to further discussions.

Sincerely,

A handwritten signature in blue ink, appearing to read "Tom Van Heeke", is enclosed within a thin black rectangular border.

Tom Van Heeke
Senior Policy Advisor
Rivian Automotive, LLC
641-888-0035 | tvanheeke@rivian.com



May 10, 2024

Liane Randolph
Chair, California Air Resources Board
1001 I St
Sacramento, CA 95814

Re: Comments on Proposed Low Carbon Fuel Standard Amendments, April 10 Staff Presentation
Submitted via CARB's online Comment Submittal Form

Dear Chair Randolph:

Clean Air Task Force (CATF) is pleased to submit comments on CARB's proposed amendments to California's Low Carbon Fuel Standard (LCFS) and questions raised at CARB's April 10th public workshop.

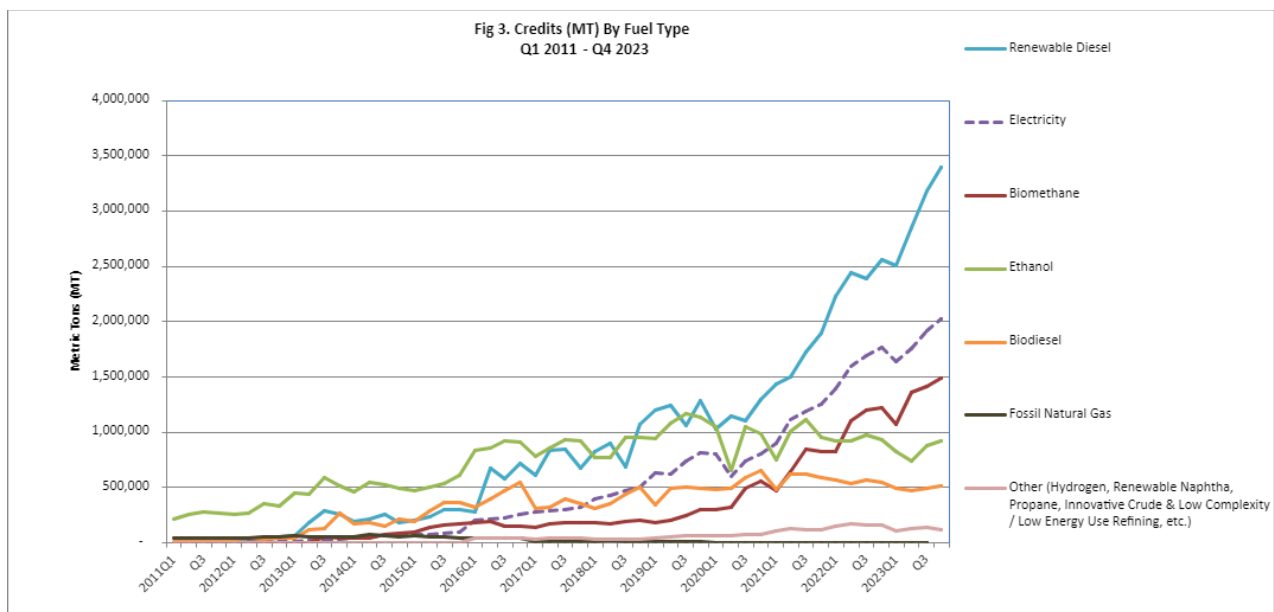
CATF is a global advocacy organization working to safeguard against the worst impacts of climate change by catalyzing the rapid development and deployment of low-carbon energy and other climate-protecting technologies.

- 117.1 We greatly appreciate the additional time CARB staff has invested in considering strengthening the LCFS 2030 targets and proposing the important step of eliminating the current aviation fuel exemption for intrastate fossil jet fuel from the standard, as well as responding to and discussing our and others' concerns with the proposed LCFS revisions during its April 10th public workshop. We do not, however,
- 117.2 believe that the suggested modifications of CARB's proposal sufficiently address the scale of the problem posed by the rapidly growing use of vegetable oil-based fuels, which poses unacceptable risks to food markets and the climate as well as other environmental impacts.
- 117.3 A critical sustainability principle that CARB has expressed at several workshops is that "biofuel production must not come at the expense of deforestation or food production."¹ Without adequate safeguards—which in our view should be some form of binding limit on vegetable oil in California fuel markets, and possibly on waste oils—the California LCFS, one of the largest markets for low-carbon fuels globally, is and will continue to impact food production and cause deforestation. Reiterating our concerns:
- Without adequate safeguards, strengthening and extending LCFS carbon intensity benchmarks will likely accelerate the rapid growth in demand for vegetable-oil based biofuels, directly and indirectly impacting food markets and increasing carbon emissions from land use changes;
 - Including intrastate fossil jet fuel in the LCFS is an important policy signal for decarbonizing the aviation sector, but the current proposal will further increase demand for vegetable-oil based fuels, given that refining and hydrotreating bio-oils is currently the only commercially viable alternative to fossil jet fuel at scale; and
 - The only proposed sustainability requirement for crop-based biofuels, beyond disqualifying palm oil feedstocks, is third-party certification that the feedstocks are derived from land that
- 117.4
- 117.5

¹ Staff presentation, Slide 51 <https://ww2.arb.ca.gov/sites/default/files/2024-04/LCFS%20April%20Workshop%20Slides.pdf>

- 117.5 Cont. has not been forested since 2008, which is too narrowly scoped to serve as an effective constraint on climate-damaging land use change.
- 117.6 To address these concerns, CARB must implement effective sustainability guardrails in this rulemaking process by taking the following actions:
1. CARB must find a way to limit the use of vegetable oil-based fuel in California, which is already impacting domestic and international food markets. Below we suggest one possible method of limiting the share of high indirect land use change (ILUC)-risk vegetable oils used to make biofuels sold into the California market;
 - 117.7 2. CATF supports CARB's consideration that was included in its April 10th workshop slides of extending the sustainability criteria to used cooking and waste bio-oils, given potential substitution impacts (particularly food oil markets) when these waste oils are diverted to fuel markets, and urges their adoption in the final rulemaking package; and,
 - 117.8 3. CARB must assess and report on the sustainability guardrails, including tracking overall compliance of a percentage-based limit (see #1 above) through existing auditing and reporting mechanisms.
- 117.9 ***The Proposed Amendments to California's Low Carbon Fuel Standard Regulation² are likely to further accelerate the already unsustainable growing demand for crop-oil based biofuels.***

While CATF supports CARB's intention to strengthen the LCFS' targets, the lack of adequate safeguards or limitations on crop-oil feedstocks used in producing diesel and aviation fuel will further accelerate an already unsustainable growth in demand for crop-oil feedstocks. According to CARB's reporting, renewable diesel from bio-oils (mostly used cooking oil, tallow, and vegetable oils) are by far the largest and fastest growing source of credits in California's LCFS.³



² [Proposed Amendments to the Low Carbon Fuel Standard Regulation, Appendix A-1, January 2, 2024](#)

³ [Low Carbon Fuel Standard Reporting Tool Quarterly Summaries-Graphs, CARB, October 31, 2023](#)

117.9 Cont. According to the most recently available data, bio-oil based diesel accounted for 68% of the California diesel fuel market as of the fourth quarter of 2023.⁴ Since CARB has tracked feedstock data, beginning in 2021, quarterly use of crop-oil based fuels has grown rapidly to account for 21% of the state's diesel market in 2023.⁵

California demand for Renewable Diesel is unlikely to decline in the 2030s.

During the April 10th public workshop, CARB staff responded to concern about the growing use of crop-oil based renewable diesel fuel by asserting that: a) the supply of renewable diesel produced or imported into the U.S. will exceed future California demand, and b) vegetable-oil based renewable diesel will stop generating credits by the early 2030s, so the risk will be limited.⁶

117.10 CARB also projects that the use of renewable diesel will decline in the future as vehicle standard requirements tighten and the fuel begins generating deficits under the LCFS. CARB's regulatory impact assessment, however, indicates that the *combined* in-state production of renewable diesel and bio-jet fuel alone will increase to more than 800 million gallons by 2040.⁷ Beyond in-state production of bio-oil fuel production, a recent study from UC Davis projects that strengthening California's LCFS reduction target to 30% by 2030 could result in 100% of the state's 3.5 billion gallons of diesel demand being met by bio-based diesel—most of which would be derived from vegetable oils, due to the relatively limited potential of waste-oil supplies.⁸ Such a massive influx of vegetable-oil based diesel fuel would not only pose very large indirect land use impacts and a *potential net increase* in GHG emissions, but could also substantially erode carbon credit prices, which CARB is trying to bolster.

Furthermore, there is no reason the transition from credit-generating to deficit-generating will stop or substantially slow the use of vegetable oil-based fuels relative to fossil diesel. Such fuels will still have a competitive advantage over fossil diesel in the LCFS market, potentially indefinitely, as fossil diesel will generate substantially higher deficits that will be more expensive in the future to retire.

The growth in vegetable oil-based fuels, including in California, is already impacting food markets.

According to the US Department of Agriculture and market analysts, crop-oil based diesel has impacted the soy oil market so significantly that for the first time in history, the U.S. imported more soy oil than it exported.⁹ Soy oil demand for biofuels has grown to an astounding 48% of soy oil use in the U.S. As the dominant market for renewable diesel in the U.S., California's growing demand will draw more global vegetable oil supplies away from existing food markets and into the California fuel market.

These recent trends and CARB's projections underscore the urgent need for careful safeguards in the LCFS amendments. Without adequate safeguards, the strengthening of the LCFS carbon intensity targets

⁴ Calculated from [Low Carbon Fuel Standard Reporting Tool Quarterly Summaries, CARB, October 31, 2023](#)

⁵ Calculated from [Low Carbon Fuel Standard Reporting Tool Quarterly Summaries, CARB, October 31, 2023](#)

⁶ CARB presentation, slides 37-40 <https://ww2.arb.ca.gov/sites/default/files/2024-04/LCFS%20April%20Workshop%20Slides.pdf>

⁷ Standardized Regulatory Impact Assessment (SRIA) of Proposed Amendments to the Low Carbon Fuel Standard Regulation, Table 47, CARB, September 9, 2023.

⁸ [Forecasting Credit Supply Demand Balance for the Low-Carbon Fuel Standard Program, Bushnell et al, UC Davis, August 2023.](#)

⁹ [US shifts to net soybean oil importer on biofuel boom, S&P Global, October 12, 2023.](#)

117.10 combined with the newly proposed Automatic Acceleration Mechanism could greatly accelerate the
Cont. unsustainable growth of crop-oil feedstocks used for making renewable diesel and alternative jet fuel. The resulting and potentially massive increase in demand for crop oil-based fuels markets will contribute to higher food and feed prices, which in turn will accelerate climate-damaging land clearing to accommodate new crop production.

Recommendations

117.11 Given CARB's intention to strengthen and extend the carbon intensity benchmarks of the LCFS program and to obligate intrastate aviation fuels, and considering the unexpected, highly risky, and rapid growth of bio-oil based fuels that will be accelerated by stronger targets and obligating aviation fuels, CATF strongly recommends the following:

1. **CARB must find a way to limit the use of vegetable oil-based fuel in California, at a minimum by limiting the share of high-risk vegetable oils used to make biofuels sold into the California market.**

As explained in our previous comments, the best way to prevent the growth of unsustainable crop-oil fuels is to impose limits on the volume of diesel and aviation fuels sold in the state. Short of imposing volume limits at this time, CATF proposes a two-step process to implement safeguards in the LCFS program: (1) updating the regulation in the current rulemaking to limit the percentage of high ILUC-risk vegetable oil feedstocks (e.g. soy and canola oil) that can be used in the California fuel markets; and (2) in a future rulemaking, imposing volume limits on crop-based fuels.

- A. Step 1: In the current rulemaking, CARB should add safeguards within existing credit generating, reporting and tracking procedures to create percentage-based limitations on crop-oils.

117.12

As CARB staff and other experts have raised, demand for renewable diesel resulting from the LCFS program could have significant impacts on food markets and indirect land use change. CARB must find a way in this current rulemaking process to strengthen the proposed sustainability safeguards to limit vegetable oil feedstocks being drawn into California's fuel markets.

The rapid growth in the use of soy, canola, and other globally traded vegetable oils as biofuel feedstocks poses immediate and significant direct and indirect food and land-use impacts. While a fixed volume limit on all lipid-based fuels would be a more effective way to address this, another approach is to limit the percentage of high ILUC-risk vegetable oil feedstocks (e.g. soy and canola oil) that can be used in the California fuel markets. CARB could achieve this by simply adding a new subsection to limit crop-oil feedstocks, such as:

No more than [20%¹⁰] of the facility's average production yield derived from crop-derived oil feedstocks shall be counted as processed for a fuel pathway and included for credit generation. Crop-derived fuel production exceeding [20%] shall be assigned the same carbon intensity as

¹⁰ Crop-oil feedstocks currently comprise 20% of the diesel fuel sold in California.

117.12 Cont. conventional fossil diesel. Producers must adhere to the reporting requirements set out in 17 C.C.R. § 95491(d)(1)(C) to demonstrate they have met this cap and earn credits.¹¹

As this proposed language indicates with the reference to 17 C.C.R. § 95491(d)(1)(C), the LCFS already requires fuel producers to delineate different feedstocks in their facilities. As a result, the above language could be added as subsection (c) to 17 C.C.R. § 95491(d)(1)(C)(1)—which explains how to calculate the carbon intensity for fuels produced from multiple feedstocks—thereby limiting excessive credits generated from vegetable oils from entering the market in the first place. Current 17 C.C.R. § 95491(d)(1)(C), “Fuel Transactions and Compliance Reporting” provides:

If a fuel production facility simultaneously processes multiple feedstocks, the producer or fuel reporting entity shall associate a portion of the fuel produced with each feedstock, using the production facility’s average production yield and one of the methods provided in section 95491(d)(1)(C). The producer or fuel reporting entity must then label each feedstock-specific subdivision of the total fuel quantity produced with the certified CI associated with that feedstock.

Given that the LCFS already requires feedstock-specific reporting within a fuel facility, CARB could use this reporting mechanism to enforce a new percentage-based limitation.¹² In addition, to ensure this provision captures as much crop-oil feedstocks as possible, CARB should strike “simultaneously” from 17 C.C.R. § 95491(d)(1)(C) where shown above: “If a fuel production facility ~~simultaneously~~ processes multiple feedstocks, the producer.”¹³ Otherwise, fuel producers might be allowed to sidestep this limit by running separate, feedstock-specific fuel production lines.

B. Step 2: In future rulemaking, CARB must consider imposing hard volume caps on crop-based oils in the LCFS.

117.13

Because a percentage-based limit on credit generation will continue to allow substantial growth in the use of crop oil-based fuels and because of wide-spread substitution effects, especially internationally, of using waste oil feedstocks from fuels, a comprehensive framework of safeguards is urgently needed. After adopting an interim limit, such as the one we describe above, we recommend the following:

- Initiate another rulemaking process within one year following the update of the LCFS focused on developing a comprehensive set of safeguards;
- Design an overall limit on lipid-based fuels in the LCFS;
- Analyze the impact of the CA LCFS on the global crop-oil markets, incorporating available data pathway applications and reports; and,

¹¹ If CARB implemented this recommendation, it should also ensure that the requirement is applied to facilities that coprocess petroleum with biomass feedstocks.

¹² CARB should also change the language in § 95488.4(c) from “may” to “shall” to fully enforce this new requirement.

¹³ “simultaneously” is also referenced, and we recommend should be stricken, with regard to coprocessing multiple feedstocks in sections § 95488.4.(c)(1), § 95488.4.(d), § 95491(d).



- 117.14
- Based on this analysis, develop criteria for suspending pathways based on adverse impacts to food markets and ecosystems and removing high-risk feedstocks from LCFS eligibility (as CARB has already proposed to do with palm oil).

We cannot emphasize more strongly that CARB, in this current rulemaking process, find a way to strengthen the proposed sustainability safeguards to limit vegetable oil feedstocks being drawn into California’s fuel markets.

2. Track and report on overall compliance of such a percentage-based limit through existing auditing and reporting mechanisms.

117.15

For the purpose of recordkeeping and auditing (§ 95491.1.), all Fuel Pathway Holders and Applicants are required to retain records on “the quantity of feedstocks purchased to produce the fuel” sold in California “under the certified pathway.” As this data is already tracked and reported in quarterly detail, CARB should be able to track and enforce this new provision within existing protocols. CARB should also assess and report annually the market impacts on crop prices, acreage, and exports that result from diverting bio-based feedstocks to biofuel production and imports obligated under the proposed Sustainability Requirements.

3. Extend the sustainability criteria beyond crop oils to used cooking oil (UCO) and waste oils and assess and report on the sustainability impacts of the pathways.

117.16

We support CARB’s consideration of extending the sustainability tracking requirement to UCO and waste oils. While these feedstocks are preferable to and have lower carbon intensities than crop oils, there are existing markets for these oils that will otherwise turn to crop-based oils when UCO and waste oils are used to produce biofuels for use in California, which also results in land-use change impacts. Furthermore, instances of fraud of crop oils, such as palm oil, being passed off as waste oil have been reported and investigated.¹⁴¹⁵ Given the number of pathways that CARB has approved for imported waste oils, CARB should require 3rd party certification for these feedstocks.

With great appreciation for the tremendous effort CARB staff have invested in developing and proposing important revisions to California’s LCFS, we thank you for your consideration of these recommendations and would be glad to elaborate or discuss these issues further.

Jonathan Lewis
Director, Transportation Decarbonization
Clean Air Task Force

Ashley Arax
Senior California Policy Manager
Clean Air Task Force

¹⁴ [Calls for tighter rules on biofuels imports to root out palm oil fraud, The Guardian, December 14, 2023.](#)

¹⁵ [Suspicious Frying Oil From China Is Hurting US Biofuels Business, Bloomberg News, May 7, 2024.](#)



May 10, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95814

SUBJECT: Low Carbon Fuel Standard Public Workshop, April 10, 2024

Dear CARB staff and Honorable Board Members,

CALSTART appreciates CARB staff's willingness and openness to continue a productive stakeholder engagement process as it relates to the proposed amendments to the Low Carbon Fuel Standard (LCFS). Since its initial implementation in 2011, the LCFS program has decreased carbon in the state's fuel pool, played a significant role in accelerating the use of alternative fuels, and has spurred ZEV infrastructure deployment. The LCFS program is critical to the State's overall air quality, climate, and electrification strategy, as reflected by CARB's 2022 Scoping Plan, which lays out the path for attaining the State's carbon neutrality goals, and explicitly relies on the LCFS program to support electrification.

Comments on April 10 Workshop and Proposed Amendments to the Low Carbon Fuel Standard

CALSTART strongly supports the LCFS program and the proposed amendments, which will expand the benefits of the program to better support medium- and heavy-duty zero-emission vehicles and infrastructure.

118.1

CALSTART appreciates the direction CARB staff is headed based on the April 10th workshop, where staff presented on alternative scenarios that contemplate the benefits of an increased Carbon Intensity (CI) stepdown from the initially proposed 5% to 9%. Increasing the stringency of the program translates into millions of additional tons of greenhouse gas emission reductions and strengthen the market in the process.

While we are glad to see this step in the right direction, we also want to take this opportunity to reiterate some of our initial recommendations, and focus in on issues raised by stakeholders at the workshop relating to the Fast Charging Infrastructure (FCI) provisions.

118.2

As we noted in our 45-Day comments, CALSTART is appreciative of the proposal to expand FCI infrastructure crediting provisions to the medium- and heavy-duty sector, however, there are areas where CALSTART believes the regulation needs additional modification to address grid constraints and best support infrastructure buildout consistent with the State's overarching climate strategy.

Since the release of the initial regulatory proposal, the Joint Office of Energy and Transportation released the National Zero-Emission Freight Corridor Strategy¹, which lays out a plan to prioritize and sequence the deployment of zero-emission medium- and heavy-duty infrastructure in and around key freight hubs and along freight corridors. The

¹ Joint Office of Energy and Transportation, "National Freight Corridor Strategy." [National Zero-Emission Freight Corridor Strategy \(driveelectric.gov\)](https://www.driveelectric.gov)



118.2
cont.

strategy recognizes the need to build out infrastructure near highways, but also the need to buildout infrastructure in key freight hubs. Additionally, RMI recently released an analysis² on drayage truck charging needs, which recommended the strategic dispersal of charging locations further away from ports in order to alleviate port congestion and manage grid constraints as energization costs and timelines remain a barrier for rapid infrastructure buildout. RMI argues, “If stakeholders continue to prioritize installing chargers in these [high concentration] areas, power demand will put considerable pressure on local grids, which will likely not be able to reliably support trucks’ growing charging needs, creating grid bottlenecks... Stakeholders can help relieve the strain on the grid by distributing chargers over a larger area and further away from ports, in places where there is already trucking activity.”

The current LCFS proposal constrains FCI eligibility to projects, “within one mile of a readying or pending electric vehicle Federal Highway Administration Alternative Fuel Corridor or on or adjacent to a property used for medium or heavy-duty vehicle overnight parking, or has received capital funding from a State or Federal competitive grant program that includes location evaluation as criteria.” This restriction is unnecessary as market forces will ensure investors make strategic choices that encourage utilization, and this restriction limits infrastructure providers’ flexibility to align with the National Freight Corridor Strategy and is inconsistent with RMI’s recommendations. CALSTART strongly recommends removing the geographic limitations as we believe this flexibility is needed to deploy charging infrastructure at the pace and scale needed to achieve the State’s air quality and climate goals.

118.3

The proposed regulation also imposes a 10 Fuel Supply Equipment (FSE) per-site cap. This provision limits infrastructure providers’ ability to cost-effectively deploy infrastructure charging hubs consistent with the national strategy. In response to California’s policies to transform the transportation sector via the Scoping Plan and regulations such as Advanced Clean Trucks and Advanced Clean Fleets, the State has seen a growth in the charging-as-a-service (CaaS) business model. These businesses will play a critical role in the transition of the transportation sector and provide important equity benefits by serving smaller sized fleets that may not have their own on-site charging or are unable to install charging due to limitations outside of their control (i.e. They rent their depot/parking space, and the property owner does not wish to invest in the needed infrastructure). Placing a 10 FSE limit on eligibility impacts their business case which requires scale and diversity of chargers. CALSTART recommends that this limitation be eliminated. The power of the FCI provisions in the proposal is to harness and incentivize innovation, creativity, and investment that support a rapid ramp-up in medium and heavy-duty electric vehicles. The artificial constraint for 10 FSEs per site is at odds with the objectives of the Scoping Plan, Advanced Clean Trucks and Advanced Clean Fleets Regulations and should be removed or significantly increased.

Conclusion

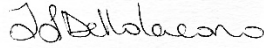
The LCFS program continues to be one of the best drivers to incentivize and promote investments in zero-emission infrastructure. It is a necessary program to ensure the reduction of carbon intensity in the transportation sector while accelerating the adoption of ZEVs. We appreciate all of CARB staff’s work on this regulation to date, and hope to

² RMI, “The Case for Placing Drayage Truck Chargers Away from Ports.” [The Case for Placing Drayage Truck Chargers Away from Ports - RMI](#)



see modifications in the rulemaking as laid out in our comments above, which reflect the needs of the unique CaaS business model and take into consideration grid constraints.

Thank you for your time and consideration. Please feel free to reach out if there are any comments or questions.



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May 10, 2024

Clerk of the Board
California Air Resources Board
P.O. Box 2815
Sacramento, CA 95812

Submitted electronically via: <https://ww2.arb.ca.gov/public-comments/low-carbon-fuel-standard-workshop-april-10-2024>

RE: POET COMMENTS ON APRIL 10, 2024 LCFS RULEMAKING WORKSHOP

Dear CARB Board Members:

POET appreciates the opportunity to provide comments on the recent workshop held to discuss potential refinements to the California Air Resources Board's ("CARB") December 2023 Proposed Low Carbon Fuel Standard ("LCFS") Amendments ("Proposed Amendments"). POET has participated actively in CARB's ongoing rulemaking and submitted detailed [comments](#) on February 20, 2024 regarding the Proposed Amendments. We write now to offer feedback specific to the matters discussed and presented during the April 10, 2024 workshop.

Our continuing concerns with CARB's Proposed Amendments principally relate to the proposed sustainability requirements for crop-based and forestry-based feedstocks. We appreciate CARB's willingness to share more details regarding these proposed requirements during the April 10, 2024 workshop. Unfortunately, the proposed program features that CARB shared in further detail confirm and deepen the concerns we raised in our February 20 comment letter.

- 119.1 Specifically, we remain concerned that the proposed sustainability requirements (1) fail to distinguish between low-risk domestic feedstocks like corn and higher risk oil-based feedstocks that are actually driving policy concerns; (2) ignore sustainability guardrails already in place for
- 119.2 American-grown corn starch ethanol; (3) attempt to regulate social and other non-climate related
- 119.3 factors that lie outside the ambit of AB 32; (4) wrongfully delegate to the European Union and
- 119.4 other third parties the responsibility to establish and certify conformance with sustainability standards; (5) impose costs on bioethanol production that will restrict the supply of bioethanol to
- 119.5 the California market and raise gasoline prices.
- 119.6 POET urges CARB to reconsider and abandon its proposal to impose further sustainability requirements on corn starch ethanol. In the alternative, POET urges CARB to re-evaluate its proposed approach to sustainability requirements and as part of a future rulemaking, and consider crediting for climate smart agricultural practices as a policy to encourage sustainability.

I. CARB's Proposed Sustainability Requirements are Unnecessary As Applied to Corn Starch Ethanol

119.7

As discussed in our written comments submitted on February 20, California has already implemented safeguards that address perceived concerns regarding the potential land use consequences of domestic corn ethanol production. Indeed, California's GREET model imposes an indirect land use change ("ILUC") penalty of 19.8 g/MJ, which is among the highest such penalties imposed in U.S. biofuels programs, and higher than ILUC values reflected in studies conducted since 2015 when California adopted its policy.¹ As POET has commented previously, we believe this ILUC penalty overestimates the land use impacts of domestic corn production. In all events, it is unclear what further perceived environmental harms, if any, would be addressed by additional regulations on domestic corn production as part of the LCFS.

Rather, as Canada's Environment and Climate Change agency ("ECCC") has determined as part of its newly adopted Clean Fuel Regulations, corn production in the United States is already subject to rigorous state and federal environmental laws addressing impacts to air, water, land use and wildlife. For this reason, ECCC has exempted certain U.S. grown crops, including corn, from compliance with additional land use and biodiversity criteria that is otherwise imposed on crop based feedstocks. *See* Clean Fuel Regulations, SOR/2022-140 §§ 53(1), 55(1).² To the extent that CARB continues to believe sustainability requirements are necessary to control for the perceived environmental impacts of certain crop and forestry-based feedstocks, POET urges CARB to adopt Canada's approach to corn starch ethanol, which is well regulated by existing law.

II. The Policy Considerations Apparently Driving CARB's Proposed Sustainability Requirements are Focused on Perceived Effects of Increased Oil-Based Crop Production

The stakeholder feedback that appears to be driving CARB's policy approach is focused on oil based feedstocks. For example, during the workshop on April 10, CARB's presentation devoted several slides to the concerns underlying the proposed sustainability requirements. *See* California Air Resources Board, *California Low Carbon Fuel Standard Workshop*, (April 10, 2024), <https://ww2.arb.ca.gov/sites/default/files/2024-04/LCFS%20April%20Workshop%20Slides.pdf> ("CARB April 10 Workshop"). Each of these slides focused on matters concerning biodiesel, renewable diesel and the oil-based feedstocks necessary to sustain production of these fuel types.

For example, Slide 52 raised the following topics for discussion: "How has crop-based oil seed demand and production changed as biomass-based diesel (BBD) volumes increased?; Does

¹ Notably, the United States Department of Treasury recently adopted a GREET model for purposes of determining qualifying feedstocks for sustainable aviation fuel (SAF) production tax credits. *See* U.S. Department of Treasury, Notice 2024-37, §§ 40B SAF Credit Guidance (April 30, 2024) available at <https://www.irs.gov/pub/irs-drop/n-24-37.pdf>. That model assigned an ILUC penalty of 9.0 CO₂eg/MJ for corn starch ethanol-to-jet-fuel pathways and a total indirect effects penalty of 11.1 CO₂eg/MJ for corn starch based SAF. *See* U.S. Department of Energy Guidelines to Determine LCA using 40BSAF-GREET 2024 at p. 19, Table 3b.

² As discussed in our previous comment, Canada's version of the GREET model also does not impose an ILUC penalty on corn starch ethanol for purposes of calculating the carbon intensity (CI) of fuels participating in the CFR. *See* Canada's Fuel Lifecycle Assessment Model available at <https://www.canada.ca/en/environment-climate-change/services/managing-pollution/fuel-life-cycle-assessment-model.html>.

evidence show that BBD production is increasing cropbased oilseed demand and/or prices?; Is the increase in BBD production resulting in deforestation and/or food system impacts?” *See id.* (Slide 52). Slide 53 focused on trends in biomass based diesel production, noting increases in oil based feedstocks. *Id.* (Slide 53). Slide 54 noted trends in “crop-based oil prices.” *Id.* (Slide 54). Slides 55-56 noted trends in domestic and foreign soy-oil markets. *Id.* (Slides 55-56); Slide 57 summarized the several preceding slides. CARB noted that “biomass-based diesel volumes [are] increasing and likely to increase in the future, given announced capacities” but that “it is uncertain if substantial increases in virgin oil fuel use in California will occur over long-term.” *Id.* (Slide 57). CARB concluded that “guardrails [are] still warranted to reduce risks of potential impacts from increased demand of virgin oils in CA LCFS.” *Id.*

- 119.8 Nowhere in this presentation was corn starch ethanol mentioned as a feedstock of concern that would warrant the imposition of further “guardrails.” Nor was corn ethanol mentioned during the workshop’s public comment period as a feedstock that presented the types of concerns animating CARB’s proposed sustainability requirements. In short, CARB’s proposed sustainability certification program is apparently aimed at solving problems that have not been identified with respect to corn starch ethanol.

Despite corn starch ethanol being absent from CARB’s discussion of feedstocks of concern, the proposed rule’s broad-brush approach treats non compliance by any feedstock, including feedstocks that displace gasoline, by assigning a diesel fuel CI that would result in ethanol having a higher CI than gasoline. POET urges CARB to tailor its proposed policy in a manner that appropriately distinguishes among feedstocks and to refrain from imposing unnecessary and punitive retrictions on corn starch ethanol.

III. The Complexity and Burden of CARB’s Proposed Certifications Will Restrict the Supply of Ethanol to California and Raise the Cost of Gasoline

- 119.9 As POET explained in its written comments submitted on February 20, obtaining sustainability certifications under the proposed rules is likely to be burdensome and costly. CARB’s presentation on April 10 ratified this concern. During the workshop, CARB explained that it “would leverage existing certification programs” such as “ISCC, RBS, REDcert, Bonsucro, etc. (Most already approved under EU Renewable Energy Directive).” CARB April 10 Workshop (Slide 60). CARB elaborated that these certifications would require auditors “perform site visits” to farms during which they would confirm the history of agricultural use on the farm, ensure that “cropping practices” meet as-yet-undefined “sustainability requirements,” “review management systems,” “review social practices (e.g., worker treatment),” “review compliance with all applicable regional, national laws and international laws,” and “review economic stainability of the farm.” *Id.* (Slide 63).

Although some farmers in the United States currently participate in certification programs that require some level on on-farm audting and are paid a premium to do so, this level of scrutiny and regulatory burden is unknown to the vast majority of American corn farmers, who would likely have to make costly changes in their operations meet the requirements of an audit. Many farmers would likely refuse to participate in such a program, and those who might choose to do so would demand premiums that could translate to an increase of several cents per gallon in gasoline prices.

119.9 Cont. Moreover, as POET explained in its February 20 comment, it is not even clear that there are enough qualified certification bodies available to certify the corn supply chain in America by 2028, let alone the supply chains of all other crop-based fuels subject to the proposed sustainability requirements. Completing a multidimensional audit of every LCFS-participating farm by the beginning of 2028 is a complex and likely infeasible task, the consequences of which CARB does not appear to have acknowledged in its rulemaking record. Realistically, significant volumes of crops would not be certified by 2028 even though such sites satisfied whatever substantive sustainability criteria CARB may choose to adopt, resulting in ethanol being treated as a deficit-generating fuel regardless of efforts to comply with the proposed sustainability requirements.

Although POET and other stakeholders previously explained the burdens associated with the proposed certifications, CARB still has not presented any evidence that it has modeled or studied the costs and consequences associated with its proposed certification, nor did it discuss or address any of these challenges during the April 10 workshop.

IV. CARB's Proposal also Suffers Legal Infirmities

A. CARB's Proposal Unlawfully Delegates Substantive Policymaking to the European Union and Third Party Certification Bodies

119.10 The April 10 Workshop confirmed that CARB intends to rely upon ISCC-type certifications that were created to ensure compliance with EU's RED standard. *See* CARB April 10 Workshop (Slide 60) ("CARB would leverage existing certification programs" such as "ISCC, RBS, REDcert, Bonsucro, etc. (Most already approved under EU Renewable Energy Directive)."). In other words, it appears CARB intends to abdicate its role in adopting substantive sustainability criteria and to incorporate into California law standards established by the EU and third party non-governmental organizations. As POET explained in its February 20 comment, this is prohibited under California's non-delegation doctrine.³

B. CARB's Proposal to Incorporate Employment Law and Other Non-Climate Related Criteria into the LCFS Regulations Exceeds the Scope of the Agency's Rulemaking Authority Under AB 32

119.11 AB 32,⁴ the authorizing legislation for the LCFS Program, directs CARB to adopt market-based measures to achieve the GHG reduction goals of the law.⁵ The law does not, however, authorize CARB to establish criteria for participation in the program that are aimed at achieving policy goals outside the ambit of AB 32's climate-related goals. During the April 10 Workshop, CARB showed slides indicating that the agency apparently intends to regulate the "social practices," "management systems," and "economic sustainability" of farms whose crops are sourced as low carbon fuel feedstocks. *See* CARB April 10 Workshop (Slide 63). This type of regulation is ultra vires under AB 32.

³ *Monsanto Co. v. Office of Environmental Health Hazard Assessment*, 22 Cal. App. 5th 534, 556 (5th Dist. 2018) (citing *International Assn. of Plumbing etc. Officials*, 55 Cal.App.4th 251, 254 (3rd Dist. 1997) (holding that legislation violated the nondelegation doctrine when it delegated regulatory determinations to individuals)).

⁴ California Global Warming Solutions Act, Cal. Health & Safety Code § 38500-38599.

⁵ Cal. Health & Safety Code § 38570.

V. CARB Should Consider An Incentive Based Approach to Sustainability

- 119.12 CARB's proposed sustainability requirements present an all-or-nothing mandate for crop-based feedstocks to conform to certain as-yet-undefined standards of sustainability. As discussed above and in our prior comments, POET believes this approach is misguided, and will lead to the unintended consequence of excluding low carbon biofuels and their associated climate and public health benefits from the California market.
- 119.13 As POET has observed in its frequent engagements with CARB over the last several years, agricultural sustainability could be better achieved through clean fuels programming that provides incentives for farmers to adopt climate smart agricultural practices—an approach recently undertaken by the U.S. Treasury Department in its implementation of the Inflation Reduction Act. *See* U.S. Department of Treasury, Notice 2024-37, §§ 40B SAF Credit Guidance (April 30, 2024) available at <https://www.irs.gov/pub/irs-drop/n-24-37.pdf>.

Treasury's recently adopted guidance, aimed at incentivizing the production of sustainable aviation fuel, recognizes that no-till farming, planting cover crops, and applying enhanced efficiency nitrogen fertilizer are all climate smart agricultural practices that help reduce CI for crop-based feedstocks such as corn. *Id.* CARB should consider following the Biden Administration's lead in promoting agricultural sustainability through economic incentives rather than adopting mandates that may undermine CARB's climate goals and lead to unpredictable and unfavorable fuel market consequences.


VI. CARB Should Approve E15 for Sale in California

- 119.14 POET appreciates and agrees with CARB's acknowledgement for the "[p]otential role of E15 to reduce costs at the pump." *See* CARB April 10 Workshop (Slide 66). As California public university research shows, E15 also offers significant climate and public health benefits. Indeed, shifting from E10 to E15 in California would cut annual GHG emissions by approximately 1.8 million metric tons. For these reasons, POET continues to urge CARB to approve E15 for use in California.

CONCLUSION

POET appreciates the opportunity to comment and looks forward to working with CARB to make the LCFS a continued success for California. If you have any questions, please contact me at Josh.Wilson@POET.com or (202)756-5612.

Sincerely,



Joshua P. Wilson
Senior Regulatory Counsel

The Honorable Liane M. Randolph, Chair

California Air Resources Board

P.O. Box 2815

Sacramento, California 95812

RE: California Farm Bureau's Comments Relating to the Proposed Amendments to the Low Carbon Fuel Standard

Dear Chair Randolph,

We appreciate this opportunity to provide feedback on the items discussed at the April 10, 2024, LCFS workshop.

California Farm Bureau (CAFB) is an innovative, service-based organization dedicated to being the foremost advocate, protecting the future and quality of life for all California farmers and ranchers. CAFB protects California's diverse farming and ranching legacy and enables the whole agriculture community to thrive. With over 29,000 members, CAFB is California's largest agricultural association.

California family farmers are community members and are committed to the health and wellbeing of their neighbors. Unlike other economic sectors, the products California's farmers produce are used and *needed* by all Californians. We take great exception to much of the anti-farming, and anti-science rhetoric being offered up at the workshop by representatives of the AB 32 Environmental Justice Advisory Committee and some public comments which are clearly attacks on the agriculture community.

We support continued use of *Avoided Methane Pathways*

120.1 The current LCFS crediting regime for biomethane derived from animal manure is delivering the significant benefits it was designed to achieve. Specifically, the current LCFS crediting incentive for methane capture for transportation fuel use appears to be spurring the development of new digester projects. Since the 2018, LCFS amendments came into effect, the number of digesters has grown from around 20 to more than 100 operating today.

CAFB agrees that reducing methane is the quickest and best way to meet our emissions goals. Avoided methane capture is on track to meet our goals, and LCFS is one critical reason as to our success.

California's digesters have tremendous potential for GHG reductions—targeting methane, a short-lived climate pollutant— and also can reduce other air emissions and improve air quality. Building and operating a manure digester is expensive and the financing of new projects, and continue operation of existing ones, may depend on the continued availability of CI credits in the LCFS program. It is crucial that we continue to send signals to the market regarding the stability and certainty of LCFS.

Manure digesters have the greatest potential to address two overlapping barriers to meeting California's ambitious climate goals: How to reduce methane emissions and how to produce large amounts of RNG needed for zero-carbon transportation and achieving a zero-carbon electric grid. We understand that LCFS is a bridge fuel, and until better options are available, it is premature to reduce support for new and existing methane digesters.

Crop-Based Biofuels Sustainability Criteria

- 120.2 CAFB appreciates CARB's recognition of the critical role that crop-based fuels play in meeting our climate goals. Based on a lack of evidence that the use of crops for fuel feedstocks has negatively impacted public health or food prices, we would argue that the need for a sustainability certification program is premature. However, if there is to be a certification program, we feel that the California Air Resources
- 120.3 Board would be the most appropriate body to develop it, and that Farm Bureau and its members should participate in its development. Included in that endeavor should be a stakeholder process to adequately address the implications that might arise, and the effects that it would have on agriculture, and specifically the certifications for feedstocks that come from climate-smart agriculture.
- 120.4 Additionally, due to California's existing, robust environmental, labor, and land use regulations, we would also argue that any crops or crop wastes produced in California, by California farmers should be automatically considered "sustainable" for the purposes of this program.

We appreciate the complexity of this rulemaking package and staff's dedication to working with all stakeholders to ensure the best possible outcome. We look forward to continuing this conversation.

Sincerely,

Steven Fenaroli

Political Affairs Director, California Farm Bureau

ⁱ <https://ww2.arb.ca.gov/sites/default/files/2020-07/dairy-emissions-matrix-113018.pdf>

May 10, 2024

Ms. Rajinder Sahota
Deputy Executive Officer – Climate Change and Research
California Air Resources Board
1001 I St
Sacramento, CA 95814

Re: Comments on April 10, 2024 LCFS Workshop

Dear Ms. Sahota,

The Renewable Fuels Association (RFA) appreciates the opportunity to comment on the Low Carbon Fuel Standard (LCFS) workshop held on April 10, 2024. The RFA is the leading trade association for America's ethanol industry. Our mission is to drive growth in sustainable renewable fuels and bioproducts for a better future.

The RFA supports the LCFS and looks forward to continued engagement in this process to strengthen and extend the program beyond 2030. The RFA is also working around the country in collaboration with other stakeholders to develop and implement clean fuel programs in other states.

The RFA has commented extensively over the last two years during the California Air Resources Board's (CARB) process of modifying and updating the LCFS program. The comments here are responsive to the latest workshop and should be considered in conjunction with our other comment letters.

The one-time step-down should be increased to nine percent, contingent on a commitment from CARB to begin the regulatory process to approve E15.

121.1 Overcompliance with the LCFS has accelerated and is stifling the innovation necessary for California to meet its climate goal of carbon neutrality by 2045. At the end of 2023, the credit bank was approaching 24 million metric tons, and it has been growing steadily every quarter for the last two years.

The significant imbalance between credits and deficits has chilled the credit market, with credit pricing this month dropping to the lowest levels since July 2015. Delays in finalizing the modifications to the LCFS program are adding to the market uncertainty. Consequently, the long-term market signals necessary for new investments in low-carbon technologies are lacking, undermining the future success of the program.

121.1
cont.

The 45-day rulemaking package for the LCFS included a five percent step-down. The April 10th workshop showed modelling for both a seven and nine percent step-down. A strong one-time step-down in the compliance curve of nine percent, combined with the proposed Auto Acceleration Mechanism, would be the most effective and immediate measure CARB can implement to send the appropriate investment signals and restore confidence in the long-term viability of the LCFS program.

Approval of E15 in California would further reduce carbon emissions, support a more stringent LCFS compliance curve, lower criteria pollutant emissions, and reduce consumer fuel costs.

121.2

The RFA has been actively working with CARB over the last five years on the process for E15 approval. California is now the only state in the country that does not allow the use of E15 as a legal fuel. The Multi-Media Evaluation required by regulation to certify new fuels in California is complete and is awaiting final approval by the Environmental Policy Council.

E15 certification is the single most effective measure CARB can adopt in the transportation sector to immediately and significantly reduce GHG emissions further, while at the same time reducing criteria pollutant emissions and consumer costs. If all gasoline sold in California today were E15 instead of E10, the state would see an additional decrease in GHG emissions of approximately 2 million metric tons per year.

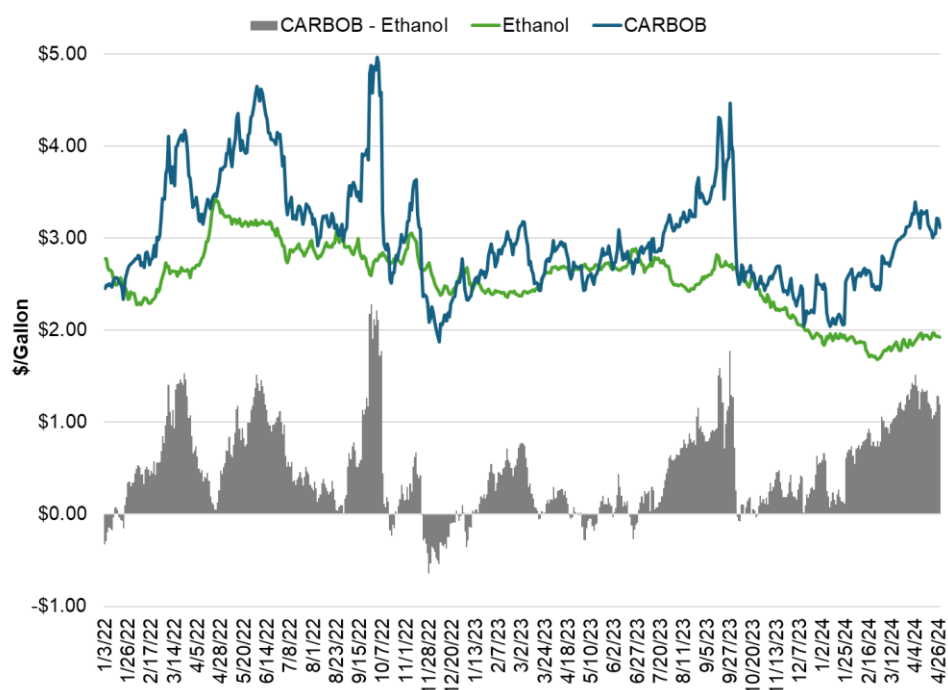
On the cost side, the wholesale price of ethanol in California typically trades at a significant discount to CARBOB, the fuel with which ethanol is blended to make finished California gasoline (Figure 1). In recent months, prices for ethanol sold in California have consistently been \$1 per gallon below the price of CARBOB.

This cost-effective strategy for significant GHG reductions supports a more significant step-down in the LCFS compliance curve while displacing more petroleum and improving public health through lower tailpipe and toxics emissions.

The RFA has been advocating since the beginning of the current LCFS rulemaking for E15 to be a part of this round of program modifications. We appreciate that CARB is now asking for comments on E15 in connection with the April 10th workshop, but since E15 was not part of the 45-rulemaking package we are urging CARB to expeditiously begin a separate rulemaking process to approve E15.

As part of the final LCFS rulemaking, we encourage CARB to include a staff recommendation or a Board resolution to immediately initiate an expedited rulemaking to approve E15 in California. Given the myriad environmental and economic benefits of E15, as well as the time value of near-term carbon reductions, the time to approve E15 in the state is now.

Figure 1: Los Angeles Gasoline Blendstock (CARBOB) vs. Ethanol Prices



Sources: OPIS (ethanol), U.S. Energy Information Administration (CARBOB)

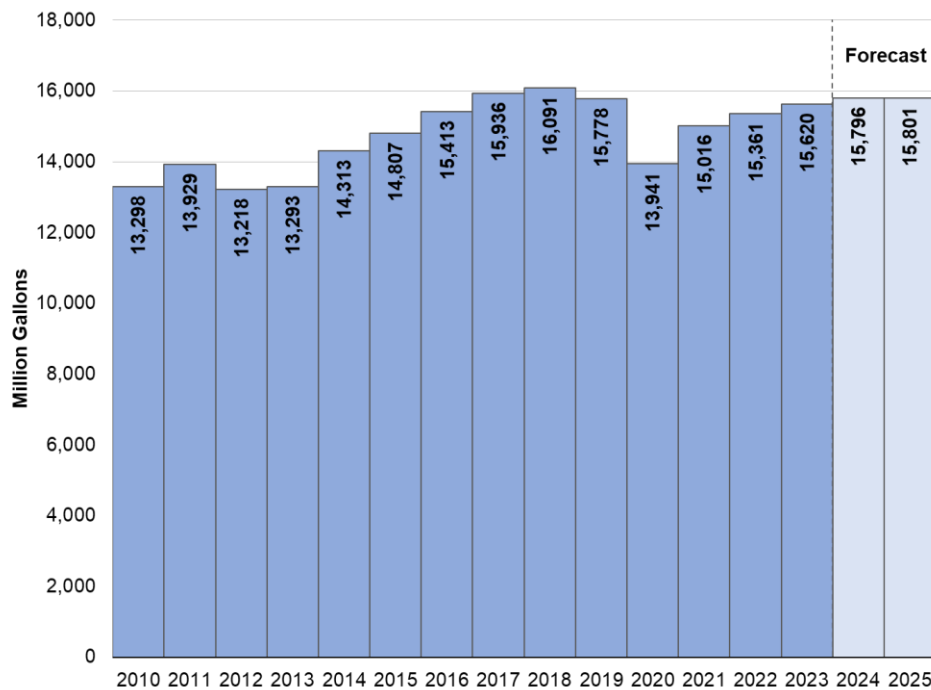
U.S.-produced ethanol already meets the objectives of the proposed sustainability provisions and should not be subject to further certification.

In the Initial Statement of Reasons for the proposed LCFS amendments, CARB provides its rationale for introducing crop-based biofuels sustainability criteria: “To reduce the risk that *rapid expansion* of biofuel production and biofuel feedstock demand could *result in deforestation or adverse land use change*, CARB staff are proposing additional guardrails on the use of crop-based feedstocks for biofuel production.”¹ However, U.S. fuel ethanol production has declined since peaking in 2018, and federal government forecasts do not reflect “rapid expansion,” but rather flat or declining volumes, depending on the timeframe. As a result, there is no risk of associated deforestation or land use change related to U.S. ethanol production.

After reaching 16.1 billion gallons (bg) in 2018, ethanol production slipped to 15.8 bg in 2019 and then fell sharply to 13.9 bg in 2020 as a result of the pandemic, according to the U.S. Energy Information Administration (EIA) (Figure 2). Volumes have recovered somewhat over the last few years, but output was only 15.6 bg in 2023. Moreover, according to EIA’s May 2024 *Short-Term Energy Outlook*, production is forecast to be 15.8 bg in both 2024 and 2025, remaining below the 2017 and 2018 levels. The compound annual growth rate from 2010 to 2025 will have been just 1.2%.

¹ <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/isor.pdf> (emphasis added)

Figure 2: U.S. Fuel Ethanol Production



Source: EIA

The number of vehicle miles traveled in the U.S. has followed a similar pattern over the last five years. Increasing sales of electric vehicles (EVs) and improving fuel economy for vehicles with internal combustion engines have also weighed on ethanol consumption. Trends toward reduced commuting (as people are working from home at least part of the week), higher fuel economy, and expanded EV sales are expected to continue in the future.

Beyond market developments, adoption of EVs will be explicitly or implicitly required by policies adopted over the last couple of years. In November 2022, California adopted the Advanced Clean Cars II (ACC II) program, which will require EVs to account for 35% of new passenger car, truck, and sport-utility vehicle sales starting with model year 2026, ramping up to 100% by model year 2035. A number of other states have adopted all or part of California's vehicle regulations under Section 177 of the Clean Air Act, and as a result ACC II is expected to apply to approximately one-third of U.S. light-duty vehicle (LDV) sales starting in 2027.

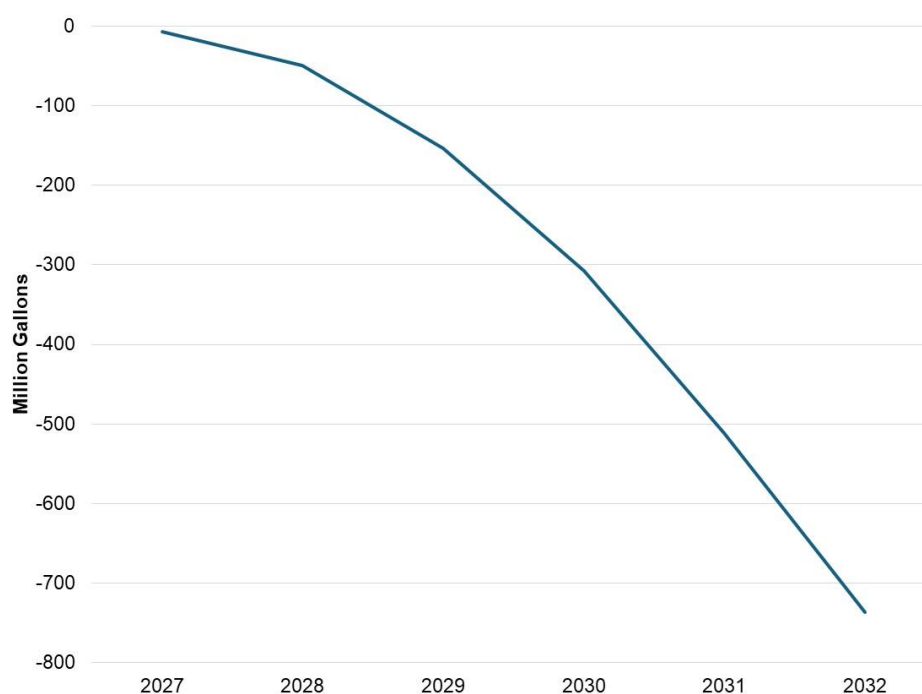
Moreover, in March 2024, EPA released its final Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles, more commonly referred to as the "tailpipe emissions standards." In conjunction with the release, the Agency stated, "EPA projects that from MYs 2030-2032 manufacturers may choose to produce battery electric vehicles (BEVs) for about 30 percent to 56 percent of new light-duty vehicle sales."² Plug-in hybrid electric vehicles (PHEVs) would account for part of

² <https://www.epa.gov/system/files/documents/2024-03/420f24016.pdf>

the remaining sales. Under EPA’s “central case” technology pathway, the share of U.S. LDV sales represented by plug-in EVs would exceed the share that would result only from adoption of ACC II by California and Section 177 states.

In a Regulatory Impact Analysis, EPA estimated the impact that the standards would have on liquid-fuel consumption. Based largely on that analysis, RFA estimates that if the average ethanol content of finished gasoline were to remain at the 2023 level of 10.39%, the annual impact on U.S. ethanol consumption would be 300 million gallons (mg) in 2030 and more than 700 mg in 2032 (Figure 3). Given that adoption of E15 is expected to continue expanding in the interim, the impact is likely to be even greater. If all finished gasoline sold in the U.S. were E15 in 2032, 1 billion fewer gallons of ethanol will be consumed than would be the case without the rule.

Figure 3: Annual Reduction in Ethanol Consumption Under EPA 2027-2032 Tailpipe Standards



Source: RFA analysis of EPA Final Regulatory Impact Analysis (Table 4-13)

Note: Assumes 98% of liquid fuel for light- and medium-duty vehicles is gasoline, based on Department of Transportation data

For land use change to actually occur, production of a certain biofuel, and the associated consumption of feedstock, must increase more rapidly than gains in feedstock production efficiency (i.e., crop yield). Models used to estimate emissions resulting from land use change typically assume that demand for a particular biofuel outpaces the agriculture sector’s capacity to provide the requisite feedstock on existing cropland. This has not occurred in the real world, and projections looking forward show this will not occur in the future.

121.3
cont.

As noted in a recent paper written by leading researchers involved in the lifecycle analysis of biofuels, “Unfortunately, land-use changes are not directly observable or measurable. Economic models have been used to estimate land-use changes.”³

Models are typically run separately for a certain biofuel volume trajectory and for a counterfactual scenario (e.g., without a policy change), and then the results are compared. Alternatively, models can be run to show the impact of a biofuel volume “shock” of a specific size. For example, in the Model Comparison Exercise that EPA conducted in conjunction with issuing the 2023-2025 volume obligations under the Renewable Fuel Standard (RFS), it introduced a corn ethanol shock and a soybean oil biodiesel shock, each of which involved an additional billion gallons of domestic consumption per year.⁴ However, as discussed above, U.S. ethanol volumes are not expected to grow materially in the near term, and usage as a road transportation fuel is expected to decrease in the medium term. That is, there is no upward “shock” to be modeled to estimate expected land use change.

In introducing its proposed sustainability requirements, CARB stated, “Crop-based and forestry-based feedstocks must not be sourced on land that was forested after January 1, 2008.”⁵

121.3
cont.

Importantly, the entire increase in U.S. corn production since 2007 has come as a result of rising yields (and switching with other crops), not expanding acreage. The U.S. harvested a record corn crop in 2023; however, if yields had stayed the same as in 2007, corn production would not have increased at all (Figure 4).

U.S. corn yields have exhibited a strong upward trend during recent decades. Yields have increased by nearly 1.9 bushels per acre annually since the mid-1990s (Figure 5). This has been the result of substantial investments in seed technology, combined with the adoption of improved agronomic practices.

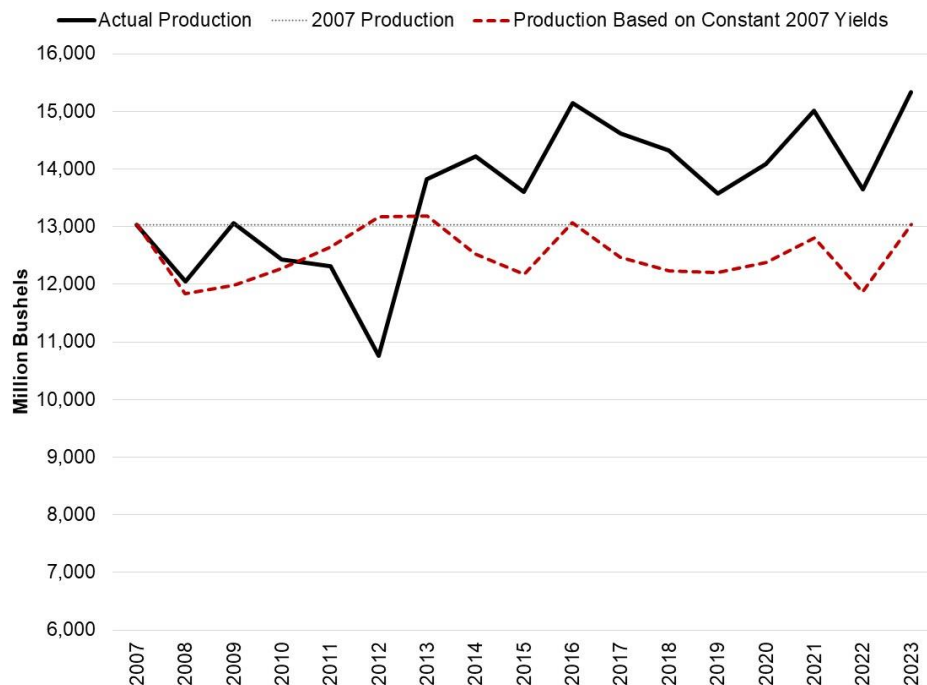
In the future, if ethanol production is steady or declines, fewer acres will be needed to grow corn to be used as feedstock for ethanol because more corn is being produced per acre. Additionally, approximately 15 pounds of distillers dried grains, a high-quality animal feed ingredient, is produced from each bushel processed for ethanol, along with nearly one pound of distillers corn oil, which is used as a low-carbon-intensity feedstock for biomass-based diesel or as a feed ingredient. Together, nearly one-third of the corn that is used by ethanol biorefineries is returned to the market in the form of coproducts.

³ <https://doi.org/10.3390/su16072729>

⁴ <https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockkey=P1017P9B.pdf>

⁵ https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/lcfs_appa1.pdf

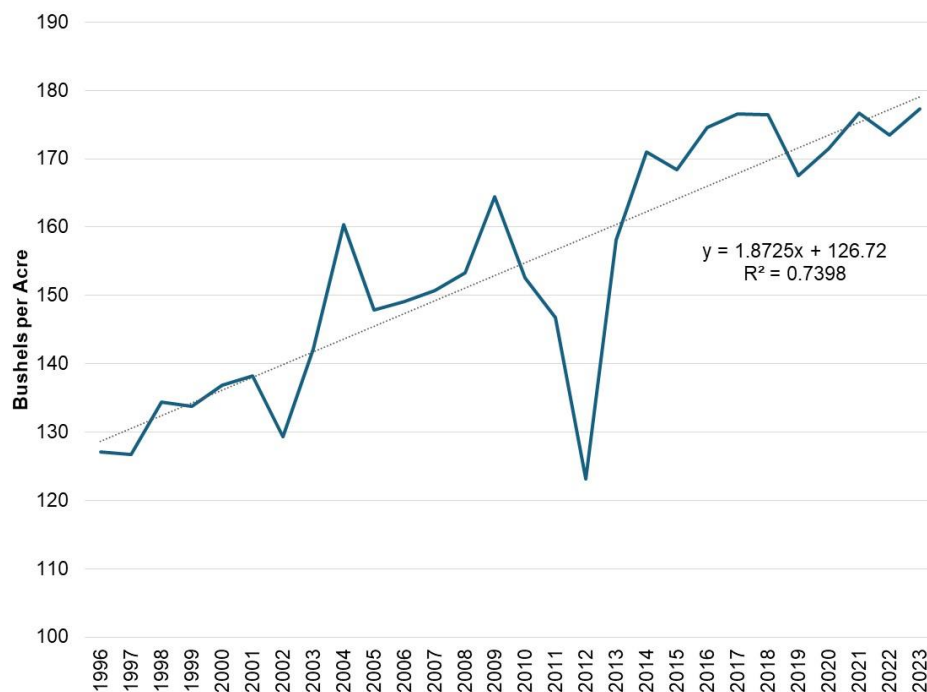
Figure 4: Actual U.S. Corn Production vs. Level if Yields Had Not Changed Since 2007



Source: USDA-NASS (historical production), RFA (analysis)

Note: Dashed line represents actual harvested acreage multiplied by 2007 yield

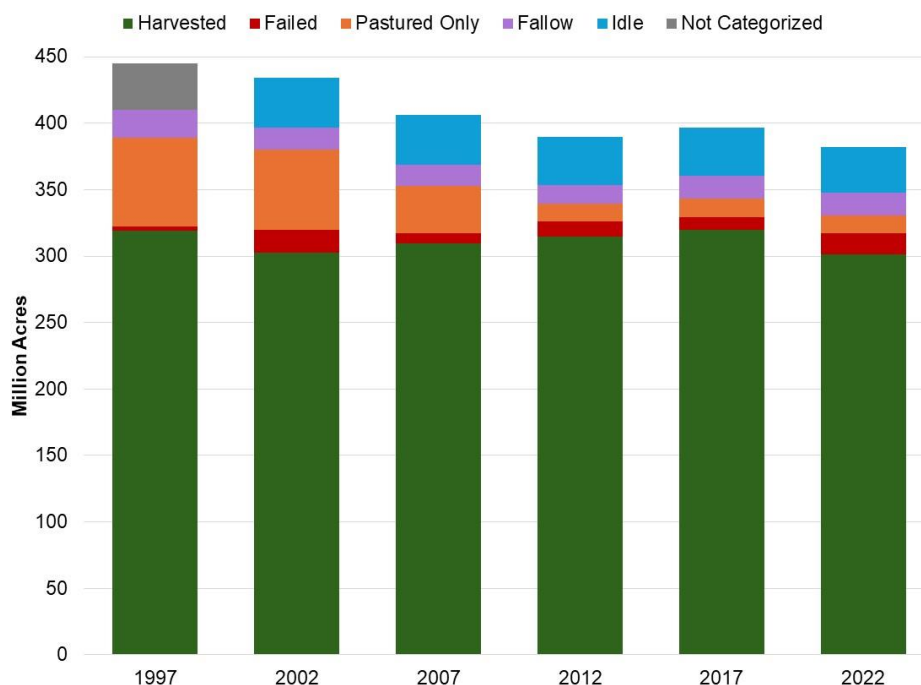
Figure 5: U.S. Average Corn Yield



Source: USDA-NASS (historical production), RFA (analysis)

Putting corn acreage dynamics into a broader context, total U.S. cropland has fallen steadily for decades, as has been documented in previous RFA comments.⁶ More specifically, cropland has declined since the beginning of 2008, the date after which CARB’s proposed sustainability criteria are intended to ensure that previously forested land is not used to grow feedstocks for the LCFS program. This decline in cropland was confirmed by the 2022 Census of Agriculture released in February, which showed that the amount of cropland in the U.S. fell by an additional 14 million acres, or 4%, since the prior Census in 2017 (Figure 6).

Figure 6: Composition of U.S. Cropland



Source: USDA Census of Agriculture

The Energy Independence and Security Act of 2007 (EISA), in which the RFS was expanded and allocated among several categories of biofuels, specified that the “renewable biomass” used to produce those biofuels must be “harvested from agricultural land cleared or cultivated at any time prior to the [December 19, 2007] enactment of this sentence that is either actively managed or fallow, and nonforested.”⁷ Thus, the RFS already accomplishes at a national level the objective that CARB has elaborated for its proposed sustainability criteria.

To implement this provision of EISA, EPA adopted an aggregate compliance approach. In its final rule for the revised RFS, EPA stated:

⁶ See particularly RFA comments dated August 8, 2022 and February 20, 2024

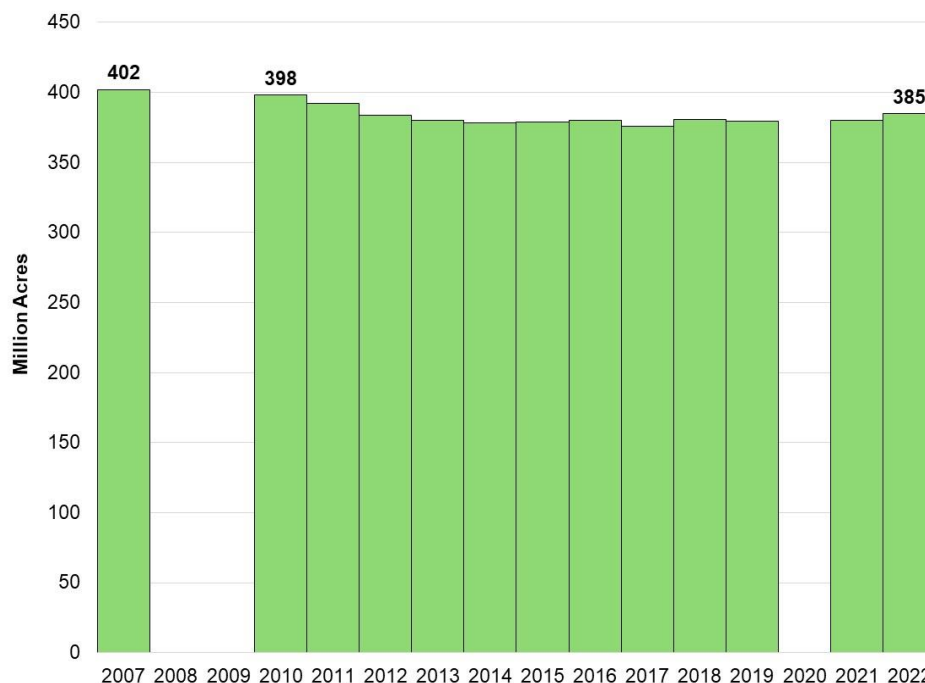
⁷ <https://www.congress.gov/110/plaws/publ140/PLAW-110publ140.pdf>

EPA has determined that an aggregate compliance approach is appropriate for certain types of renewable biomass, namely planted crops and crop residue from the United States.

Under the aggregate compliance approach, EPA is determining for this rule the total amount of “existing agricultural land” in the U.S. ... at the enactment date of EISA, which is 402 million acres. EPA will monitor total agricultural land annually to determine if national agricultural land acreage increases above this 2007 national aggregate baseline. Feedstocks derived from planted crops and crop residues will be considered to be consistent with the definition of renewable biomass and renewable fuel producers using these feedstocks will not be required to maintain specific renewable biomass records ... unless and until EPA determines that the 2007 national aggregate baseline is exceeded.⁸

To ensure compliance, EPA tracks U.S. agricultural land area annually using USDA data.⁹ Its estimate of the number of acres of agricultural land is consistent with the Census of Agriculture’s estimate of total cropland, and the two series have exhibited similar downward trends since 2007. EPA estimates that there has been a 17-million-acre reduction in U.S. agricultural land area between 2007 and 2022 (Figure 7).

Figure 7: EPA Assessment of U.S. Agricultural Land Area



Source: EPA

Note: No estimates were issued for 2008, 2009, or 2020

⁸ <https://www.govinfo.gov/content/pkg/FR-2010-03-26/pdf/2010-3851.pdf>

⁹ Note that EPA’s definition of agricultural land includes Conservation Reserve Program acreage

121.4
cont.

A similar compliance approach was recently adopted by Environment and Climate Change Canada (ECCC) for ethanol produced from U.S.-grown feedstock. As noted by USDA, “On November 9, 2023, ECCC publicly announced that it approved the U.S. application for legislative recognition which demonstrates that U.S. feedstock is in compliance with the land use and biodiversity (LUB) criteria under the Clean Fuel Regulation (CFR). ... Without legislative recognition, individual farmers or states would have had to prove their own compliance, as of January 1, 2024.”¹⁰

121.5

If California moves ahead with any feedstock certification program, there should be a provision comparable to those in the RFS and CFR to designate all U.S.-produced ethanol as in compliance with the program, so long as aggregate cropland acreage does not expand beyond a 2007 baseline.¹¹ This is justified by both the steady decline in U.S. cropland and the lack of growth reflected in federal government forecasts/analyses of future ethanol volumes, as detailed above.

It is recognized that two developments have the potential to result in growth in domestic ethanol consumption beyond these levels: the adoption of E15 and the emergence of sustainable aviation fuels (SAF). However, E15 currently accounts for a small share of U.S. finished gasoline consumption, and growth will take time, although a combination of compelling economics (including the value of LCFS credits) and compatible infrastructure would be expected to result in somewhat more rapid adoption in California if the fuel blend is approved for sale there.¹² Still, the adoption of E15 in the U.S. and specifically in California is not expected to result in significant growth in overall ethanol consumption and is more likely to result in keeping long-term ethanol consumption at or near current levels.

Regarding SAF, current production of alcohol-to-jet fuel is very small, and it will take years and large capital expenditures for the industry to be built out.¹³ Additionally, tax credits available for SAF under the Inflation Reduction Act of 2022 are scheduled to expire at end of 2027. As a result, forecasts of future SAF volumes are highly speculative.

In summary, the proposed LCFS sustainability criteria are not currently justified for ethanol. If future growth of the industry is stronger than reflected in current federal government forecasts, CARB would have sufficient time to revisit the potential introduction of requirements designed to achieve the purpose of the criteria.

¹⁰

https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=Canada%20acknowledges%20that%20US%20feedstocks%20are%20in%20compliance%20with%20Land%20Use%20and%20Biodiversity%20Criteria%20under%20the%20Clean%20Fuel%20Regulation_Ottawa_Canada_CA_2023-0053.pdf

¹¹ AB32 was enacted in late 2006, and the Low Carbon Fuel Standard was identified as a “discrete early action” for greenhouse gas emissions reduction in 2007.

¹² <https://ethanolrfa.org/media-and-news/category/blog/article/2024/04/e15-sales-set-another-record-in-2023-but-are-at-risk-again-this-summer>

¹³ <https://www.energy.gov/eere/bioenergy/articles/first-ethanol-alcohol-jet-sustainable-aviation-fuel-production-facility>

Thank you again for the opportunity to submit these comments. RFA looks forward to working with CARB staff and other stakeholders to strengthen and extend the successful LCFS program.

Sincerely,

A handwritten signature in blue ink, reading "Scott Richman". The signature is fluid and cursive, with a long horizontal stroke at the end.

Scott Richman

Chief Economist

Liane M. Randolph
Chair – Low Carbon Fuel Standard
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Proposed Amendments to the Low Carbon Fuel Standard

Dear Chair Randolph,

We appreciate the opportunity to provide feedback on the April 10, 2024 California Low Carbon Fuel Standard (“LCFS”) Workshop and provide continued comments on the proposed amendments contained in the “45-day Rulemaking Package”.

Fidelis New Energy, LLC (“Fidelis”) is an energy transition company driving decarbonization through investments in renewable fuels, low-carbon intensity products, and carbon capture and storage. Using proprietary technology and processes, Fidelis aims to develop, invest, and deliver climate positive and carbon negative infrastructure to reach carbon reduction and climate positive targets. Fidelis develops carbon negative sustainable aviation fuel, renewable diesel, renewable naphtha, clean hydrogen, and clean fuel infrastructure, in addition to developing and operating CO₂ capture units, pipelines, sequestration wells, and related transportation and sequestration infrastructure.

We applaud the California Air Resources Board’s efforts to pursue means of ensuring the continued success of the LCFS. As covered in the April workshop, the California LCFS program has been a monumental success displacing over 25 billion gallons of petroleum fuels, delivering cleaner air through PM and NO_x reductions, and driving billions in low-carbon investment.¹

Our general comments on proposed changes to the April 10th Workshop and Rulemaking Package are as follows:

- 122.1
 - **Fidelis supports a stringent initial stepdown in 2025 of 9% in the compliance benchmark CI and the implementation of the Automatic Acceleration Mechanism (“AAM”).**
 - Both the initial stepdown in 2025 and AAM are critical to address the current overperformance of the program and support the necessary investments to meet the long-term compliance targets and state goals.
- 122.2
 - **Fidelis Supports Adopting Intrastate Jet Fuel as Deficit Generator**

¹ California Air Resources Board. “California Low Carbon Fuels Standard April Workshop Slides”, April 10, 2024. ww2.arb.ca.gov/sites/default/files/2024-04/LCFS%20April%20Workshop%20Slides.pdf

In addition to the general comments above, Fidelis has specific comments regarding the sustainability requirements for crop-based and forestry-based feedstocks as well as the definition of biomass waste.

122.3

Fidelis recommends that CARB clarify the language under §95488.9.g.1.A to align with the intent of establishing a transition timeline to the implementation of sustainability requirements.

With regards to the sustainability requirements under §95488.9.g Sustainability Requirements for Crop-Based and Forestry-Based Feedstocks, the current language is ambiguous with respect to the January 1, 2028 transition date:

All crop-based and forestry-based feedstocks used for LCFS fuel pathways must meet the following sustainability requirement:

(1) Maintain continuous third-party sustainability certification under an Executive Officer approved certification system.

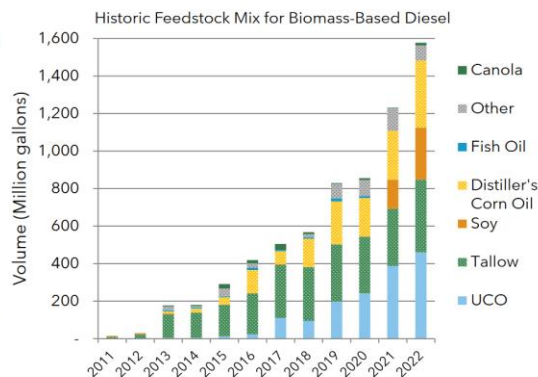
(A) All feedstocks at the point-of-origin must be certified by January 1, 2028. Fuel quantities reported under fuel pathways utilizing feedstocks not certified by January 1, 2028 must be assigned the ULSD carbon intensity found in Table 7-1 of the LCFS regulation.

The LCFS April Workshop makes it clear that the January 1, 2028, date is intended to enable a transition period for the implementation of sustainability certifications in existing fuel pathways as shown below.²

Figure 1. LCFS April Workshop Clarifies the Purpose of January 1, 2028, Date

Crop Sustainability

- Biofuel production must not come at the expense of deforestation or food production.
- CARB staff solicited feedback on crop-based biofuels sustainability concerns during past workshops
- Staff directed to investigate guardrails at the Sept 28, 2023 informational board hearing
- Staff 45-Day Proposal:
 - Require independent feedstock certification by a certification body approved by the Executive Officer
 - Built in timeline to develop those standards and approval processes by third party certifiers**
 - Remove palm-derived fuels from eligibility for credit generation
- Also considering other changes



² California Air Resources Board. (April 10, 2024) "California Low Carbon Fuels Standard April Workshop Slides" ww2.arb.ca.gov/sites/default/files/2024-04/LCFS%20April%20Workshop%20Slides.pdf

The language proposed regulations should be updated to reflect that the intent of the January 1, 2028, date is the date by which the fuel quantities reported under fuel pathways must use feedstocks with a recognized sustainable certification. This will clarify that after 2028 additional feedstocks can undergo a recognized sustainability certification and would be eligible under the LCFS once certification is complete. Without this clarification to the regulatory text, it is feasible that this date may be inappropriately interpreted in the future.

In addition to the clarification of the crop-based and forestry-based feedstocks, Fidelis recommends that the definition of eligible forestry residues under the proposed regulation is broadened. Our prior comments on this are reproduced below:

122.4 **Fidelis Supports Expanding Definitions for Acceptable Biomass Waste Feedstocks**

It is critical for CARB to adopt a broader biomass definition in not only the most recent LCFS legislative proposal, but all future policy rulings by the Agency. The proposed utilization of arbitrary terms such as “unmerchantable” and certain “diameter sizes” for secondary material unnecessarily limits the potential feedstock pool, in potentially counterfactual ways, ultimately limiting the adoption of carbon neutral and negative technologies.

Furthermore, it is unreasonable to qualify material based upon diameter. This is out of alignment with existing federal programs and would be a departure from industry norms. Tracking and classifying material eligibility based on material diameter is not practical for companies to pursue from an effort, in-field feasibility, and cost perspective. Anything that is deemed as incidental material should be permissible as biomass feedstock, regardless of size. This would be inclusive of larger diameter residues, sawmill residues, and other to-be-defined materials.

One telling example would be the application of woody biomass generated as debris resulting from a natural disaster, such as a hurricane. In Louisiana, roughly 2 million tons of debris are generated per parish due to hurricane damage. Material generated in this quantity, and this quality, are generally destined to be landfilled as a means of disposal/use. From this perspective, the material is truly “unmerchantable”. However, this hurricane debris - largely felled trees, large limbs and branches, fibrous industrial debris such as wooden planks and sidings from buildings, etc.- would then fall outside the identified diameter limitations currently proposed, limiting a positive utilization option and further impairing the local environment. Based on the current proposed biomass limitations, this hurricane debris would not be viewed as a usable feedstock, despite its utilization in fuel/power production being a greener alternative than the material going to landfill to decompose.

In Fidelis’ experience, a common point of concern amongst stakeholders is the availability and longevity of biomass supply. Focusing narrowly on specific forestry residuals, such as fire mitigation clearings, will restrict the longevity and sustainability of biomass management industries, and pits various regions of the US against one another, rather than focusing on the scientific benefits of biomass management in general. For the bioeconomy to flourish, all available biomass opportunities must be accessible to producers for credit generation including management actions necessary to maintain a healthy ecosystem, such as thinning. It is vital that the legislation

considers the economic and environmental benefits of utilizing biomass uniquely to all regions and not through a narrow consideration of biomass impacts specific to certain regions, such as fire management areas. This is important because fire management and mitigation only applies as a main driver for biomass in a few western states while it is not directly applicable for most of the available biomass in the United States.

Louisiana is one of the most prolific managed forestry regions in the world, with roughly 290 million tons per year of pulpwood and forest residuals harvested every year across the entire region. Pulpwood, sometimes referred to as “pre-commercial thinnings” or “secondary residuals”, is a byproduct of prudent forestry management generated in to ensure healthy forest stands and state, local, and private habitat management.

Though there are some market outlets for this material today, the utilization of forestry management byproducts would not result in market distortion for these products. In fact, a market for this material is necessary to continue supporting proper timberland forestry management whereby the historical offtake demand for this material at pulp and papermills is significantly receding. With the closure of the papermills, there currently exists few viable markets for low-grade or waste timber in the Southeast, resulting in an increase of forest biomass thinnings left to decay on the forest floor where it is converted into CO₂ that is released into the atmosphere. Without a healthy market for pulpwood and low-grade fiber in the area, forestry management on hardwood stands would no longer be economically feasible, reducing the ability to properly manage forests. This would result in unhealthy and low-quality timber stands that would take decades to recover, in addition to unmanaged ecosystems that will impair local wildlife. Projects participating in the LCFS program would provide a viable and sustainable market for low-grade hardwood and softwood fiber. This in turn would allow foresters to effectively manage the region’s forest resources. Effective forestry management practice results in positive environmental impacts such as: increased carbon stocks stored in living large older trees and improved habitats for endangered species.

Forestry suppliers would comply with operational integrity requirements, as many of these documentation and planning practices are industry standard today. For example, in Louisiana, a forestry management plan precedes harvests with the express purpose of supporting suspected and known endangered species on the sites. In forestry managed areas, plans are reviewed by biologists, academics, agency staff, and the public (in the case of state-owned land). All forestry management operations are currently documented. This documentation covers all harvest and thinning operations and includes property descriptions, dates of treatment(s), employed contractors, current stand conditions, volumes, and future planned activities. Supporting the low-grade wood market in the region allows forest managers to appropriately maintain forest stand health as well as habitats of endangered species found on the managed properties.

Guided by a life-cycle emissions analysis approach, Fidelis recognizes the climate-positive opportunity to utilize a wide variety of potential biomass sources, including pulpwood, as a renewable fuel feedstock, providing an alternative use for byproduct materials.

122.5 **Fidelis Supports Scoping Feasible Traceability and Certifiability Procedures**

Letters of attestation are an appropriate means of providing feedstock certification that aligns with the 7 priorities identified by CARB in its recent LCFS proposal, as well as appropriately fitting the maturity of the upstream biomass industry.

In terms of establishing a chain of custody for traceability purposes, bills of lading (“BOLs”) are a tool used by multiple sectors today to trace material movements along their supply chains. Whether it be forestry management materials, landfill diversion, ag residues, or other material groups, BOLs provide a means of tracing the supply chain of custody for biomass to be used by BECCS facilities from the point of origin to final user. As a legally binding document, BOLs provide a complete description of shipments and parties involved, including:

- The quantity, value, and weight of the cargo.
- A complete description of items within the cargo, and its freight classification.
- The shipping and receiving parties as well as their signatures and the shipping date.
- Location of origin and destination

By tracking and documenting these components, BOL’s ensure that there is oversight from point of origin to transport vehicle, to staging destination (if applicable) to end-user. In doing so, this document creates a receipt for the products, and generates a traceable supply chain for BECCS facilities.

Depending on the type of biomass material being utilized and the scale of the BECCS facility, the length and structure of the supply chain will vary. BOL’s will allow these variances to be captured. Two examples that help demonstrate this difference are:

- Residues sourced from a local mill and trucked to the BECCS facility.
 - In the case of mill residues and chips, the point of origin would be the mill where the materials were generated as a secondary waste in the milling process and loaded for transit. It is at this point that the residues would become a secondary product eligible as a feedstock for usage under CARB’s LCFS, as well as other programs, given they are a waste stream and were not purposefully generated as a fuel or feedstock.
 - A single BOL would be generated in this instance: at the loading of materials onto a truck at the local mill, to be delivered to the BECCS facility and signed by the receiving personnel on site with specific details around the batch (volume, product, quality, etc.).

- Because these feedstocks are a processing residue resulting from the production of primary materials such as finished lumber, furniture, pallets, barrels, etc., it is an undue burden upon the mill owner to trace residues upstream of the facility. Furthermore upstream actions were not intended for the utilization or consumption of these residual fibers. Should these fibers not be utilized, mills would landfill the product, leading to CO2 emissions in the decomposition process.
- Pulpwood, and other byproducts and residues, sourced from managed forestry stands.
 - In the case of this example, this could include but would not be limited to: wood fiber of low grade quality and various diameters, material falling within a pulp classification, limbs/tops/slash/bark, or other low-grade material that would be harvested, potentially in-woods chipped, and/or left on the forest floor.
 - In the case of forestry management material, the point of origin would be where this pulpwood and low-grade fiber would be collected, and potentially chipped, and loaded into trucks at the timber stand where the material was harvested as part of established forestry management practices and loaded for transit.

Tracking BOLs from point of origin to the end-user will enable the certifiability of the material utilized for the benefit of BECCS facilities, increasing oversight and transparency across the supply chain.

* * * *

Thank you for the opportunity to submit these comments. We welcome the opportunity to meet with the California Air Resources Board to discuss these issues in greater detail and to answer any questions that you may have.

Respectfully submitted,

Fidelis New Energy, LLC



May 10th, 2024

To the California Air Resources Board (CARB):

We write in strong support of CARB's Low Carbon Fuel Standard (LCFS) and wish to express our appreciation for the ability to participate in, and comment upon, the development of this historic program.

By way of background, Carbon Solutions Group (CSG) is a developer of EV charging infrastructure and aggregator of environmental attributes. In California, we have developed ~230 DCFC and L2 charging ports, which represent roughly 3000 kW. We are developing another ~220 charging ports over the next two years in California, which will, in total, represent 10,000 kW. As a REC aggregator, CSG has passed on \$160M to 30,000 consumers across the U.S. We are in the process of bringing 1,400 residential solar systems online in California this year.

Previously, we commented upon CARB's proposed LCFS amendments as part of the comment period that ended in February 2024. Today, we respectfully offer three additional comments in light of CARB's recent April 10th workshop. In summary:

- 123.1 I. We would like to respectfully reiterate the importance of allowing owners of residential EV charging infrastructure to participate in residential base credits. This is a crucial issue when it comes to addressing the equity gap in California, incentivizing electrification, and awarding the best available utilization data.
- 123.2 II. We previously supported an increased CI step down for 2025. At minimum, we would strongly encourage a 7% step-down. However, we now believe a 9% step-down would be even more effective.
- 123.3 III. As per the amendment of Subsection 95486.2(b)(4)(H): We respectfully appeal for qualification of this capex multiple to occur upon passage of the amended regulations (ca. 2024), as opposed to its presently stated 2026 start date. Should the 2026 date remain intact, we request further clarification as to whether that date indicates timing for project registration or whether it means the capex multiple applies only to projects that come online after that 2026 date.

These points are examined in greater detail as follows.

I. Residential: Base Credit Qualification

123.4

As presently dictated, residential base credits for EV charging—which make up the majority of residential credit value—default to utilities. We believe this procedure inadvertently undermines the state’s transportation electrification goals. This inefficiency manifests across two main categories: i) failure to properly incentivize LDV electrification across all income levels in an equitable fashion; and ii) failure to award the best available utilization data.

In light of the April 10th workshop, we again strongly appeal to CARB to consider awarding base + incremental residential credits to the owners and operators of residential EV charging infrastructure.

Credits Should Incentivize the Primary Risk Takers

For California to reach a majority ZEV transportation pool, it will need to incentivize low- and moderate-income households to convert to LD EVs from gasoline-fueled cars. Many of these households rent within multi-unit developments and struggle paycheck-to-paycheck. For these individuals, cash-on-hand is a top priority. Unless a policy-based program incentivizes an economically vulnerable citizen to take the financial risk to make a fuel switch, that citizen has little reason to adopt a new type of vehicle.

For individual drivers, incentives need to address both the EV purchase as well as readily available charging infrastructure—without the latter, the former becomes an impractical purchase. According to multiple studies, EV drivers prefer to charge their vehicles at home. Therefore, the need for economic incentives is particularly pressing for residential charging infrastructure, which can cost a Californian between \$1,000 and \$4,000 to operationalize in a new, single-family home—on top of the vehicle purchase. For retrofits, such as those in multi-unit developments, the financial outlay is much more burdensome, with costs ranging from \$3,000 to \$15,000 *per charger*. Unlike EVs themselves, which represent a depreciating but re-sellable asset class, there is no viable secondary market for EV charging infrastructure. Thus, residential charging infrastructure, once installed, is a sunk cost.

In spirit, California’s LCFS is exactly the type of policy-based incentives program that can award property owners who take on the risk to adopt residential EV charging infrastructure. However, in practice, the program does not sufficiently award the primary financial risk taker in this process but instead awards the state’s utilities. California’s utilities no doubt contribute in an outsized way to the state’s total energy ecosystem, but these entities bear little-to-no financial risk when a property owner or EVSP owner/operator decides to put up the capital to install residential EV charging infrastructure.

Rather, amending CARB’s current regulations to award base credits + incremental credits to residential property owners that install EV charging infrastructure would represent a more equitable program and likely lead to much greater gains in overall EV adoption in California.

Rebate Programs Are Not Enough to Move the Needle

123.5

As it stands, utilities are supposed to funnel base credit profits into rebate programs, which ostensibly support electrification and offer EV incentives for low-income communities. In this way, it can be argued that rebates are an incentive for the property owner. While this structure is well-intentioned, any diluted incentive, such as an indirect rebate still requires the buyer to put up a significant amount of capital before achieving any sort of payback—which, in a rebate scenario, could be an incomplete payback over a long period of time. For low-income and moderate-income Californians, this indirect rebate structure will likely result in many homeowners opting to save their cash or pay down existing debt, rather than take on greater financial risk by investing in EV charging infrastructure.

The California Energy Commission reported that, as of the end of last year, only 3.8% of light duty vehicles on the road were battery-electric powered—versus 87.5% of vehicles being gasoline fueled. For context, Tesla Model Ys and Model 3s far and away comprised the majority of that battery-electric powered 3.8%. These statistics offer further proof that the current rebate structure may not be sufficient on its own.

Administrative Overburdening Can Be Avoided

123.6

The main rationale for awarding base credits to utilities appears to be premised upon a well-justified fear of administrative overburdening. That is, if every single homeowner in California became a LCFS account holder, administrative capacity would likely be overwhelmed in short order. However, we believe that creating credit volume floors and an “approved vendor” process can incentivize aggregation and limit the potential for any account creation overload that might overwhelm a regulatory agency.

Such an approach would be similar to many Renewable Portfolio Standard (RPS) programs, which delegate account creation to approved installers/aggregators that bundle home system-generated credits, while still passing on the actual credit earnings to homeowners. Aggregators can also help reduce the overall upfront cost to the homeowner by way of upfront payments and reduced installation costs.

Charge Point Owners Maintain the Best Available Utilization Data

123.7

Utility-generated base credits do not rely on the best available data. Unless a utility operates a residential charge point, or the homeowner has charging infrastructure sub-metered, utility-derived utilization data is based on averaging and does not reflect real, specific utilization. Therefore, as financial instruments, utility generated base credits are not representing actual kW/CO₂e value per charger but rather represent a best guess of kW/CO₂e value per charger. From a market perspective, this lack of stringency in base credit generation is unlikely to help mitigate depressed credit prices.

On the other hand, as noted in our previous letter, residential property owners with on-site EV charging infrastructure—as well as EVSE developers, network operators, and some OEMs—have access to real utilization data specific to each charge point/vehicle. This data is exact and not based on averages. Therefore, the instrumentalizing of kW/CO₂e value in credits generated by residential

property owners or network operators leads to exact metrics and, thus, more stringent crediting volumes.

Prioritize Multi-Unit Dwellings If Need Be

123.8 In short, we believe that California’s LCFS will be most effective if it rewards the primary financial risk taker in EV charging infrastructure installation—that is, the property owner paying for the installation. This risk taker also has the added value of providing access to the best available data. However, should CARB decline to address this equity gap in the near term. We respectfully request that CARB, at minimum, award base + incremental credits to owners of EV charging infrastructure in residential multi-unit dwellings. Considering single-family homeownership has become cost-prohibitive for many Californians, multi-unit dwellings and rentals are the single most important property type to incentivize, as a communal charging option in multi-unit/rental residences can open up the opportunity for low-to-middle income drivers to adopt EVs with greater ease.

II. Carbon Intensity Step-Down

123.9 We were encouraged to hear that CARB is considering more stringent CI step-down benchmarks during the April 10th workshop. As noted in our previous letter, we support *at least* a 7% step-down in 2025. However, we would commend and welcome an even more stringent 2025 step-down of 9%.

III. Public: FCI Timing for LDV

123.10 As noted previously, regarding the proposed LD-FCI 1.5 capex multiple noted in Subsection 95486.2(b)(4)(H), we respectfully appeal for this multiple to qualify for immediate application upon passage of the regulation (ca. 2024), as opposed to its stated January 1st, 2026 start date.

However, should the 2026 start date remain, we would ask for, at minimum, further clarification as to its applicability. Namely, it remains unclear as to whether the proposed language would apply to projects that *certify* on or after January 1st, 2026 or whether the amendment concerns those projects which *come online* after January 1st, 2026. In either case, we respectfully reiterate that immediate applicability of this multiple, upon passage of the regulations, will best serve electrification of California’s transportation pool.

The above comments are offered in light of CARB’s ongoing expertise, diligence, and efforts to optimize California’s LCFS. We thank you for your vision and ethic, and remain, as ever, proud participants of this world-leading program.

Michael Daley
Director of Policy & Government Affairs
Carbon Solutions Group
mdaley@carbonsolutionsgroup.com



May 10, 2024

Re: Comments on the April 10th Workshop

Submitted electronically: <https://ww2.arb.ca.gov/public-comments/low-carbon-fuel-standard-workshop-april-10-2024>

California Air Resources Board,

The Clean Fuels Alliance America (Clean Fuels)¹ and California Advanced Biofuels Alliance (CABA)² appreciate the opportunity to provide comments on the April 10th workshop. Clean Fuels and CABA have been longtime supporters of the state's overall climate and air quality improvement goals and have collaborated frequently with CARB staff toward achieving those goals. As noted in staff's presentation, in 2023, over 60% of fossil diesel has been displaced by biomass-based diesel provided by our members. We continue to be strong supporters of California's efforts to decarbonize its economy, especially the transportation sector, with a comprehensive all-of-the-above suite of measures.

Clean Fuels and CABA appreciate the enormity of staff's efforts throughout this rulemaking process to amend the Low Carbon Fuel Standards (LCFS) – from holding workshops and making themselves available for meetings, and updating the technical analysis based on our feedback – and find the right combination of feasibility, flexibility and certainty needed for the LCFS to continue its success. Along those same lines, Clean Fuels and CABA and its members have also spent countless hours educating staff on the intricacies of our industry by providing information and real-life perspective on how staff's proposals may impact our industry.

With respect to the materials and concepts presented in the April 10th workshop, Clean Fuels and CABA have the following comments:

124.1

- We strongly encourage CARB to implement an immediate **9% step-down** (rather than the 5% proposed in the Initial Statement of Reason). The 9%step-down scenario provides the most certainty to rebalance the LCFS credit bank in the short-term, as intended within this

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124.1
cont.

rulemaking. The 5% and 7% step-down scenarios are insufficient to balance the market and would require the Automatic Acceleration Mechanism (AAM) to trigger in order to draw down the credit bank. This would result in an unnecessary delay in correcting the market at a time when credit prices are at an all-time low. We believe that the 9% step-down should be sufficient to rebalance the market and return credit prices to robust levels; but if it doesn't, then coupling it with an AAM would provide an important insurance mechanism to do so.

124.2

- We strongly encourage CARB to develop an AAM that starts in 2026 (rather than 2027 as proposed in the ISOR). If the market continues to overperform and the credit bank continues to swell, then the delay of an additional year to act will further harm the industry. Quicker action is needed to avoid this negative outcome.

124.3

- We encourage CARB to fix an error in the proposed CA-GREET 4.0 to the tailpipe emission factors for NO_x and CH₄ for biodiesel and renewable diesel. This error is a result of increasing emissions from fossil diesel and should carry over to BMBD as well. At the April 10th workshop, staff acknowledged the mistake and said that the error had been corrected but the correction is also inaccurate; instead of adjusting emissions by 2.74 gCO₂e/MJ, they adjusted it by 4.78 gCO₂e/MJ. This overcorrection results in fewer GHG reductions occurring from the use of biodiesel and renewable diesel.

124.4

- We support the tracing requirements for specified source feedstocks that are included in the proposed regulation. Full chain-of-custody documentation throughout the entire supply chain will demonstrate that waste feedstocks meet the goals of the program and help facilitate continued broad support for these important low carbon products. We support CARB staff engaging in rigorous oversight over all pathways – whether virgin or waste – to ensure accuracy and legitimacy of the respective low carbon fuels.

124.5

- We appreciate CARB's efforts to update its assumptions about the recent trends in biomass-based diesel feedstock trends, crop-based oil prices, and soy production and consumption³. We agree with staff's analysis that increasing investments in production and crushing infrastructure will increase the domestic virgin oil supply and that it is uncertain whether a substantial increase demand will occur in California over the long-term.⁴ To that point, we remain concerned regarding the continuing call for guardrails to reduce the risk of potential impacts from an unsubstantiated demand increase.

124.6

- We respectfully request that the GTAP model be updated to use the most recent data available (2022) given that the land use change values were last updated in 2015; indeed, the current GTAP modeling that the LCFS relies on uses outdated datasets, some of which are now nearly two decades old. Failure to update the GTAP model is particularly puzzling

³ Staff presentation, Slides 53–56.

⁴ Staff presentation, Slide 57.

124.6
cont.

in light of the rulemaking's proposed updates to every other model the LCFS relies on and staff's latest proposal to allow for the use of empirical data to inform a fuel and feedstock combination that is not currently covered by a Table 6 value, a concept that we support. Updating the Table 6 values would bring consistency across the data sets used to determine the carbon intensity of fuels throughout the program. Updating GTAP for US-based soy is particularly important with respect to the above-mentioned forecast about the growth in domestic soy oil production and its value in the California market.

Further, the failure to update GTAP might suggest that CARB is confident that GTAP adequately addresses sustainability concerns in the geographic areas that are listed in Table 6, which means those areas should automatically exempt from any additional sustainability requirements.

124.7

- While there is significant urgency in updating the items above, there is no parallel urgency to adopt additional sustainability guardrails. As stated above, with the growth in the domestic supply of feedstocks and existence of similar sustainability programs, CARB has not proven that additional sustainability certifications are necessary at this time. We strongly recommend that CARB convene a working group that includes agricultural feedstock providers, feedstock processors, and biofuels producers to help flesh out workable sustainability guardrail provisions that CARB can complete by the second quarter of 2025. This gives time for the working group to meet and develop reasonable solutions while allowing CARB to continue to focus on implementation of the rest of the LCFS update by the end of 2024. Our members are eager to work with CARB staff to work through the many details involved in this topic.

124.8

Providing additional process to develop such an important element of the program would be in line with past CARB practices. To illustrate, the current rulemaking introduced for the first time proposed sustainability provisions in late December 2023, followed by a single workshop in April 2024 where those provisions were a relatively minor part of the discussion agenda; by contrast, CARB previously engaged in a near-2 year public process focused solely on an attempt to develop sustainability criteria for the LCFS in the early 2010s, pursuant to Board Resolution 09-31⁵.

In order to expedite the discussions of the working group, we encourage CARB to consider comments submitted by two of our partners, the National Oilseed Processors Association (NOPA) and the American Soy Association (ASA).

124.9

- NOPA offers the recommendation that a targeted risk-based approach be used to consider risk associated with deforestation and the sustainability of crop-based fuels, by separating out 1) low-risk regions and 2) imported feedstocks and high-risk regions or regions without insufficient data. Implementing a targeted risk-based approach to sustainability criteria offers several advantages. It allows CARB to prioritize resources and regulatory efforts where they are most needed, ensures that sustainability criteria are effectively applied without imposing unnecessary burdens on low-risk regions or

⁵ [CARB Board Resolution 09-31](#) at 17.

124.9
cont.

established sustainability programs, and ensures sufficient supplies of low-carbon fuels for the California market.

- ASA offers the recommendation that CARB consider existing regulatory requirements and voluntary practices to satisfy sustainability concerns, specifically the US Soy Sustainability Assurance Protocol (SSAP). The SSAP is a trusted and widely accepted tool to verify sustainable soy production in the US and can be modified to become the roadmap for the global scene as well.

Clean Fuels and CABA thank CARB staff for their continued efforts to strengthen the LCFS and provide the vision for the program to meet California's carbon neutrality goals. Thank you for your consideration of these comments. We look forward to continuing our strong collaboration with CARB and staff.

Sincerely,



Cory-Ann Wind
Director of State Regulatory Affairs
Clean Fuels Alliance America



Carlos Gutierrez
Executive Director
California Advanced Biofuels Alliance



May 10, 2024

Re: Comments on the April 10th Workshop

Submitted electronically: <https://ww2.arb.ca.gov/public-comments/low-carbon-fuel-standard-workshop-april-10-2024>

California Air Resources Board,

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- We support the tracing requirements for specified source feedstocks that are included in the proposed regulation. Full chain-of-custody documentation throughout the entire supply chain will demonstrate that waste feedstocks meet the goals of the program and help facilitate continued broad support for these important low carbon products. We support CARB staff engaging in rigorous oversight over all pathways – whether virgin or waste – to ensure accuracy and legitimacy of the respective low carbon fuels.
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Clean Fuels and CABA thank CARB staff for their continued efforts to strengthen the LCFS and provide the vision for the program to meet California's carbon neutrality goals. Thank you for your consideration of these comments. We look forward to continuing our strong collaboration with CARB and staff.

Sincerely,

A handwritten signature in black ink that reads "Cory-Ann Wind". The script is fluid and cursive.

Cory-Ann Wind
Director of State Regulatory Affairs
Clean Fuels Alliance America

A handwritten signature in blue ink that reads "Carlos Gutierrez". The script is fluid and cursive.

Carlos Gutierrez
Executive Director
California Advanced Biofuels Alliance



California Air Resources Board (CARB)
California Low Carbon Fuel Standard (LCFS) | Stakeholder Feedback

125.1

This comment is intended to recommend the use of the carbon-14 testing method to determine the share of biogenic carbon content of feedstocks, fuels and emissions under California’s Low Carbon Fuel Standard (LCFS). Biogenic content measurements following methods such as ASTM D6866 Method B currently provide critical value to prominent clean fuel standard programs including California’s LCFS.

Included here you will find:

Recommendations for California’s Low Carbon Fuel Standard	1
What is Biogenic Testing (Carbon-14)?	5
ASTM D6866 Method B - The Most Reliable Method	6
About Beta Analytic	7
ISO/IEC 17025:2017 laboratory	8
Required tracer-free facility for Carbon-14	8
References	9

Recommendations for California’s Low Carbon Fuel Standard

Our recommendation is that California’s Low Carbon Fuel Standard (LCFS) should include direct biogenic content testing requirements following the ASTM D6866 Method B standard for any fuels or feedstocks seeking recognition of renewable (biogenic) content. Routine direct biogenic testing requirements are the only reliable method of incentivizing the use of biomass derived content and guaranteeing compliance. Routine biogenic testing requirements currently play a critical role in California’s LCFS and prominent similar programs.

California’s LCFS currently requires testing following ASTM D6866 for any fuels produced from co-processing and recommends testing for fuels produced from municipal solid waste (MSW). Several of the updates being considered by the program could benefit from the introduction of similar testing requirements and offer opportunities to strengthen the existing requirements.



Require Routine Biogenic Testing for Fuels Produced from MSW

125.1
cont.

Beta's first recommendation for this update to this LCFS is to introduce routine biogenic testing requirements for fuels produced from MSW in line with the program's requirements for co-processing. Given the heterogeneous nature of MSW, it is critical that routine testing requirements be maintained to make sure the program only rewards the renewable portion of those fuels.

Implementing routine testing for these fuels would be in line with the requirements of the US Renewable Fuel Standard (RFS), Canada's Clean Fuel Regulations (CFR), Oregon's Clean Fuels Program (CFP) and other leading programs.¹ As CARB updates the program, it is important to improve this policy from a recommendation to a requirement.

Update the Certification Framework for Biogas, Biomethane & RNG

125.2

Beta also recommends that CARB introduce routine biogenic testing requirements for fuels produced from biogas, biomethane and RNG. As CARB considers the best way to move forward with biogas, biomethane and RNG in the program, we recommend reviewing the [Biogas Regulatory Reform Rule \(BRRR\)](#), which the EPA included in the RFS Set Rule, the EU's updated methodology for biogas under the Renewable Energy Directive (RED), and Canada's Clean Fuel Regulations (CFR) Quantification Method (QM) for Co-Processing.² These recent policies reflect the leading best practices for regulating this sector under clean fuel programs.

The US introduced biogenic testing requirements for fuels produced from biogas in the 2023 Set Rule update to the US Renewable Fuel Standard (RFS), in a section called the [Biogas Regulatory Reform Rule](#).³ This update requires routine biogenic testing for any biogas or RNG fuels seeking to generate RINs under the RFS. Starting on July 1st, 2024 for new facilities and January 1st, 2025 for existing facilities, fuels produced from biogas will need to submit biogenic test results of the biogas at the point of production from the digester/landfill, at the point of upgrading, and after upgrading prior to pipeline injection.

The EU introduced biogenic testing requirements for fuels produced from biogas in a June 2023 update to the EU Renewable Energy Directive (RED) titled, ["Renewable energy- method for calculating the share of renewables in the case of co-processing."](#)⁴ This update was specifically issued in response to the discovery of a major case of fraud within the RED program stemming from biodiesel submissions from China which were approved by mass balance calculations.⁵ The EU investigation into this issue is still

¹ 2010. "40 CFR Part 80 Subpart M— Renewable Fuel Standard." *National Archives Code of Federal Regulations*

2023. "Renewable energy- method for calculating the share of renewables in the case of co-processing." *European Commission*

2022. "Clean Fuel Regulations: Quantification Method for Co-Processing in Refineries." *Environment and Climate Change Canada*

² 2023. "40 CFR Parts 80 and 1090— Renewable Fuel Standard (RFS) Program: Standards for 2023–2025 and Other Changes." *EPA*

³ 2023. "40 CFR Parts 80 and 1090— Renewable Fuel Standard (RFS) Program: Standards for 2023–2025 and Other Changes." *EPA*

⁴ 2023. "Renewable energy- method for calculating the share of renewables in the case of co-processing." *European Commission*

⁵ 2023. "ISCC Press Release July 27, 2023." *International Sustainability & Carbon Certification*



ongoing, and the full extent of the damage is not yet known, but this was a significant setback for the program and quickly plummeted biodiesel prices in the EU.

The EU tied biogas, biomethane and RNG into the update in order to address these concerns for any fuels containing a mixture of biogenic and fossil content. The advantage of this framework is that the EU was able to continue to accept calculation based methodologies like mass and energy balance by requiring routine direct biogenic testing to validate the data. However, calculation based approaches are much more common for co-processing, where all inputs and outputs are concentrated in a single facility, as opposed to biomethane and RNG which are often produced, upgraded and blended at multiple facilities.

Canada's CFR introduced routine biogenic testing requirements for hydrocarbon gas fuels alongside co-processing in July 2022.⁶ The program's QM for co-processing requires routine direct testing following ASTM D6866 for, "each co-processed fuel, product and hydrocarbon co-product produced in the project," including gasses beyond biogas, biomethane and RNG, such as renewable propane. Introducing these requirements for biogas, biomethane and RNG alongside co-processing in 2022 when the RFS, RED and LCFS only required testing for co-processing has allowed the CFR to avoid many of the sustainability and verification concerns currently impacting the market for these fuels in California, the US and the EU. We recommend that CARB use this update to apply the same requirements in place for co-processing under the LCFS to biogas, biomethane and RNG.

Require Biogenic Testing as Sustainability Criteria for Waste Feedstocks

We recommend that CARB also consider the BRRR Set Rule update when updating the program's sustainability criteria for waste feedstocks. The BRRR requires testing at the point of biogas production, at the point of upgrading to a fuel and at the point of blending with any non-renewable components prior to pipeline injection.⁷ This approach provides a simple but comprehensive framework to apply for waste feedstocks. By testing the initial feedstock, the fuel at the point of upgrading and the final blended fuel, there is a clear demonstration of biogenic content from the waste feedstock to the final product. Given that these feedstocks need initial verification and that biogenic content ends up in various co-products during production, this approach provides a holistic way to incentivize only the renewable portion of fuels produced from these feedstocks.

It is critically important that this program require direct testing rather than allow calculation based approaches such as mass balance, which make claims based on material inputs in production. These calculations allow producers to assume that all of their biomass inputs end up in their facilities' outputs, despite it being well understood in the industry that the input of renewable feedstocks is not the same

⁶ 2022. "Clean Fuel Regulations: Quantification Method for Co-Processing in Refineries." *Environment and Climate Change Canada*

⁷ 2023. "40 CFR Parts 80 and 1090– Renewable Fuel Standard (RFS) Program: Standards for 2023–2025 and Other Changes." *EPA*



125.3
cont.

as the output. Renewable feedstocks will often have different activity than their fossil counterparts and won't necessarily produce the same quantity of outputs.⁸ By basing their calculations solely on production inputs rather than outputs these methods systematically over-report the renewable share of fuels.

We encourage CARB to review the recent mass balance fraud challenges faced by the EU Renewable Energy Directive (RED) program as an example of this risk, particularly pertaining to waste feedstock attestation.⁹ In July 2023 the program discovered rampant fraudulent biodiesel submissions from China, which had been certified by ISCC mass balance. The discovery quickly "caused a dramatic fall in biodiesel prices in European markets."¹⁰ In response to this situation the EU quickly updated the RED's rules to uniformly require routine direct testing, including for producers choosing calculation based approaches to verify their calculations.¹¹

Implement Biogenic Testing Requirements for Intrastate Jet Fuels

125.4

As CARB looks to introduce intrastate fossil jet fuel to the program, we recommend that routine biogenic testing requirements be applied to these fuels as well. Routine biogenic testing requirements are the only way to reliably verify the renewable content included in mixed fuels, and therefore encourage the displacement of fossil content. Especially given the importance co-processing currently plays in the SAF industry's early development, requiring routine testing is the best way to incentivize renewable content and penalize fossil content.

Demand Legitimate Vetting From Certification Programs Leveraged by LCFS

125.5

In the workshop on these updates CARB specifically mentioned its intention to rely on existing certification programs such as "ISCC, RBS, REDcert, Bonsucro, etc." Beta would like to emphasize that not all of these certification programs are equally stringent or reliable, and encourage CARB not to rely on any certifications which would invite risk to the LCFS. It is critical that only certifications relying on internationally recognized testing standards be relied on by the program.

Beta would again urge CARB to review the recent case of fraudulent biodiesel fuels which were certified in the EU RED using ISCC mass balance. These calculations are preferred by the industry because they enable producers to systematically over-report their renewable content, allowing them to receive more government incentives and greenwash their products. We re-iterate with emphasis that these calculations ignore the fact that renewable feedstocks will often have different activity than their fossil counterparts and won't necessarily produce the same quantity of outputs.¹² By basing their calculations

⁸ 2006. "Determining the modern carbon content of biobased products using radiocarbon analysis." *Bioresource Technology*, 97(16), 2084-2090.

⁹ 2023. "ISCC Press Release July 27, 2023." *International Sustainability & Carbon Certification*

¹⁰ 2023. "ISCC Press Release July 27, 2023." *International Sustainability & Carbon Certification*

¹¹ 2023. "Renewable energy- method for calculating the share of renewables in the case of co-processing." *European Commission*

¹² 2006. "Determining the modern carbon content of biobased products using radiocarbon analysis." *Bioresource Technology*, 97(16), 2084-2090.



solely on production inputs rather than outputs these methods systematically over-report the renewable share of fuels. As a result relying on any certification based on these calculations would leave the program susceptible to embellished claims and potentially duplicated counting.

125.6

Certifications relying on mass balance such as the ISCC also allow producers to use book and claim, or free allocation, meaning they do not have to guarantee that there is any renewable content in a given fuel. Producers prefer this because if 10% of their feedstocks are biogenic they can claim that 10% of their products are biogenic, even if that's not the case because biobased can go in different amounts to different products in the co-process. Even further, book and claim also allows them to claim that 10% of their products are 100% biogenic and the rest are 0%, even if all of the products should be 10% biogenic based on calculations (and would likely C14 test below that).¹³

This system is designed to allow producers to maximize the incentives they can receive from programs such as the LCFS, without guaranteeing that they are actually providing the sustainability benefits those incentives are meant to produce. Facilities certified using these calculations are also extremely difficult to audit as a result. There are multiple facilities across the globe using successfully Carbon-14 analysis of the actual output and it is the easiest and most trustworthy method.

Certifications which rely on direct testing following internationally recognized standards, such as the Roundtable on Sustainable Biomaterials (RSB) must be prioritized to protect the integrity of the LCFS.¹⁴ As CARB considers which certifications to rely on, it is imperative that only programs which have demonstrated a commitment to creating stringent, scientifically proven frameworks be admitted.

Conclusion

125.7

California's LCFS is a critical tool for the state's decarbonization journey and an example relied on by other programs around the US and the entire world. By implementing best practices for verification established by a wide range of fuel decarbonization programs led by the LCFS, CARB can protect and strengthen its ability to successfully achieve and measure the goals of this program. Routine direct testing following ASTM D6866 Method B is the most effective way to incentivize and validate biogenic content under this program.

What is Biogenic Testing (Carbon-14)?

Carbon-14 analysis is a reliable method used to distinguish the percentage of biobased carbon content in a given material. The radioactive isotope carbon-14 is present in all living organisms and recently expired material, whereas any fossil-based material that is more than 50,000 years old does not contain any

¹³ 2024. "The Mass Balance Approach." *International Sustainability & Carbon Certification*

¹⁴ 2023. "RSB Standard for Advanced Fuels." *Roundtable on Sustainable Biomaterials (RSB)*



ISO/IEC 17025:2017-Accredited Testing Laboratory

carbon-14 content. Since Carbon-14 is radioactive, the amount of carbon-14 present in a given sample begins to gradually decay after the death of an organism until there is no carbon-14 left. Therefore, a radiocarbon dating laboratory can use carbon-14 analysis to quantify the carbon-14 content present in a sample, determining whether the sample is biomass-based, fossil fuel-derived, or a combination.

The analysis is based on standards such as ASTM D6866 and its international equivalents developed for specific end uses, such as ISO 13833. ASTM D6866 is an international standard developed for measuring the biobased carbon content of solid, liquid, and gaseous samples using radiocarbon dating.¹⁵ There are also many international standards based on the specific use of direct Carbon-14 testing, such as ISO 13833, which is an international standard developed for measuring the biogenic carbon content of stationary sources emissions.¹⁶

Carbon-14 analysis yields a result reported as % biobased carbon content. If the result is 100% biobased carbon, this indicates that the sample tested is completely sourced from biomass material such as plant or animal byproducts. A result of 0% biobased carbon means a sample is only fossil fuel-derived. A sample that is a mix of both biomass sources and fossil fuel sources will yield a result that ranges between 0% and 100% biobased carbon content. Carbon-14 testing has been incorporated into several regulations as the recommended or required method to quantify the biobased content of a given material.

ASTM D6866 Method B - The Most Reliable Method

Carbon-14 is a very well-established method which has been in use by many industries (including the fossil fuel industry) and academic researchers for several decades.

Carbon-14 measurements done by commercial third party testing is robust, consistent, and with quantifiable accuracy/precision of the carbon-14 amount under **ASTM D6866 method B**. The EN 16785 is the only standard that allows a variant of the Mass Balance (MB) method of 'carbon counting' under EN 16785-2. The EN 16785-1 requires that the biocarbon fraction be determined by the carbon-14 method. However, when incorporating this EN 16785 method, certification schemes like the "Single European Bio-based Content Certification" **only** allow the use of EN 16785-1 due to its reliability and the value of a third-party certification. <http://www.biobasedcontent.eu/en/about-us/>

In ASTM D6866 method B, the carbon-14 result is provided as a single numerical result of carbon-14 activity, with graphical representation that is easily understood by regulators, policy

¹⁵ 2021. "Standard Test Methods for Determining the Biobased Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis." *ASTM International (D6866-21)*

¹⁶ 2013. "ISO 13833:2013 Stationary source emissions: Determination of the ratio of biomass (biogenic) and fossil-derived carbon dioxide." *International Organization for Standardization*



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makers, corporate officers, and more importantly, the public. The overwhelming advantage of carbon-14 is that it is an independent and standardized laboratory measurement of any carbon containing substance that produces highly accurate and precise values. In that regard, it can stand alone as a quantitative indicator of the presence of biobased vs. petroleum feedstocks. When carbon-14 test results are challenged, samples can be rapidly remeasured to verify the original reported values (unlike mass balance).

The quantification of the biobased content of a given product can be as low as 0.1% to 0.5% (1 relative standard deviation – RSD) based on Instrumental error for Method B (AMS). This error is exclusive of indeterminate sources of error in the origin of the biobased content, and manufacturing processes. As such a total error of +/-3% (absolute) has been assigned to the reported Biobased Content to account for determinate and indeterminate factors.¹⁷

It is also important that the program should always require ASTM D6866 Method B, rather than allow Method C for any use. Where ASTM D6866 Method B uses the AMS Instrument to measure ¹⁴C, Method C uses Liquid Scintillation Counting (LSC). In Method B, the AMS Instrument directly measures the ¹⁴C isotopes. However, in Method C, scintillation molecules indirectly absorb the beta molecules that release with the decay of ¹⁴C and convert the energy into photons which are measured proportionally to the amount of ¹⁴C in the sample. Since Method B directly measures the ¹⁴C isotopes and Method C measures them indirectly, Method B is significantly more precise and should be prioritized in regulations.¹⁸ LSC measurements, like those used in Method C, are commonly used as an internal testing tool when samples are limited and accuracy does not need to be extremely high.

About Beta Analytic

Beta Analytic was among the originators of the use of Accelerator Mass Spectrometry (AMS) for the ASTM D6866 biobased / biogenic testing standard using Carbon-14 to distinguish renewable carbon sources from petroleum sources. Beta began testing renewable content in 2003 at the request of United States Department of Agriculture (USDA) representatives who were interested in Beta's Carbon-14 capabilities for their BioPreferred[®] Program (www.biopreferred.gov). At their request, Beta joined ASTM under subcommittee D20.96. Beta's previous president, Darden Hood, was positioned as a technical contact for the USDA and within 3 months completed the ASTM D6866-04 standard. The Carbon-14 technique is now standardized in a host of international standards including ASTM D6866, CEN 16137, EN 16640, ISO 16620, ISO 19984, BS EN ISO 21644:2021, ISO 13833 and EN 16785. Carbon-14 analysis can be used on various types of samples (gas, liquids and solids). Beta Analytic continues to be a

¹⁷2021. Standard Test Methods for Determining the Biobased Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis. *ASTM International (D6866-21)*. pp 1-19. doi: 10.1520/D6866-21.

¹⁸2022. "Testing the methods for determination of radiocarbon content in liquid fuels in the Gliwice Radiocarbon and Mass Spectrometry Laboratory." *Radiocarbon*



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technical contact for ASTM D6866 with current president Ron Hatfield and is involved with all their latest ASTM D6866 versions.

The Carbon-14 standardized method is also incorporated in a variety of regulatory programs including the California AB32 program, US EPA GHG Protocol, US EPA Renewable Fuels Standard, United Nations Carbon Development Mechanism, Western Climate Initiative, Climate Registry's Greenhouse Gas Reporting Protocol and EU Emissions Trading Scheme.

We are currently technical experts on Carbon-14 in the following committees:

ASTM D6866 (D20.96) Plastics and Biobased Products (Technical Advisor)
ASTM (D02.04) Petroleum Products, Liquid Fuels and Lubricants (Technical Advisor)
ASTM (061) US TAG to ISO/TC 61 Plastics (Technical Expert)
USDA BioPreferred Program TAC (Technical Advisor)
ISO/TC 61/SC14/WG1 Terminology, classifications, and general guidance (Technical Expert)
CEN/TC 411 Biobased Products
CEN/TC 411/WG 3 Biobased content
CEN/TC 61/SC 14/WG 1 Terminology, classifications, and general guidance (Technical Expert)

ISO/IEC 17025:2017 Accredited Laboratory

To ensure the highest level of quality, laboratories performing ASTM D6866 testing should be ISO/IEC 17025:2017 accredited or higher. This accreditation is unbiased, third party awarded and supervised. It is unique to laboratories that not only have a quality management program conformant to the ISO 9001:2008 standard, but more importantly, have demonstrated to an outside third-party laboratory accreditation body that Beta Analytic has the technical competency necessary to consistently deliver technically valid test results. The ISO 17025 accreditation is specifically for natural level radiocarbon activity measurements including biobased analysis of consumer products and fuels, and for radiocarbon dating.

Required tracer-free facility for Carbon-14

For carbon-14 measurement to work, be accurate, and repeatable, the facility needs to be a tracer-free facility, which means artificial/labeled carbon-14 is not and has never been handled in that lab. Facilities that handle artificial carbon-14 use enormous levels relative to natural levels and it becomes ubiquitous in the facility and cross contamination within the facility, equipment and chemistry lines is unavoidable. Results from a facility that handles artificial carbon-14 would show elevated renewable contents (higher pMC, % Biobased / Biogenic values), making those results invalid. Because of this, Federal contracts and agency programs (such as the USDA BioPreferred Program) require that AMS laboratories must be 14C tracer-free facilities in order to be considered for participation in solicitations.



To learn more about the risks associated with testing natural levels Carbon-14 samples in a facility handling artificially enhanced isotopes please see the additional information provided after this comment.

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2024. "The Mass Balance Approach." *International Sustainability & Carbon Certification* <https://www.iscc-system.org/certification/chain-of-custody/mass-balance/>

Demand a Tracer-Free Laboratory for Radiocarbon Dating

As part of its commitment to provide high-quality results to its clients, ISO/IEC 17025-accredited Beta Analytic does not accept pharmaceutical samples with “tracer Carbon-14” or any other material containing artificial Carbon-14 (^{14}C) to eliminate the risk of cross-contamination. Moreover, the lab does not engage in “satellite dating” – the practice of preparing individual sample graphite in a remote chemistry lab and then subcontracting an AMS facility for the result.

High Risk of Cross-Contamination

Pharmaceutical companies evaluate drug metabolism by using a radiolabeled version of the drug under investigation. AMS biomedical laboratories use ^{14}C as a tracer because it can easily substitute ^{12}C atoms in the drug molecule, and it is relatively safe to handle. Tracer ^{14}C is a well-known transmittable contaminant to radiocarbon samples, both within the AMS equipment and within the chemistry lab.

Since the artificial ^{14}C used in these studies is phenomenally high (enormous) relative to natural levels, once used in an AMS laboratory it becomes ubiquitous. Cross-contamination within the AMS and the chemistry lines cannot be avoided. Although the levels of contamination are acceptable in a biomedical AMS facility, it is not acceptable in a radiocarbon dating facility.

Biomedical AMS facilities routinely measure tracer-level, labeled (Hot) ^{14}C samples that are hundreds to tens of thousands of times above the natural ^{14}C levels found in archaeological, geological, and hydrological samples. Because the ^{14}C content from the biomedical samples is so high, even sharing personnel will pose a contamination risk; “Persons from hot labs should not enter the natural labs and vice versa” (Zermeño et al. 2004, pg. 294). These two operations should be absolutely separate. Sharing personnel, machines, or chemistry lines run the risk of contaminating natural level ^{14}C archaeological, geological, and hydrological samples.

Avoid the Risks

Find out from the lab that you are planning to use that they have never in the past and will never in the future:

- accept, handle, graphitize or AMS count samples containing Tracer or Labeled (Hot) ^{14}C .

- share any laboratory space, equipment, or personnel with anyone preparing (pretreating, combusting, acidifying, or graphitizing) samples that contain Tracer or Labeled (Hot) ^{14}C .

- use AMS Counting Systems (including any and all beam-line components) for the measurement of samples that contain Tracer or Labeled (Hot) ^{14}C .

Tracer-Free Lab Required

Recently, federal contracts are beginning to specify that AMS laboratories must be ^{14}C tracer-free facilities in order to be considered for participation in solicitations.

A solicitation for the National Oceanic and Atmospheric Administration (NOAA) has indicated that “the AMS Facility utilized by the Contractor for the analysis of the micro-samples specified must be a ^{14}C tracer-level-free facility.” (Solicitation Number: WE-133F-14-RQ-0827 - Agency: Department of Commerce)

As a natural level radiocarbon laboratory, we highly recommend that researchers require the AMS lab processing their samples to be Tracer-free.

No Exposure to Artificial Carbon-14

According to ASTM International, the ASTM D6866 standard is applicable to laboratories working without exposure to artificial carbon-14 routinely used in biomedical studies. Artificial carbon-14 can exist within the laboratory at levels 1,000 times or more than 100 % biobased materials and 100,000 times more than 1% biobased materials. Once in the laboratory, artificial ^{14}C can become undetectably ubiquitous on materials and other surfaces but which may randomly contaminate an unknown sample producing inaccurately high biobased results. Despite vigorous attempts to clean up contaminating artificial ^{14}C from a laboratory, isolation has proven to be the only successful method of avoidance. Completely separate chemical laboratories and extreme measures for detection validation are required from laboratories exposed to artificial ^{14}C . Accepted requirements are:

- (1) disclosure to clients that the laboratory working with their products and materials also works with artificial ^{14}C
- (2) chemical laboratories in separate buildings for the handling of artificial ^{14}C and biobased samples
- (3) separate personnel who do not enter the buildings of the other
- (4) no sharing of common areas such as lunch rooms and offices
- (5) no sharing of supplies or chemicals between the two
- (6) quasi-simultaneous quality assurance measurements within the detector validating the absence of contamination within the detector itself.

ASTM D6866-22 – Standard Test Methods for Determining the Biobased Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis.

Useful Reference

1. Memory effects in an AMS system: Catastrophe and Recovery. J. S. Vogel, J.R. Southon, D.E. Nelson. Radiocarbon, Vol 32, No. 1, 1990, p. 81-83 doi:10.2458/azu_js_rc.32.1252 (Open Access)

"... we certainly do not advocate processing both labeled and natural samples in the same chemical laboratory." "The long term consequences are likely to be disastrous."

2. Recovery from tracer contamination in AMS sample preparation. A. J. T. Jull, D. J. Donahue, L. J. Toolin. Radiocarbon, Vol. 32, No.1, 1990, p. 84-85 doi:10.2458/azu_js_rc.32.1253 (Open Access)

"... tracer ^{14}C should not be allowed in a radiocarbon laboratory." "Despite vigorous recent efforts to clean up the room, the "blanks" we measured had ^{14}C contents equivalent to modern or even post -bomb levels."

3. Prevention and removal of elevated radiocarbon contamination in the LLNL/CAMS natural radiocarbon sample preparation laboratory. Zerneño, et. al. Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms Vol. 223-224, 2004, p. 293-297 doi: 10.1016/j.nimb.2004.04.058

"The presence of elevated ^{14}C contamination in a laboratory preparing samples for natural radiocarbon analysis is detrimental to the laboratory workspace as well as the research being conducted."

4. High level ^{14}C contamination and recovery at XI'AN AMS center. Zhou, et. al. Radiocarbon, Vol 54, No. 2, 2012, p. 187-193 doi:10.2458/azu_js_rc.54.16045

"Samples that contain high concentrations of radiocarbon ("hot" samples) are a catastrophe for low background AMS laboratories." "In our case the ion source system was seriously contaminated, as were the preparation lines."



Beta Analytic

www.radiocarbon.com



May 10, 2024

Submitted to: [Low Carbon Fuel Standard Workshop, April 10, 2024 | California Air Resources Board](#)

Re: April 10, 2024 Workshop on the Low Carbon Fuel Standard Regulation

Dear Ms. Sahota:

CalETC appreciates this opportunity to **SUPPORT** the Low Carbon Fuel Standard regulation and provide feedback for CARB Board member consideration. This letter responds to issues raised in the April 10, 2024 workshop. As a reminder, on February 20, 2024, CalETC submitted two letters regarding the proposed amendments to the LCFS-- a letter on behalf of the CalETC board of directors ("utility letter") concerning issues specific to the utility interests, and a joint letter submitted with the Electric Vehicle Charging Association (EVCA) "member letter" concerning issues relevant to the entire membership.

CalETC is a non-profit association committed to the successful introduction and large-scale deployment of all forms of electric transportation including plug-in electric vehicles of all weight classes, transit buses, port electrification, off-road electric vehicles and equipment, and rail. Our board of directors includes Los Angeles Department of Water and Power, Pacific Gas and Electric, Sacramento Municipal Utility District, San Diego Gas and Electric, Southern California Edison, and the Northern California Power Authority and the Southern California Public Power Authority. Our membership also includes major automakers, manufacturers of zero-emission trucks and buses, developers and operators of charging stations and other industry leaders supporting transportation electrification. CalETC supports and advocates for the transition to a zero-emission transportation future to spur economic growth, fuel diversity and energy independence, ensure clean air, and combat climate change. Please note that the views and comments reflected in this letter represent the positions of the CalETC board of directors and some, but not all, of the members of CalETC.

Over the past 10 years, the LCFS has been tremendously successful in supporting the transition from petroleum to cleaner transportation fuels including electricity fuel. Clean fuels have replaced petroleum and, in doing so, have reduced climate change pollutants as well as a myriad of air and toxic pollutants that adversely impact communities. The LCFS has served as a catalyst for billions of dollars of investments in clean fuels and infrastructure and is critically needed to meet CARB's Scoping Plan.

Regarding the feedback requested in 4/10/24 LCFS workshop slide 49, CalETC offers the following comments:

126.1

CalETC supports the proposed carbon intensity targets in Table 1 (e.g., 30% in 2030 and 90% in 2045).

126.1
cont.

CalETC applauds staff for aligning the proposed Table 1 requirements with CARB's Scoping Plan vision. As discussed in our February member letter, this is an important step toward providing industry and stakeholders with the certainty needed for LCFS to be a successful tool for planners, implementers, and investors. However, based on the information provided during the 4/10/24 workshop and from comment letters posted in February 2024, we offer two new recommendations that are necessary to provide a smooth/sustained market signal to support deeper decarbonization in the 2030s, and meet near-term market needs:

1. *CalETC recommends a 9 percent step down in the carbon intensity in Table 1 when the updated LCFS takes effect.*

126.2

In our February member letter, we provided a detailed justification regarding our support for a step down when the updated LCFS begins. Based on the workshop slides and accompanying files, we now believe a nine percent step down is warranted to address near-term market needs. The credit bank is currently on track to be 30 million credits or more by the end of 2024. A step down of 7% is likely to reduce the bank by approximately six million credits which is not enough of a draw down to stabilize the market. That is why CalETC supports strong step down of at least nine percent, which is likely to reduce the bank by sixteen million credits. A nine percent step down is the best and most efficient way to quickly relieve this glut in credits and get the market back on track so that it can efficiently incentivize low carbon fuels and reduce emissions.

2. *CalETC recommends an average quarterly deficit ratio of 2.0 in the automatic acceleration mechanism (AAM).*

126.3

In our February member letter, we provided a detailed justification regarding our support for an automatic acceleration mechanism and recommended that the earliest start date for it be 2027 instead of 2028. Based on workshop slides and the reasons provided in the AJW February letter to CARB, we also recommend the trigger for the AAM be an average quarterly deficit ratio of 2.0 rather than the proposed regulation's 3.0. CalETC asserts that a quarterly deficit ratio of 3.0 is overly conservative. For example, as noted in the comments submitted on February 19, 2024, by AJW, a ratio of 3.0 would not have triggered the AAM in 2022, when the LCFS was not delivering its potential emission reductions.

126.4

CalETC recommends the LCFS Final Statement of Reasons provide a step-by-step explanation of how workshop slide 8 was calculated and the assumptions used. As shown, this slide can be misunderstood, taken out of context, or used to show that incentives for DCFC are no longer needed. For these reasons CARB should provide the detail behind this slide in a public document.

In response to questions CalETC has received, we and some of our members provide in Appendix A an explanation of the benefits of LCFS to all utility customers (ratepayers) and how utilities have spent and plan to spend their LCFS revenues.

CalETC appreciates the opportunity to provide comments on this important regulation. If you have any questions, please do not hesitate to contact me at any time.

Best,

A handwritten signature in black ink, appearing to be 'LR', followed by a horizontal line.

Laura Renger
Executive Director

cc: Matthew Botill
Jordan Ramalingam
Jacob Englander

Appendix A. Overview of Utility LCFS Holdback Spending and Benefits of LCFS to All Utility Customers (Ratepayers)

This summary is for the holdback LCFS funds for SDG&E, SCE, SMUD, LADWP, small utility members of NCPA and PG&E. The statewide Clean Fuel Reward funded by utilities' LCFS funds provided over 386,000 rebates for on-the-hood electric vehicles. In the past, utility LCFS spending has dedicated approximately 37% of its funds to equity programs, however, with the new staff proposal that will increase to about 80% including holdback and statewide programs.

SDG&E has returned approximately \$27M to over 43k customers via a bill credit program that ran from 2018 – 2021. SDG&E is currently in the process of ramping up our Pre-Owned EV Rebate Program. The program is slated to launch in Q2 2024 and is estimated to spend approximately \$17M over a three-year program period. The program targets income-qualified customers with a \$4K rebate for the purchase or lease of a pre-owned electric vehicle. A \$1k rebate is offered to non-income qualified customers.

SDG&E is evaluating ideas for new/additional customer offerings that will promote transportation electrification, prioritizing equity, and affordability. However, the type of programs that SDG&E will pursue is contingent upon final LCFS amendments; specifically, recategorization of SDG&E as a medium IOU (which would lead to an increase in holdback funds available) and the final list of priority projects (which will determine which ideas are eligible). The types of priority offerings that SDG&E is considering include, but are not limited to:

- Bill credits and/or charging cards
- Rebates for residential (single-family and multi-unit dwelling) charging infrastructure
- Financial literacy and advisory services
- Vehicle-grid integration, including pilots, research, and development

SCE is using LCFS base credit revenues to fund programs and services that help incentivize EV adoption and address air quality needs for low-income customers and customers in disadvantaged communities. Using LCFS to help fund programs and services makes it easier for customers to adopt electric vehicles and is also the most cost-effective way to reduce customer's total energy costs including gasoline and diesel. These LCFS revenues helps reduce total energy costs for customers by enabling utilities, like SCE, to fund certain transportation electrification programs and services that typically are not included in the traditional utility ratemaking processes, such as incentives for customer-side infrastructure and vehicle rebates.

Since 2017, SCE has distributed over \$250 million of LCFS credit proceeds to customers in its service area – \$141 million as part of the California Clean Fuel Reward and \$114 million in SCE's independent programs (holdback LCFS) - providing rebates towards the purchase of more than 290,000 electric vehicles. Starting this year, SCE is expanding its offerings of LCFS-funded projects to include rebates and support for non-vehicle TE equipment as well as additional vehicle incentives. SCE's portfolio of current and proposed LCFS-funded projects consists of the following:

- Pre-owned EV rebate program – In market since 2021, provides a rebate on the purchase or lease of a used EV, including a \$4,000 incentive for low-income drivers

- Charge Ready Home – Launched in March 2024, provides eligible low-income customers with a rebate up to \$4,200 for a home electrical panel upgrade and necessary circuit to support EV charging
- Zero Emission Truck, Bus, and Infrastructure finance program – expected to launch in June 2024 will provide better capital access for fleet electrification in partnership with the California Treasurer’s Office
- Drayage truck rebate – expected to launch in June 2024, will support the electrification of ~5% of the drayage trucks in SCE’s service area
- Subsidized public EV charging for low-income EV drivers – pending approval from the California Public Utilities Commission
- Customer-side infrastructure rebates for public heavy-duty truck charging – pending approval from the California Public Utilities Commission
- EV Maintenance Technician Training – pending approval from the California Public Utilities Commission.

Between authorized and programs pending CPUC authorization, SCE expects to spend approximately \$375 million in LCFS Holdback credit revenues through 2027. Eighty percent of this funding is for programs and services that benefit equity communities. Using LCFS to help accelerate TE adoption allows customers to reduce their reliance on expensive fossil fuel alternatives and reduces total energy costs for residential and commercial consumers. It also increases total electric system utilization, which directly applies downward pressure on electricity rates, benefiting all electricity customers, not just EV drivers. LCFS is significantly more impactful when used to accelerate TE adoption and buy down related costs, as opposed to non-targeted electric bill credits, especially within equity communities.

SMUD: LCFS funding promotes electric transportation and provides savings for SMUD’s ratepayers. Transportation electrification (TE) is a key component of the state’s decarbonization goals and SMUD’s 2030 Zero Carbon Plan. The LCFS program provides crucial funding for utilities to expand equitable access to EVs and electric mobility options – a key component of SMUD’s EV strategy – and contributes to downward pressure on SMUD’s rates. We estimate LCFS-funded investments provided \$67 million in total ratepayer savings since 2020 through direct program benefits, rate savings, and offsetting infrastructure costs.

Ratepayer benefits are expected to substantially increase based on CARB’s proposed regulatory changes. SMUD prepared a preliminary model that utilizes CARB’s projection of LCFS credit prices and makes conservative assumptions about other costs and benefits. For the period 2024 through 2041, the model indicates that LCFS-funded investments, including programs and distribution grid upgrades, will provide ratepayers with approximately \$1.1 billion in total ratepayer savings¹ (2020 dollars) – an annual average ratepayer offset of approximately 6.05%.

¹ Note that these results are still preliminary and do not account for any emission reduction benefits, include benefits from commercial and industrial customers electrifying, or indirect benefits (e.g., economic benefits from workforce development programs). Estimates provided here may be conservative compared to future results.

SMUD's LCFS programs have encouraged EV adoption and EV charging equipment deployment. Since 2020, SMUD has invested approximately \$26 million of LCFS revenue in a variety of TE focused programs aimed at encouraging EV adoption and incentivizing the development of EV charging infrastructure.

Example programs include:

- Residential incentives for dedicated EV circuit upgrades, charging equipment, and including circuit sharing devices through SMUD's Charge@Home program – including no-cost direct installations for income-qualified customers
- Commercial incentives for dedicated EV circuits and charging equipment, including panel and transformer upgrades, for fleets, nonprofits, and multifamily buildings
- Community education "Ride and Drive" events, conducted in partnership with Charge Across Town, with a portion of these within under-resourced communities
- Dealership engagement, in partnership with Plug In America, to provide training and incentives to encourage EV adoption and increase awareness of SMUD incentives.

Future spending will focus on improving the customer charging experience, increased investments in equity communities, and grid upgrades to support long-term electric transportation growth. SMUD is investing in expanding the availability, affordability, and reliability of EV charging with emphasis on equity communities, multifamily properties, and workplaces. SMUD expects to substantially ramp investments in EV charging and grid infrastructure serving low-income neighborhoods and equity communities – including those that speed electrification of commercial medium- and heavy-duty fleets, which disproportionately impact equity communities. Other planned equity investments involve upgrade and expansion of SMUD-owned charging stations, support for additional eMobility hubs, increased community education, and workforce development programs to address the need for a trained workforce for EV charging infrastructure. SMUD additionally expects to make significant investments in managed charging to offset the cost of distribution grid upgrades to support growing transportation electrification loads and to keep our rates among the lowest in California.

LADWP

Program	CY 2019	CY 2020	CY 2021
Commercial EV Charger Rebate Program	\$13,500,000	\$22,542,000	\$1,241,000
Education and Outreach	\$968,000	\$756,000	\$688,000
City EV Infrastructure (Non-DWP)	\$1,550,000	\$20,000	\$21,000
EV Charging Electric Billing	\$109,000	\$101,000	\$148,000
Residential EV Charger Rebate Program	\$642,000	\$619,000	\$983,000
Used EV Rebate Program	\$258,000	\$1,164,000	\$1,252,000
LADWP EV Infrastructure	\$2,230,000	\$3,749,000	\$2,628,000
DCFC Rebate Program	\$1,000	\$7,000	\$17,000
Annual Total	\$19,258,000	\$28,958,000	\$6,978,000



ladwp.com

In 2022 and 2023 LADWP spent the following:

- Residential Rebate Program: \$804,945 and \$1,166,892
- Commercial Rebate Program: \$611,581 and \$94,130
- Used EV Rebate Program: \$1,030,732 and \$2,067,970
- LADWP EV Infrastructure: \$1,621,726 and \$0
- Public EV Charging Electricity: \$399,973 and \$158,222
- Education and Outreach: \$389,339 and \$171,426
- Statewide Clean Fuel Reward Contribution: \$9,236,195 and \$9,561,317
- Total LCFS Credit Proceeds Expenditure: \$14,097,674 and \$13,221,179

Regarding future plans: up To \$34.1M for MOUs with Los Angeles City and County agencies to fund electric transportation projects over the next five years, \$57.9M in pending rebate applications for projects in various stages of completion, expected to be paid out in the next two years from various funding sources, including LCFS.

Small Utility Members of Northern California Power Agency (NCPA)

Examples of current LCFS holdback programs (through 2023):

- City-owned EVSE infrastructure for public and City fleet use
- EV charger rebates for residential low-income, commercial & multifamily properties

- Technical Assistance Program for multifamily and businesses
- Vehicle rebates up to class 8 vehicles
- Educational webinars focused on EV charging for multifamily properties and EV charging for businesses
- Electric bike rebate program and an e-bike share program
- Income qualified pre-owned electric vehicle rebate program
- in-house electric vehicle charging rebate program for residents, multifamily, schools and nonprofits
- Funded community ride share EV program in partnership with City
- ZEV plans, ZEV bus plans
- EV education web tool
- Maintenance of existing public chargers

Planned LCFS holdback programs:

- Continue existing rebate programs (or start programs for smaller utilities)
- EV school bus program
- EV submeter program
- Subsidized public charging for LMI customers program
- Fleet advisory services for commercial industrial customers
- Infrastructure upgrade rebates
- Managed EV charging program
- V2G incentive pilot
- Auto dealership partnership program
- Charging as a service
- Educational programs on charging and rates
- Targeted educational programs for low-income
- Incentives and financing options for residential EV charger installations
- Other innovative technologies or pilots that support transportation electrification



LCFS Fuels EV Adoption & Ratepayer Benefits

Delivering significant benefits to PG&E customers

LCFS represents a unique opportunity to support transportation electrification without using ratepayer funding, and over a quarter of a million vehicles for customers in nearly every corner of PG&E's service territory have already benefitted.

316,640

Number of EVs supported by LCFS programs
(54% of all EVs registered in PG&E's territory)

\$254,700,000

Incentives paid to PG&E customers by LCFS programs

44

Number of California counties with customers receiving LCFS-funded incentives through PG&E

Driving downward pressure on rates

Funding a portion of PG&E's EV programs through LCFS rather than through ratepayer funding saved the average customer an estimated \$39.40 on their bills from 2016-2023 – about \$5 per year. As a result, PG&E was able to offer hundreds of millions of dollars in customer incentives and support with no upward impact to customer electricity bills.

Instead, these investments help to further accelerate downward pressure on electric rates, as EVs represent a significant source of electricity load growth. PG&E's costs from running the electricity system are spread across many more kilowatt-hours of usage, meaning less money that needs to be recovered through each kilowatt-hour. A 2022 California-specific analysis from Synapse Energy Economics show that EVs contribute far more in revenue than in added costs, which helps to drive down rates across EV owners and non-EV owners alike.¹

Additional Resources

¹ Synapse Energy Economics, "[Electric Vehicles Are Driving Electric Rates Down](#)," December 2022.

² Consumer Reports, "[EVs Offer Big Savings Over Traditional Gas-Powered Cars](#)," October 2020.

All other statistics are from analyses using PG&E program data.

PG&E's EV Savings Calculator: ev.pge.com

EV Rates and eGallon information: www.pge.com/evrateplan

Active LCFS-funded programs:

- Pre-Owned EV Rebate: evrebates.pge.com
 - Residential Charging Solutions: www.pge.com/rcsrebate
 - Multifamily & Small Business Direct Install: www.pge.com/msevcprogram
- 2023 Implementation Plan with new proposed programs: [Advice Letter 7071-E](#)



LCFS Benefits Equity Customers

Supporting transportation & energy affordability

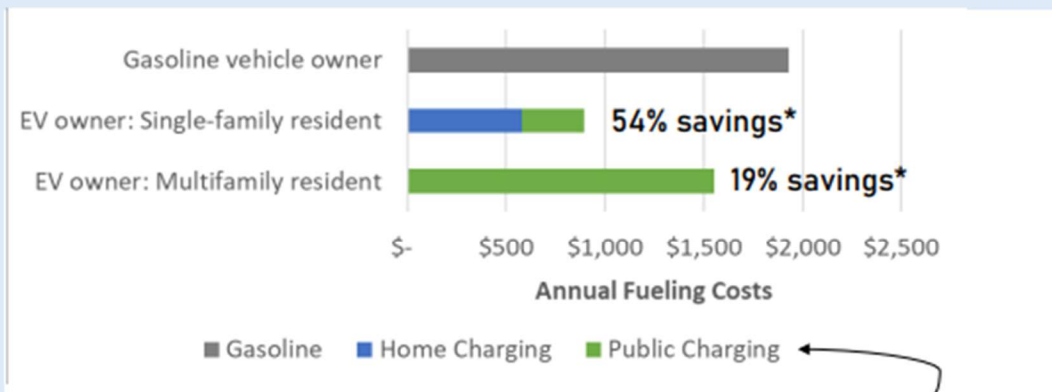
It's a myth that low-income drivers aren't in EVs. Participation in PG&E's programs proves that many of these customers are switching to electric, and an increasing focus on supporting these customers through LCFS-funded programs helps them make this transition and save.

- LCFS-funded programs have provided incentives to over 21,000 California Alternative Rates for Energy (CARE) reduced rate customers and 14,000 customers living in Disadvantaged Communities within PG&E's service territory.
- Income-qualified EV buyers make up 33% of all rebates paid through PG&E's Pre-Owned EV Rebate program, which provides rebates for used EV purchases/leases.
 - 16% of survey respondents indicated they made less than \$50,000 a year.
- Renters make up 23% of the Pre-Owned EV Rebate recipient pool.

Income-qualified customers can take advantage of a \$4,000 rebate for a pre-owned EV and a \$700 rebate for a charging station – both funded by LCFS – and a \$2.10 eGallon price when combining the CARE reduced rate with PG&E's EV-2A rate. Proposed LCFS programs will add a prepaid debit card for public charging worth up to \$50 a week, and \$4,000 for panel upgrades.

How EVs are already helping vulnerable customers

EVs cost half as much to maintain as gasoline vehicles² and can cost 15%-50% less to fuel. By taking advantage of the CARE rate and off-peak EV charging rates and stacking incentives from PG&E's LCFS programs and other federal/state/local offerings, income-qualified customers can reduce the purchase cost of an EV and start realizing ongoing savings sooner.



*One of PG&E's proposed LCFS programs would pay for up to two years of public charging for income-qualified customers – up to a 100% savings for those dependent on public charging.

May 10, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95814
VIA ONLINE SUBMISSION

RE: Low Carbon Fuel Standard Potential Amendments

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- Transport distance for delivery – fewer than 100 miles traveled for final delivery, based upon industry reporting and best practices.

Previous letters to CARB, which highlight the errors in modeling through the Lookup Table Pathways, have yet to be substantively addressed by staff.

AIR & WATER QUALITY BENEFITS OF TRANSITIONING TO PROPANE

127.3 The current CI of renewable propane ranges from half- to one-quarter the CI of California's electric grid – and new sources are lower still. Like conventional propane, renewable propane has no methane. Therefore, it does not suffer leakage issues or fugitive GHG emissions like natural gas. It also does not run the risk of groundwater or soil intrusion from spills like liquid fuels or degrading electronic waste, such as batteries or solar panels.

¹ https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/ca-greet/lut_update_2023_2.pdf

² WPGA, Comment Letter, RE: GREET4.0 – Propane Carbon Intensity Calculation, Submitted to CARB April 29, 2023

³ Backes, S. E., Beath, J., Sebastian, B., & Hawkins, T. R. (2020, September). Sources of Propane Consumed in California. Chicago; Argonne National Laboratory.

127.3
cont.

There would be great air quality benefit to transitioning from fuels with significant air emissions like CARBOB (California gasoline blend), natural gas, and diesel, to the no-SOx, no-black-carbon, and ultra-low-NOx solution of renewable propane. To meet 2022 Scoping Plan goals and other emission reduction mandates such as the State Implementation Plan (SIP), renewable propane serves as the bridge fuel to meet timeline goals in fuel sectors where electric technology is not yet affordable nor feasible. It is the perfect fuel for hard to decarbonize areas and sectors of the state, like off-road and heavy-duty transportation. Renewable propane can be prioritized in underserved communities where adequate electric infrastructure is not afforded to them or where service is intermittent due to power shutoffs and natural disasters.

TRANSPORTATION EMISSIONS, SUSTAINABILITY, AND BOOK & CLAIM

127.4

Acknowledging that the transportation of fuel is included in the CI, ideally renewable propane production would be in California. There are already in-state facilities producing renewable propane, with additional sources coming rapidly online. One source is Global Clean Energy, which utilizes the energy-rich cover crop camelina seed: currently qualified as an LCFS compliant fuel. While many renewable diesel and sustainable aviation fuel (SAF) plants produce renewable propane, it is currently being utilized onsite to lower the CI of other existing LCFS-compliant fuels. This limits the amount of renewable propane on the market.

127.5

The proposed sustainability audit presented by CARB staff during the April 10th public workshop would be costly for farmers to adopt and creates another barrier to entry for promising new intermediate crop feedstocks like camelina. Intermediate crops are harvestable cover crops grown on existing farm acres during the otherwise idle or fallow period, providing soil health and climate-smart benefits. Camelina is an intermediate crop harvested to create ultra-low carbon renewable fuel feedstocks for renewable propane, as well as other renewable fuels.

127.6

In addition to the cost concern, the proposal would establish a precedent about sustainability outside the purview of the LCFS regulation, such as the review of economic sustainability of the applicant (e.g., farm) and the review of social practices (e.g., worker treatment). We encourage further dialogue and industry participation before sustainability audit criteria are adopted.

127.7

WPGA proposes that CARB apply its Book & Claim and avoided emissions reporting to renewable propane. While renewable propane is currently only deliverable in California by truck or rail, CARB, through amendments, has the capacity to generate enhanced distribution and use of renewable propane. Given renewable propane's low CI score, CARB could, through adopting its Book & Claim and avoided emissions framework, play an instrumental role in lowering the CI score in California and increasing production to offset fuels with larger air quality or GHG emissions footprints.

Similar to its provisions pathway for renewable biomethane, CARB could develop a provisional pathway for avoided emissions for renewable propane.

- One pathway would involve booking propane produced outside of California, and exchanging for renewable propane produced in California, allowing a lower CI score to avoid the added CI for transmission.
- A second proposed provisional pathway would account for reduced or nominal CI additions for renewable propane shipped by rail or truck, as renewable propane should not be excluded by a failure of useful infrastructure.

CARB has a unique potential to stimulate renewable propane production and demand, while lowering CI scores and improving environmental justice communities, all by providing for Book & Claim and avoided emissions accounting for renewable propane. Through this process, CARB

127.7
cont. can ensure the best available fuel for all communities and uses, while also lowering the CI score of the fuel utilized.

STREAMLINE PATHWAY APPROVAL PROCESS FOR DELIVERY MODELS

Alongside Book & Claim efforts, there are other steps that CARB can take that would improve the supply and usage of renewable propane within California. WPGA proposes that CARB adopt a streamlined approval process for the following additional delivery models of fuel:

- 127.8 1) Pathways that would incentivize production of electricity used in the charging of battery electric vehicles: Currently, renewable and conventional propane can be used in fast-charging mobile or stationary applications to charge battery electric vehicles across many classes. Offering a streamlined pathway to incorporate the delivery of already-approved renewable propane to these charging applications is directly in line with existing LCFS intent and will provide greater reliability for electric vehicle charging networks within California.
- 127.9 2) Updated GREET model (and/or pathways) that incorporate the usage of renewable fuels or technologies within the transportation of renewable propane for delivery. In-state transportation emissions could further be reduced by using renewable propane to fuel the vehicles involved in transportation and delivery. WPGA is working with vendors to bring ultra-low-NOx renewable propane-powered Autogas vehicles to the California market to supplant diesel. CARB could create a streamlined process to incorporate those reductions in the CI of transportation within the CI of the fuel itself.

CONCLUSION

With approximately 15% of all propane used in transportation being renewable today, the industry has a goal of reaching 100% renewable propane across California's propane transportation market by 2035 or sooner. WPGA remains committed to transitioning its fuel within California and bringing additional resources to the non-transportation markets served by our members.

WPGA appreciates the opportunity to submit feedback on the LCFS potential amendments.

Sincerely,



Krysta Wanner
Manager of Government Affairs, WPGA
krysta@westernpga.org

May 10, 2024

California Air Resources Board
1001 I St.
Sacramento, CA 95814

RE: 3Degrees Comments in Response to April 10, 2024 Workshop on the Low Carbon Fuel Standard

Dear California Air Resources Board (CARB) Staff,

Thank you for the opportunity to provide comments in response to the April 10, 2024 Workshop. 3Degrees Group Inc. (“3Degrees”) is a global climate and clean energy solutions provider and is a strong supporter of the LCFS program. We participate in the program as a designated reporting entity on behalf of a variety of opt-in parties with light-duty electric vehicle (EV) chargers, electric forklifts, hydrogen forklifts, and heavy-duty EV fleets. We are also an active fuel pathway developer.

3Degrees appreciates the time and effort that Staff has put into engaging the public and crafting these updates to the program over the last few years. Our recommendations for the LCFS proposed rule are outlined below.

128.1 **Based on extensive modeling and current market data, 3Degrees strongly recommends that CARB implement a 9% step-down in 2025 and allow the Auto Adjustment Mechanism (AAM) to be triggered as early as 2026.**

Ahead of the April 10th workshop, CARB provided modeling input and output data for several scenarios as it works towards new CI target proposals: a 5%, 7%, and 9% step-down in 2025. After modeling CI reductions that will likely be achieved over the next few years of the program and applying assumptions based on current trends and fuel supply forecasts, our conclusion is that a 9% step-down is not only feasible but necessary to maintain the momentum of electrification required to meet the state’s GHG reduction goals.

CARB’s modeling assumptions generally aligned with our modeling, with the following exceptions:

- 128.2 (1) *ARB assumes that all ZEV mandates will be met exactly on time, which we believe may be hindered by supply chain constraints.*

128.1 cont. As CARB stated in the workshop, the LCFS is included in analyses for ZEV regulations as part of economic support for ZEV deployment and operation, and the proposed amendments to the program are designed to support ZEV regulations. As such, it is important that the LCFS sends adequate price signals to foster the adoption of ZEVs

across those sectors with electrification mandates. This reinforces the need to maximize the stringency of the step-down.

(2) The CI that CARB applied for renewable diesel is significantly higher than what has historically been reported.

128.2
cont.

We expect more renewable diesel to enter the California market over the next several years. CARB assumes that the renewable diesel CI will average 60 g/MJ by 2025. However, Q4 data shows that the 2023 average CI was only 42.47 g/MJ. While the average CI increased 15% in 2023 compared to 2022, the highest reported average CI since the start of the LCFS program was 53 g/MJ in Q1 2016. Using CARB's larger CI value to model credit generation and credit bank withdrawal leaves millions of credits unaccounted for. By 2036, the number of credits generated with CARB's assumed renewable diesel CI will be roughly half of what they would be using the 2023 average CI. Using CARB's assumed CI, renewable diesel becomes a deficit generator in 2033. However, using the most recent data, this will not occur until 2037. A higher average CI also means that banked credits are withdrawn faster.

128.1
cont.

The Q4 2023 data recently released by CARB show that the program is already exceeding compliance targets by 4%. Further, the program has been reducing CI by ~3% per year since 2021. If this rate continues, the CI reduction will be 21% by 2025, nearly reaching the 9% step-down proposed and exceeding the 2030 target reduction. If more accurate assumptions are applied when modeling future performance, it becomes even clearer that a 9% step-down is warranted and needed to stabilize the market.

128.3

In line with our February 20, 2024 comments in response to the release of the draft rule, we would advocate again that the AAM should be able to be triggered earlier, in 2026. In concert with the step-down, this would lead to fewer surplus credits through the late-2020s and would likely result in the higher prices needed to drive investment, thus mitigating pricing volatility with a smoother path towards more ambitious targets.

128.4

3Degrees urges CARB to maintain the technology-neutral principles of the program by providing an agnostic methodology for phasing-out any credit generation opportunities. Implementing artificial and arbitrary cuts to specific technologies and fuel types threatens the integrity of the entire program.

Proposed changes to Energy Economy Ratios (EERs)

128.5

We would like to reiterate our previous comments that Staff's proposal to adjust the EER for zero-emission (ZE) forklifts with lift capacities less than 12,000 kg to decrease credit generation opportunities for this technology introduces unnecessary regulatory risk to the LCFS program. This crediting limitation is founded on incorrect assumptions about ZE forklift adoption rates and turnover, and it sets a dangerous precedent for the reduction of other credit generation opportunities that could threaten the ability to meet program targets as the ambition of CI reduction rates increases.

128.5
cont.

More generally, manipulating the EER, defined by CARB as “the dimensionless value that represents the efficiency of a fuel as used in a powertrain as compared to a reference fuel used in the same powertrain,” to discount particular technologies or fuels is unjustifiable. If CARB must phase out any credit generation opportunity, this should only occur via a well-defined, data-driven methodology that accurately accounts for market saturation and other relevant factors. As stated in our February comments on the proposed rule and in responses to prior workshops, the LCFS should provide an off-ramp or other provision geared at a smooth and predictable transition out of the program.

128.6

Further, in the Initial Statement of Reasons released with the draft rule in December, Staff states that they are “revising the baseline for battery-electric forklifts by incorporating the 2010 status of forklift electrification into the baseline.” If CARB is going to shift the baseline at this late point in the program (more than 14 years after its inception), Staff should implement the same baseline across all technologies. The key point is that a lack of clarity on how other equipment types will be treated under the LCFS as they gain traction may result in reduced investment in these technologies, making it more difficult for the program to achieve its long-term goals.

Potential changes to biofuel eligibility

128.7

California will not meet its LCFS targets, nor overall GHG reduction goals, without the use of biofuels. Without biofuels, as CARB acknowledged at the workshop, reliance on much more destructive and carbon intensive fossil fuels increases. In line with our comments above, we recommend that CARB not limit the opportunity for biofuels to generate credits in the LCFS program. The appropriate place to account for any impacts of biofuel production is in the indirect land use change scoring system.

3Degrees encourages CARB to consider incentivizing Climate-Smart Agriculture (CSA) practices within the LCFS program.

128.8

Accounting for the carbon reduction benefits of CSA practices within the LCFS would have widespread benefits for the state. One of the goals delineated by Staff at the workshop was the need to “Reduce other impacts of agricultural practices in feedstock production.” The best way to promote sustainability in the production of crop-based feedstocks used for low-carbon fuel production is to account for the additional GHG reduction benefits evidenced by climate-smart farming techniques, for example, using biochar for carbon sequestration where coproducts might be used as fuels.

128.9

In line with comments submitted by other stakeholders, we request that CARB incorporate the CI reductions of CSA practices within the next update of the CA-GREET model to allow for LCFS pathways to sufficiently credit processes that enable feedstock to be produced in a less carbon intensive manner. Should this require that CARB undertake research and analysis to develop a methodology for incentivizing CSA, 3Degrees would be happy to help provide data and advise Staff on this important initiative.

We urge CARB to finalize this rulemaking as soon as possible.

128.10

We deeply appreciate the work that Staff are doing to update the LCFS rule and understand that CARB has many high-priority and urgent rulemakings to contend with this year. However, we've seen that even rumors of further delays can have significant impacts on the market, and strongly recommend that CARB push to have an approved rule before the end of this year.

3Degrees appreciates this opportunity to provide feedback and we look forward to continuing to work with CARB on the success of the LCFS program. Please reach out with any questions or for further discussion.

Sincerely,

/s/ Helen Kemp

Helen Kemp
Policy Manager, Regulatory Affairs
hkemp@3degrees.com

May 10, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95814
VIA ONLINE SUBMISSION

RE: Low Carbon Fuel Standard Potential Amendments

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WPGA appreciates the opportunity to submit feedback on the LCFS potential amendments.

Sincerely,

A handwritten signature in black ink that reads "Krysta Wanner". The signature is fluid and cursive, with the first name "Krysta" and last name "Wanner" clearly distinguishable.

Krysta Wanner
Manager of Government Affairs, WPGA
krysta@westernpga.org



May 10, 2024

Carolyn Lozo
Chief, Transportation Fuels Branch
California Air Resources Board
1001 "I" Street
Sacramento, CA 95814

Via electronic submission

Re: Proposed Low Carbon Fuel Standard Amendments

Dear Transportation Fuels Branch Chief Lozo:

CoverCress Inc. (CCI) is a scientifically advanced, forward-thinking company focused on developing a climate-smart agricultural product that contributes to the reduction of greenhouse gas emissions through both sequestration and mitigation. In 2013, CCI was born out of ambition and the need to pursue a renewable and sustainable energy source for fuel and feed.

CCI has converted field pennycress through advanced breeding and use of gene editing tools to create a climate-smart agricultural product marketed under the trade name of CoverCress®. This renewable oilseed and animal feed crop has a winter annual growth cycle, allowing it to fit into an existing corn and soybean rotation as a revenue-generating functional cover crop. It is planted in the fall, vernalizes over the winter, flowers, sets seed in the spring, and is harvested just ahead of spring crop planting. Because it is grown in the winter in between a traditional corn and soybean rotation in the Midwest, it does not compete for acres used in crop production currently and is an incremental feedstock input for the production of renewable fuels such as renewable diesel and sustainable aviation fuel. CCI has recently been honored to be recognized as one of the top green tech companies as determined by TIME, and as the winner of Bloomberg New Energy Finance Pioneers 2024 in the category of "Creating the Next Generation of Net-Zero Fuels".

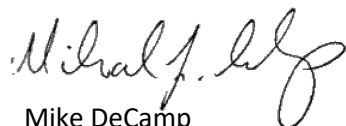
CoverCress® grain is crushed, like other oilseed crops, producing low carbon intensity CoverCress® oil as a feedstock to produce renewable fuels. The resulting meal is utilized as a high-protein source of animal feed. CoverCress oil has a low carbon intensity score less than tallow and similar to used cooking oil using current LCFS models and methodology.

CCI is proud to be part of the Integrated Pennycress Research Enabling Farm & Energy Resilience Project (IPREFER), a team of public academic researchers, extension/outreach specialists, agricultural producers and commercial interests working to optimize off-season pennycress oilseed production. This public/private collaboration has received major Coordinated Agricultural Project (CAP) funding from USDA-NIFA. As a result of ongoing research and commercialization efforts, the recent update to the

Department of Energy's Billion Ton Report¹ identified pennycress oil feedstock as a significant contributor of potential biomass supplies from agriculture needed to fuel the bioeconomy.

130.1 CCI applauds the innovative California Low Carbon Fuel Standard (LCFS) as a program that has driven a significant reduction in greenhouse gas emissions in California industry through the use of renewable fuels. CCI plans that CoverCress oil will one day be a significant contributor of a renewable oil feedstock included in the LCFS program. As the California Air Resources Board (CARB) considers updates to the LCFS program, emerging companies such as ours likely need to plan for capturing information that are proposed as needed for the program in order to support the supply chain pathway for renewable fuel feedstocks. We urge CARB to carefully consider what sustainability programs are currently in place and use that as a base to identify gaps. We also urge CARB to build on existing sustainability programs in order to minimize additional costs for our farmer partners to comply with these programs thus driving more use of these new climate smart agricultural crops. We know from experience that overly burdensome requirements beyond those required to verify agricultural practices could lead to a reduced participation rate that would ultimately slow adoption and the overall benefits to the environment and society. In addition, we urge CARB to fully consider that feedstocks from newly commercialized crops such as CoverCress, grown on fallow or idle land between rotations of primary crops and acting as functional cover crops, should be afforded negative LUC values in the updated LCFS, as has been calculated in published, peer reviewed studies. Feedstocks from these new crops are incremental, additive sources of material without driving any land use change. Processing of these crops adds other materials, such as animal feeds, into our economy that helps decrease the risk of land use changes globally. Finally, we want to express appreciation for CARB's decision to reject an arbitrary cap on crop-based fuels in the December 2023 45-day package. We need all solutions for a lower greenhouse gas emissions future, and we believe crop-based fuels are an integral part of California meeting its carbon reduction goals.

Sincerely,



Mike DeCamp
CoverCress Inc CEO

¹ Hellwinckel, C., D. de la Torre Ugarte, J. L. Field, and M. Langholtz. 2024. "Chapter 5: Biomass from Agriculture." In *2023 Billion-Ton Report*. M. H. Langholtz (Lead). Oak Ridge, TN: Oak Ridge National Laboratory. doi: 10.23720/BT2023/2316171.

May 10, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95814

Via Online Submission: <https://ww2.arb.ca.gov/rulemaking/2024/lcfs2024>

Comments on April 10 LCFS Workshop

Dear California Air Resources Board (CARB) Low Carbon Fuel Standard Program Staff:

Thank you for the opportunity to provide comments in response to the Low Carbon Fuel Standard (LCFS) workshop on April 10, 2024. We appreciate CARB hosting workshops and engaging stakeholders' input on a variety of forward-looking concepts for the future of the LCFS. Taking decisive action to bolster the LCFS market will help ensure the long-term viability of the program and the accomplishment of the state's carbon reduction objectives. SkyNRG Americas ("SkyNRG") is pleased to be able to provide comments on several areas of LCFS policy.

SkyNRG has been engaged in enabling sustainable aviation fuel (SAF) as a solution to decarbonize aviation since 2009. Starting in 2019 we initiated the construction of new dedicated SAF production facilities to support the aviation industry's 2050 net-zero commitments with new SAF capacity globally. Critically, SAF is one of the few cost-effective and scalable tools for decarbonizing aviation in the near-to medium-term. As such, SAF is one of few viable solutions for California to mitigate aviation emissions in the foreseeable future.

For our SAF project development efforts in the US, SkyNRG will be among the first producers of SAF and renewable diesel (RD) at-scale sourced from cellulosic feedstocks such as biomethane or renewable natural gas (RNG). SkyNRG's SAF production process is anticipated to use RNG sourced from a variety of sources and secured from common carrier pipelines on a mass balance accounting basis similar to producers of other clean fuels such as compressed natural gas (CNG), or liquid natural gas (LNG) do currently in California. Importantly, SAF produced from RNG also doesn't compete with food-based crops or create indirect land use challenges.

As other industries and transportation sectors decarbonize utilizing electrons and other low carbon fuel sources, aviation as a proportion of California's total greenhouse gas footprint will continue to increase through 2035 and beyond. The aviation sector is one of the most difficult industries to decarbonize due to unique operational and safety requirements that necessitate liquid energy-dense fuels, highlighting the critical role of low-carbon liquid fuels such as SAF for the future of the sector.

SAF is an essential contributor to achieving Governor Newsom's goal of 20% clean fuels for the aviation sector by 2030. However, delaying supportive low carbon policies that enable SAF in the LCFS now will jeopardize the industry's ability to scale SAF production in the timeframe needed to meet the Governor's goal in the future. SAF production facilities can take five to seven years to move from development to operation; consequently, construction of new projects (or expansions of existing facilities) must begin now to enable these solutions to be available by 2030.

131.1

SkyNRG submits the following comments related to the air quality benefits of SAF, the auto adjustment mechanism, one time step adjustments and the importance of flexibility around the mass balance accounting of RNG for the production of SAF.

Air Quality Opportunities from SAF

After virtually attending the April workshop, we were moved by the testimony and diverse perspectives of airport workers, as represented by the Service Employees International Union (SEIU) and their support for clean fuels such as SAF. While air travel remains crucial in our society, we commend CARB staff for recognizing more needs to be done to protect the health and safety of these workers and airport communities. Fully addressing aviation's impacts requires a committed approach to reducing both carbon dioxide (CO₂) and non-CO₂ emissions and there is a growing body of data that SAF offers this in both cases.

131.2

While research is ongoing, it is clear that SAF not only releases less CO₂ during combustion, but also releases up to 80% less soot into the atmosphere as compared to conventional jet fuel (kerosene).¹ Recent findings from research by the University of Manchester in the United Kingdom have found that emissions from the combustion of sustainable aviation fuels, as compared to fossil jet fuel, reveal a profound reduction in these emissions. Ultrafine black carbon at low thrust, which directly impacts local air quality, was 45% less in number and 80% less in mass for every kilogram of blended sustainable aviation fuel burnt.²

In 2022, the Dutch National Institute for Public Health and the Environment (RIVM) released a report on the health effects of long-term exposure to ultrafine particles (smaller than 0.1 micrometer) from air traffic around the Amsterdam Schiphol Airport.³ Specifically, RIVM examines the effects that air traffic has on, *inter alia*, the cardiovascular system, respiratory tract, and nervous system, as well as general health and mortality. Although further study is required to fully understand the long-term health effects, there is a clear correlation between air traffic and the worsening of pre-existing conditions such as asthma as well as an increased potential for cardiovascular disease, which, according to the World Health Organization (WHO), is the leading cause of death globally.⁴

As CARB considers further changes to the LCFS, we encourage more study of the local air quality conditions surrounding California's major airports and the benefit of SAF use to these communities. This presents an opportunity for collaboration with the aviation sector and airport workers to support the accelerated uptake of currently available solutions like SAF to help mitigate both health and climate impacts in the near- and long-term.

2025 Stepdown Scenarios

Since its implementation over a decade ago, the LCFS has proven highly successful in both encouraging market investment in low carbon fuels and lowering emissions in the transportation fuel sector. To help ensure a healthy LCFS credit market that can keep pace with these investments, we strongly support

131.3

¹ <https://www.dlr.de/en/vt/research-transfer/fag/fag-sustainable-aviation-fuels>

² <https://www.manchester.ac.uk/discover/news/using-sustainable-aviation-fuels-could-reduce-emissions-by-up-to-80-scientists-find/>

³ <https://open.overheid.nl/documenten/ronl-af341f669119e9edbbd2a6ed78f68a7eaa7c9fae/pdf>.

⁴ https://www.who.int/health-topics/cardiovascular-diseases#tab=tab_1.

131.3 cont. CARB's plans to strengthen the existing emission targets for 2030 and beyond. Therefore, we encourage CARB to adopt the 9% near-term stepdown presented during the April workshop, thereby recognizing the carbon intensity (CI) reduction successes of the program over the previous years. This aligns with the findings of the consulting firm ICF, which suggests an optimal stepdown range of 10.5% to 11.5% for 2025 and targeting a credit bank size equivalent to two quarters worth of deficits. By making appropriate adjustments, CARB can reflect the strong market supply scenario, thereby fostering the development of additional solutions to further drive down the state's emissions with SAF.

Auto-Acceleration Mechanism

131.4 We also are strongly supportive of the introduction of an auto-acceleration mechanism (AAM) to strengthen CI reduction targets and respond to growth in the low carbon fuels sector. By recognizing and rewarding overperformance in the program, California benefits from the latest growth and expansion of low carbon fuel technologies. Therefore, it is essential the AAM functions properly in tandem with the CI adjustment. Private industry has signaled its readiness to exceed stated goals well ahead of schedule, as evidenced by the achievement of 2026 goals ahead of schedule in 2023 and significant credit bank builds each quarter. Consequentially, we believe the AAM should not be restricted to an every-other-year frequency and adopt an annual review basis. This enables the AAM to promptly respond to the emerging market rather than potentially being two years behind schedule.

131.5 Additionally, we support triggering the AAM no later than 2026 and at a lower trigger level. This will guard against the case where the near-term target stepdown is not sufficient to address the current oversupply. The AAM mechanism should be triggered when the credit bank is two times greater than quarterly deficits. If the AAM conditions are met, the corrective mechanism should be able to trigger as soon as possible (i.e., using the 2025 data).

131.6 As the private sector continues to develop new low CI fuels, stringent and attainable targets ensure California as a desirable market for these fuels, thereby continuing a legacy of the state's leadership in transforming fuel supply and reducing greenhouse gas (GHG) emissions. Therefore, it is essential to properly adjust the CI targets to give the AAM the best chances of functioning as intended and to continue to showcase California as a leader in the energy transition.

Expanding Not Limiting Mass Balance Accounting of RNG

131.7 As stated in previous comments to CARB, expanding opportunities for RNG to be used as an input for additional transportation fuels such as SAF and RD will be critical to achieving more stringent targets. The share of LCFS credits generated for RNG-based fuel, primarily renewable CNG, has steadily grown over the last decade thanks in large measure to the ultra-low CI scores attainable for feedstocks such as dairy and livestock wastes. This trend may be unsustainable long-term, however, if RNG opportunities are not encouraged beyond their current applications due to the limited scale of on-road heavy duty natural gas vehicle (NGV) fleets.

Existing LCFS regulations incentivize the use of RNG in renewable CNG and LNG applications by offering the flexibility of mass balance accounting of RNG injected into pipeline systems connected, sometimes at great distance, to downstream production or dispensing locations (sometimes referred to as "book-and-claim"). This is a highly effective way to rapidly decarbonize transportation fuels, and we encourage this to be expanded to SAF and RD as it has been applied to other transportation fuel end uses like CNG, and LNG.

The U.S. RNG industry has evolved with existing regulatory programs at both the federal and state levels that reasonably recognize that most sources of RNG do not justify co-location of fuel production facilities. To accommodate this challenge, mass balance accounting is an indispensable ingredient to incentivizing the development of RNG resources and unlocking their emission reduction potential to materially reduce emissions.

Under the current LCFS regulations, SkyNRG (and others) would be unable to participate in the expansion of the program because there are no provisions allowing mass balance accounting for offsite RNG utilized as feedstock to produce SAF and RD. We are discouraged that CARB introduced deliverability requirements for RNG that restrict the ability to utilize this low carbon feedstock, rather than expanding its applicability. Geographic and deliverability limitations would almost certainly stifle investment in RNG resources and reduce opportunities for the state to achieve its LCFS-specific climate goals. Respectfully, we believe that CARB's stated goal should be to harmonize mass balance accounting policies for low CI electricity and RNG. This current approach overlooks the fundamental difference of RNG as a feedstock and its application in novel technologies such as SAF, potentially inhibiting its growth. Additionally, as noted in our previous comments, we take issue with the approach of applying the Renewables Portfolio Standard (RPS) deliverability requirements that are specific to electricity generation as they are not fit for purpose for RNG as a transportation fuel or feedstock.

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cont.

The U.S. Environmental Protection Agency (EPA) has recognized the potential for RNG as a feedstock in the production of renewable fuels. In its 2023 rulemaking, the EPA established a regulatory framework allowing the use of RNG as a "biointermediate," paving the way for producers like SkyNRG to make renewable, low carbon fuels like SAF and RD from products derived from RNG under mass balance accounting (once finalized). Critically, the EPA's regime leverages indirect accounting of pipeline injection and offtake at separate points consistent with LCFS mass balance accounting procedures. In CARB's ISOR for the proposed rule change, the need to align with federal support for SAF proliferation is specifically highlighted as a guiding principle of the rule change.

The LCFS program has long been compatible with federal incentives, including the Renewable Fuel Standard (RFS) and numerous tax credits. The creation of additional federal incentives through the Inflation Reduction Act (IRA) and Infrastructure Investment and Jobs Act (IIJA) only increases the opportunity for the LCFS program to align with and leverage federal investments to accelerate decarbonization. While the SAF market is growing, these incentives are greatly needed and have outsized impacts in supporting the industry's maturation. CARB should ensure that the LCFS program aligns with the treatment of SAF feedstocks under the RFS to avoid creating a bifurcated RNG market. Further, given the intention to align and coordinate LCFS programs in California, Oregon and Washington and further accelerate the uptake of SAF, we also encourage CARB to consider Washington state's approach to enabling book and claim accounting for RNG to SAF.

In summary, we implore CARB to expand eligibility for mass balance accounting of all sources of RNG as feedstock to produce transportation fuels like SAF and RD. Doing so will create new opportunities to utilize RNG to make low, or even negative, CI transportation fuels that are suitable for sectors that are hard to decarbonize in California, directly contributing to Governor Newsom's ambitious goals for expanded production and use of low carbon, renewable aviation fuels. With appropriate oversight (including the verification and validation procedures CARB already requires), we believe that any compliance risks can be effectively managed as they are today for CNG, LNG, and hydrogen production. By recognizing the potential of RNG as an SAF and RD feedstock, CARB acknowledges its material value

131.7 cont. to a maturing industry and instills confidence in investment communities to continue to invest in the energy transition sector. Limiting mass balance accounting eligibility for RNG feedstocks is a critical issue that may significantly negate California's ability to benefit from the next generation of low carbon fuels.

Further Study on Changes to Avoided Methane Emissions Credits is Necessary

As SkyNRG continues to build out SAF production capacity in the US, the company will continue to explore a wide range of RNG feedstock opportunities from organic waste streams, including food waste, yard and landscaping waste, industrial and wastewater sludge, and a variety of animal wastes in the coming decades. Many untapped waste streams are novel as it relates to LCFS pathways, but nonetheless can readily be converted to transportation fuels through technologies that are commercially proven and readily suitable for producing low carbon fuels from RNG pathways.

131.8 CARB should continue to encourage the capture and productive repurposing of methane emissions from organic waste streams processed through anaerobic digestion, regardless of the source of the waste stream or when this waste is produced. To this end, and as noted in previous comments, SkyNRG encourages CARB to avoid making changes in the present amendments that limit opportunities to include avoided emissions in CI calculations. We do not believe that a premature sunset is appropriate in achieving LCFS success as these sources of methane emissions are directly tied to population growth and expanded food production. Therefore, we believe that this warrants further study from CARB to avoid any unnecessary consequences as currently proposed since methane sources will continue to increase in the future.

The GHG emission reductions resulting from CNG fleets being the default for many medium- and heavy-duty applications are attributed, in part, to the incentives of the LCFS and has resulted in improved air quality for constituents. SAF is at a similar crossroads. By allowing for avoided methane crediting for RNG as a feedstock, CARB has the potential to see SAF become the default fuel for aviation, much like the transition in the CNG fleet space. RNG has continued potential to reduce GHG emissions in California, and recognizing its potential as a feedstock is essential to the continued success of the program.

131.9 We encourage CARB to study the success of Europe's Renewable Energy Directive (RED), which has long recognized the avoided methane benefits when assessing the lifecycle CI of various RNG pathways. The RNG to SAF pathway presents a unique opportunity to scale-up low carbon fuels in the aviation sector to align with California's recently stated goals of obligating jet fuel within the LCFS.

Thank you for the opportunity to comment on the proposed changes to the LCFS. SkyNRG applauds California's leadership and CARB staff for taking action to drive innovation and growth of low carbon fuel technologies. Through careful consideration of the impact of these rule change to a developing industry, we believe SAF can help take the LCFS to new heights.

Sincerely,

A handwritten signature in blue ink, appearing to be 'J. Plaza'.

John Plaza
President & CEO
SkyNRG Americas, Inc.



CALIFORNIA ASSOCIATION of SANITATION AGENCIES

925 L Street, Suite 200 • Sacramento, CA 95814 • TEL: (916) 446-0388 • www.CASAweb.org

May 10, 2024

Matt Botill, Division Chief
Industrial Strategies Division

Cheryl Laskowski, Branch Chief
Transportation Fuels Branch

California Air Resources Board
1001 I Street
Sacramento, CA 95814

Submitted electronically via: <https://ww2.arb.ca.gov/public-comments/low-carbon-fuel-standard-workshop-april-10-2024>

Re: California Association of Sanitation Agencies Comments on the Low Carbon Fuel Standard
Proposed Regulatory Revisions

Dear Mr. Botill and Ms. Laskowski:

The California Association of Sanitation Agencies (CASA) appreciates the opportunity to provide comments on the proposed revisions to the Low Carbon Fuel Standard (LCFS) as discussed during the April 10, 2024, public workshop. CASA continues to urge CARB to carve out the wastewater sector to preserve the use of and credit for our non-fossil renewable wastewater-derived biomethane (biogas) in the LCFS program indefinitely. The wastewater sector will continue to produce and capture biogas, as well as strive to beneficially use (not waste) it for as long as we are performing the essential public service of wastewater and solids treatment with anaerobic digesters. However, removal of the avoided methane credit will render co-digestion projects at WRRFs within California financially infeasible and inadvertently drive co-digestion projects out-of-state. We made similar arguments during the Scoping Plan Update and the more recent development of the Advanced Clean Fleet (ACF) regulations. In fact, the CARB Board included language in the last paragraph of the adopted [Resolution 23-13](#) accompanying the adoption of the ACF Regulations directing staff to work with sister regulatory agencies and CASA to ensure multiple long-term uses of wastewater-derived biomethane. We urge that collaborative process to begin as soon as possible.

CASA is an association of local California wastewater agencies, known as Water Resource Recovery Facilities (WRRFs), engaged in advancing the recycling of wastewater into usable water, as well as the generation and beneficial use of renewable energy, biosolids, fuel, and other valuable resources. Through these efforts we help create a clean and sustainable environment for Californians.

Our members are focused on helping the State achieve its climate change mitigation mandates and goals, which include:

- Reducing short-lived climate pollutant (SLCP) emissions by accepting and co-digesting diverted organic (food) waste from landfills pursuant to SB 1383
- Reducing carbon intensity of transportation fuel by using the biogas we generate
- Providing 100 percent of the state's energy needs from clean and renewable sources
- Increasing soil carbon and carbon sequestration by land applying biosolids and supporting the Healthy Soils Initiative, Climate Smart Strategy, and Wildfire and Forest Resilience Action Plan

As we have noted in previous discussions and comment letters for both the ACF and LCFS regulations, the wastewater sector represents an important in-state partner for meeting SB 1383 organic waste diversion requirements and for development of low-carbon fuels. As documented in the State Water Board's [Co-digestion Capacity Analysis](#) assessing co-digestion capacity at WRRFs, the estimated total available wastewater digester capacity is capable of receiving all food waste required to be diverted from landfills in California for co-digestion. This will exponentially increase the biogas produced and captured at WRRFs.

The wastewater sector is aligned with LCFS program goals, notably to diversify transportation fuels away from fossil fuel-based sources and achieve carbon neutrality. The biogas generated not only provides a reliable low carbon fuel, but its use safeguards our communities by fueling vehicles that service infrastructure critical to protecting public health and the environment in all geographical dispositions and in response to major events, including planned power outages. CASA continues to disagree with the proposed phase-out of avoided methane crediting for both biomethane and hydrogen pathways, as well as the eventual phase-out of credit for biomethane as a transportation fuel which currently supports and will continue to support wastewater sector fleets in maintaining essential public services of wastewater collection and treatment to protect public health and the environment in the absence of ZEV options and to meet the need for immediate reductions to meet SIP requirements in non-attainment zones for ozone (a priority in the South Coast).

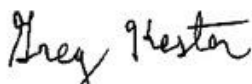
Without considering the full life cycle of biogas to renewable biomethane and hydrogen fuels and the support from the LCFS Program, these projects become financially infeasible, members will be forced to flare a renewable resource, we will not meet near-term SIP requirements in critical air basins, and members will no longer be able to accept diverted food waste in support of achieving SB 1383 mandates for methane reductions.

We strongly urge CARB to preserve the use of our biogas as a viable low carbon fuel in perpetuity since it will always be produced and successful SB 1383 implementation hinges on its beneficial use. Similarly, the proposed ACF Regulations will also inhibit SB 1383 implementation by limiting the use of medium- and heavy-duty trucks using WRRF biogas-derived compressed natural gas to only those in our fleets as of January 1, 2024 – we have proposed that be extended to follow the implementation of SB 1383 and provide WRRFs a pathway for use of the increased biogas. As CASA noted in our comments on the proposed ACF Regulations (and CARB staff acknowledged this in their December 12, 2022, presentation), medium- and heavy-duty electric trucks and vehicles unique to the needs of our sector are not commercially available and we do not expect them to be for many years. Likewise, biogas-to-hydrogen as a transportation fuel for these vehicles is not yet commercially available or demonstrated, both research and demonstrations are necessary to advance that technology and we have offered to work with CARB on those efforts. In the meantime, state regulations and policy should promote biogas deployment using proven technology that most efficiently reduces GHGs to mitigate climate change while also complying with the Omnibus regulations. RNG vehicles also greatly improve air quality in environmental justice communities. Not being able to use them will result in prolonged and increased use of diesel trucks which create 90% worse air quality.

We appreciate this opportunity to comment and your willingness to consider our recommendations. We look forward to continued collaboration to develop pragmatic solutions to these issues. Please let me know if we can set a time to meet for discussion of our recommendations. I can be contacted at

gkester@casaweb.org or at 916-844-5262 and Sarah Deslauriers can be reached at sdeslauriers@casaweb.org or at 925-705-6404.

Sincerely,

A handwritten signature in black ink that reads "Greg Kester". The signature is written in a cursive, slightly slanted style.

Greg Kester
Director of Renewable Resource Programs

cc: Adam Link, Executive Director, CASA
Sarah Deslauriers, Director of Air, Climate, & Energy Programs, CASA
Rajinder Sahota, CARB
Anil Prabhu, CARB
Charlotte Ely, SWRCB
Chris Hyun, SWRCB
Zoe Heller, Director CalRecycle
Mark de Bie, CalRecycle
Cara Morgan, CalRecycle

May 10, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Comments on April 10th LCFS Workshop

Dear California Air Resources Board:

We are writing to provide comments on the LCFS Workshop that was held by CARB staff on April 10, 2024. Thank you for considering our views on this important issue.

Darling Ingredients is North America's largest purveyor of waste fats and oils and is a 50% owner of the nation's largest renewable diesel production facility through a joint venture. Most of the fats that Darling Ingredients processes from its North American factories (used cooking oil and animal fat) are used as feedstocks for domestically produced renewable diesel. We have collection, recycling, and processing operations at several locations in California¹. According to CARB, our renewable diesel reduces greenhouse gasses (GHGs) by as much as 80%, particulate matter by 30%, and NOx by 12%. Renewable diesel is compatible up to 100% in all existing vehicles, equipment, and infrastructure and can be further processed into sustainable aviation fuel (SAF).

After reviewing the workshop materials, we have several comments we would like to share.

CA-GREET 4.0 Correction

133.1 The tailpipe emission factors for NOx and CH4 in CA-GREET 4.0 attributed to renewable diesel contain material inaccuracies. Although staff acknowledged the problem during the workshop, the subsequent correction was also inaccurate. The original error should be adjusted by 2.74 gCO2e/MJ rather than 4.78 gCO2e/MJ. This inaccuracy artificially increases the carbon intensity of renewable diesel and warrants immediate corrective action.

Carbon Intensity (CI) Benchmarks

133.2 Remedying the persistent decline in LCFS credit values demands more robust measures than have been included in the proposed regulatory package. While the amendments represent progress and a good faith effort to get the program back on track, a 5% step down in 2025 lacks the ambition required to address the ongoing challenges linked to overcompliance and a historically high credit bank.

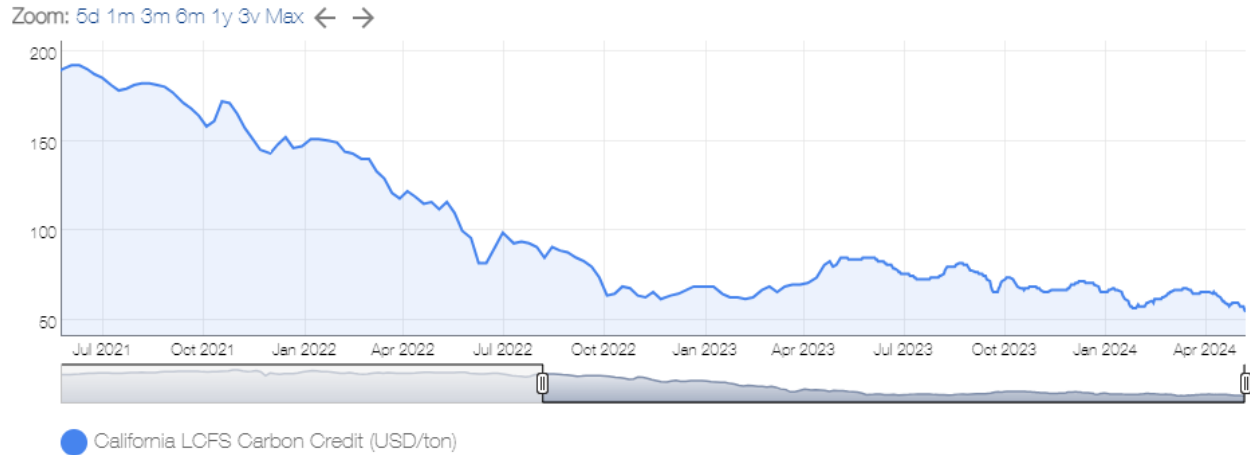
Based on internal modeling, the 9% reduction option presented at the workshop represents the absolute minimum needed to restore a reasonably healthy balance to the credit market.

¹ Fresno, Los Angeles, San Diego, San Francisco, Santa Ana, and Turlock.

133.2
cont.

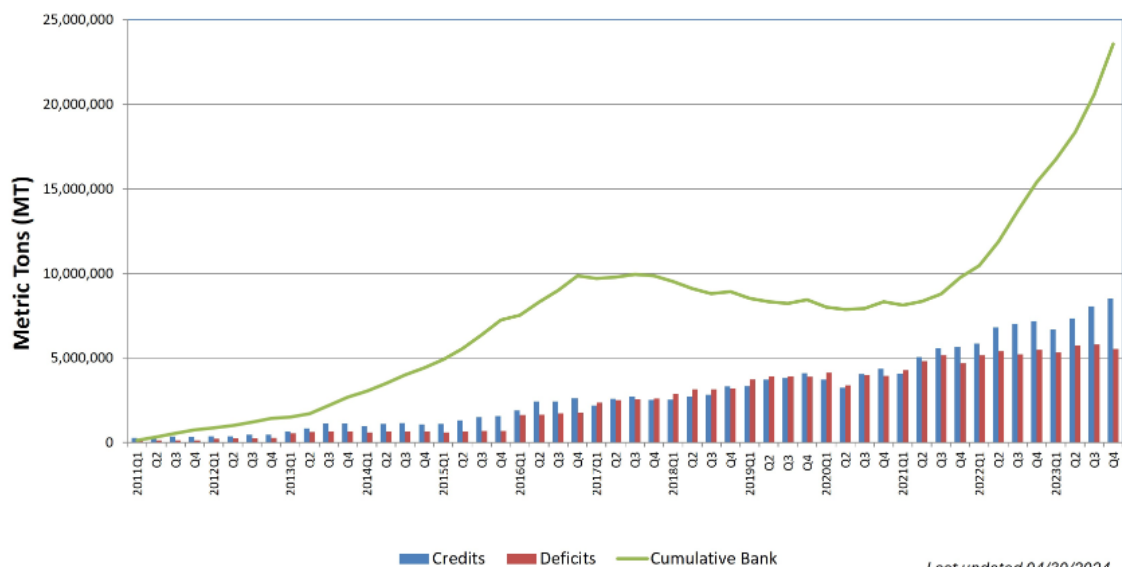
The following three charts illustrate key points supporting the case for higher ambition beginning on or before January 1, 2025.

The chart below shows that credit prices have declined from approximately \$190/MT in May of 2021 to about \$55/MT in May of 2024. This means low carbon intensity renewable diesel that earned a credit in the range of \$1.40 per gallon in 2021 would only earn about \$0.40 in today's market.



The chart below illustrates the over performance of the LCFS since program inception, but particularly since 2021. During the 2021 - 2023 timeframe, the credit bank increased from approximately 8 million MT to more than 24 million MT. The credit bank is now forecasted to exceed 30 million MT by the beginning of 2025. While, in one sense, this represents a remarkable success story, it also harbors the potential for significant negative consequences if prompt and decisive action is not taken to restore equilibrium to the system.

**Total Credits and Deficits for All Fuels Reported and Cumulative Credit Bank
Q1 2011 – Q4 2023**



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cont.

The chart below shows that credit prices have declined even further following the April 10th workshop, highlighting ongoing concerns related to uncertainty around the implementation timeline and the near-term ambition of the program.



To address these challenges, Darling has previously recommended increasing the 2025 step-down from 5% to at least 10.5%. **While the 9% option presented at the workshop is clearly a step in the right direction, we continue to maintain that 10.5% is the necessary minimum threshold to bring the credit bank back in line with historical averages.** Additionally, for the 2030 benchmark, we propose a requirement of at least 35%. Implementing these measures would position the program for stability and innovation, both in the short and long term.

133.3

CARB Leadership

We would like to thank CARB staff for its dedication to managing a thorough, inclusive, and data-driven process. Darling has been involved in LCFS regulatory processes since the program's inception and we have never witnessed staff develop a more extensive set of data or modeling results to support its proposals. Californians are fortunate to have such a knowledgeable and dedicated team of professionals working to protect the state's public health and environment. We strongly encourage staff and the board to continue embracing CARB's historical role as the global leader in low carbon fuels policy.

Once again, thank you for considering our comments. If you should have any questions, please feel free to contact me at any time at shelby.neal@darlingii.com.

Sincerely,



Shelby Neal
VP - Renewables & Energy Policy

May 10th, 2024

Matt Botill
Chief, Industrial Strategies Division
California Air Resources Board
1001 I Street, Sacramento, CA 95814

Mr. Botill and CARB Staff,

I am pleased to write on behalf of Generate Capital, PBC ("Generate") regarding the current rulemaking process to update and strengthen the Low Carbon Fuel Standard ("LCFS"). Generate is a leading sustainable infrastructure company based in San Francisco. Generate builds, owns, operates, and finances infrastructure solutions for clean energy, transportation, water, waste, agriculture, and smart cities. Founded in 2014, Generate partners with technology- and project-developers to deliver affordable, reliable, and sustainable resources to over 2,000 customers, companies, communities, school districts and universities.

- 134.1 Over the last several years, Generate has written many letters to CARB proposing or endorsing various policy elements of a revamped LCFS. We commend you and CARB Staff for consistently being open to feedback from a wide variety of stakeholders with – often strong – opinions of what an ideal LCFS program would look like. In this letter, we will continue to offer feedback on next steps, but the underlying emphasis of this letter should be unequivocal: **it is time to finalize this process**. The first meeting CARB hosted on potential changes to the LCFS program was in
- 134.2 October 2020, when LCFS credits priced at \$195/MT and the credit bank was under 8 million; credits are currently \$48/MT and the credit bank has ballooned to 23 million. Pricing continues to fall as the market simply does not believe CARB will ever take action. Investment in projects has ceased. Operating projects are shuttering. It is time.

We urge CARB to finalize this rulemaking with a vote at the June or July board meeting.

- As such, the areas we will offer our perspectives on in this letter are much more limited than in prior rounds of comments. This is a credit to CARB staff, who have sufficiently iterated on and refined the proposed changes to the point that what we are now discussing are largely technical matters. While there are other areas such as technology neutrality that are core to why we have
- 134.3 invested in LCFS-linked projects, we feel as though we have offered our fully developed thoughts in prior commentary. The areas we will focus on in this letter include:

- The changes to the diesel baseline and its impact on credit supply and demand, and;
- The 2025 CI step-down and the 2030 CI target.

We would be happy to discuss these and other aspects of the LCFS program with CARB staff. We are committed to the ongoing success of the LCFS program, of California's Scoping Plan, and to the decarbonization of our economy at scale. Thank you for your hard work on these goals and towards California's continued leadership in the fight against climate change.

Sincerely,



Asher Goldman
Vice President
Generate Capital

CARB's solution to offset the increase in diesel's baseline CI value included a key flaw, making the solution inadequate to address the increase in the credit bank expected from this change; the CI reduction targets should be increased to fully counteract the change in the baseline

In our prior letter to CARB following the publication of the ISOR, we flagged that the increase to diesel's 2010 baseline effectively reduced the ambition of the LCFS program and would be expected to result in a larger credit bank, reduced credit pricing, and reduced investment in projects. At the April 10 Public Workshop, we were pleased to see that CARB moved to address this, incorporating offsetting changes to the CI scoring of biomass-based diesel products. In the presentation used during the workshop, CARB noted that "[a]n adjustment in the RD/BD CI scores to reflect the same change to both is included in the modeling". At the time, we had believed that the adjustment being incorporated by CARB would functionally increase the CI scores of these fuels by 4.78g/MJ, which would have been a satisfactory outcome.

Upon further review and discussion with other market participants, it has become apparent that this view was not entirely correct. The 4.78g/MJ increase applied to biomass-based diesel's CI scores had been calculated from the revised modeling of tailpipe emissions of methane, nitrous oxide, and carbon dioxide. Our understanding is that the increased carbon dioxide would not be counted here as it is considered biogenic. As a result, the actual applied change to biomass-based diesel fuels' CI scores would be just 2.74g/MJ.

This is material to the supply-demand balance in the LCFS market. Assuming no change in biomass-based diesel volumes from Q4 2023 (a bad assumption given the huge volumes of renewable diesel coming online in 2024), the change from a 4.78g/MJ adjustment to a 2.74g/MJ adjustment would yield an extra 650,000 MT of credit production in 2025; through 2040, this would be expected to be **worth 10M MT of incremental credit production**.

Throughout the rulemaking process, CARB staff has continually demonstrated a commitment to science-based reasoning underpinning each decision made. We applaud this; the fact-based approach allows investors like us to have confidence in CARB to oversee and administer this program in a consistent, level-headed manner. As such, we do not want CARB to adjust the CI scores of biomass-based diesel fuels any more than the rigorous modeling already performed suggests reflects the fuels' real-world lifecycle emissions. Instead, we would like to see CARB consider this mechanical increase in credit production (and corresponding relaxation of the LCFS's stringency) as you set the step-down magnitude. **Our estimate is that this change is equivalent to reducing the 2025 step-down by ~2% and we suggest increasing the step-down's magnitude accordingly.**

For both the 2025 step-down and the 2030 target, CARB must substantially increase the ambition of the LCFS program in order to reaffirm the LCFS as a program that attracts and rewards long-term capital investment and infrastructure development

Two weeks ago, CARB published data from Q4 2023 showing a 17.3% achieved CI reduction¹. That puts the program roughly achieving the program's targets *for 2028*. We at Generate specialize in climate investing, and we cannot point to another decarbonization program that has so wildly outpaced its targets. As CARB is aware, the consequence of that rapid success

¹ California Air Resources Board. *LCFS Quarterly Data Spreadsheet*. April 2024.

has been a collapse of the market price of LCFS credits in the face of substantial excess supply; at present, **LCFS credit prices are the lowest they have been since 2015.**

The market is demanding more ambition than what has been proposed to date, including that from the April 10 Public Workshop. Pricing has fallen nearly 30% since the publication of the workshop documents containing the revised step-down values². The remedy for this is greater ambition for both the 2025 step-down as well as for the 2030 CI reduction target.

In the April 10 workshop, we noted in our oral remarks that we would include details of why we viewed a 5% step-down for 2025 to be inadequate. Since then, Q4 2023 data showing nearly 3m MT of excess credits has made this point even clearer. With a 5% step-down, we would expect a continued rapid build in the credit bank – more than doubling over the next 3 years – and an immediate triggering of the Auto-Acceleration Mechanism. It isn't hard to see why: the achieved CI reduction increased by over 4% from Q4 2022 to Q4 2023, and at the end of 2023 that metric sits just 1.5% below where a 5% step-down would place the CI target for 2025. No matter which forward-looking assumptions we use, we get to a 5% step-down being woefully inadequate.

The 7% step-down proposed in the April 10 workshop is also insufficient. While we had initially thought that 7% would be fine, the 2023 Q4 data release combined with the previously discussed error in the adjustment to biomass-based diesel fuels' CI scores pushes this step-down level outside of the range that would balance the market. Our modeling shows an early AAM triggering if this were the chosen step-down and a continued build to the credit bank for the next several years.

Considering the latest data and the other adjustments CARB has communicated in this rulemaking process, our view is that a *minimum* of a 9% step-down is needed to avoid the AAM being triggered, and that a 10% or 11% step-down not only must be considered but are the lowest values at which we would anticipate the credit bank being worked down over time. Each of these scenarios includes CARB maintaining the view that the 30% 2030 target is set. We know that there may be a degree of “sticker shock” to the numbers suggested; CARB must realize, however, that the real sticker shock is seeing credits trade *below \$50/MT*. **At present pricing, the LCFS program is not a catalyst for investment.** In each of our prior letters to CARB, we have strongly recommended implementing the step-down in 2024 – a year in which we now believe there will be more than 12m MT added to the credit bank – to avoid the increased magnitude in the step-down that would be needed if CARB waited until 2025; given the delay in this rulemaking, **these levels of action are not only justified but are necessary.**

Alternatively, CARB could choose to adjust the 2030 CI reduction target and lessen the need for as large of a 2025 step-down. If CARB were to adjust the 2030 target to 32%, a 9% step-down would be adequate to promote a stable investing environment. With a 35% 2030 target, a 7% step-down becomes viable. As we have discussed in prior letters, these two adjustments to the CI schedule interact with one another and CARB has the ability to lessen the necessary magnitude of the change in one category by increasing the change in the other. Regardless of the specific values chosen, it is clear that this aggregate magnitude of targets is needed.

² Argus Media. *CA LCFS Spot Price*. Accessed May 2024.

Closing Comments

While there are other areas where we have interest in CARB adjusting the current proposal – particularly the AAM and RNG treatment, which we have commented on several times in prior letters – we believe that those considerations must be secondary at this stage to CARB finalizing the implementation of this rulemaking with an appropriate level of programmatic ambition. For years, we have collaborated with CARB and other market stakeholders in an effort to form a more perfect LCFS program, and we seem to be approaching the resolution of that process. It is vital for it to result in a program that can once again attract the needed investment to decarbonize California’s transportation system with speed and scale.

To reach that end state, the core adjustments from the latest proposal we request are:

- Finalizing the LCFS rulemaking at the June or July CARB board meeting;
- Including a 2025 CI step-down of at least 9% and ideally 11%, and;
- Increasing the 2030 CI reduction target to at least 32%;

Generate appreciates the opportunity to provide commentary and suggestions, and we look forward to collaborating with CARB on finalizing this process. Should you have any questions about the information contained herein, please do not hesitate to contact us.

May 10, 2024

Liane Randolph
Chair
California Air Resources Board
P.O. Box 2815
Sacramento, CA 95812
Via electronic submission

RE: Growth Energy Comments on April 10th LCFS Workshop

Chair Randolph:

Thank you for the opportunity to provide written comments regarding the proposed Low Carbon Fuel Standard (LCFS) amendments. Growth Energy is the world's largest association of biofuel producers, representing 97 U.S. plants that each year produce more than 9.5 billion gallons of renewable fuel; 119 businesses associated with the production process; and tens of thousands of biofuel supporters around the country. Together, we are working to bring better and more affordable choices at the fuel pump to consumers, improve air quality, and protect the environment for future generations. We remain committed to helping our country diversify our energy portfolio in order to grow more green energy jobs, decarbonize our nation's energy mix, sustain family farms, and drive down the costs of transportation fuels for consumers.

Growth Energy has previously submitted extensive comments demonstrating the vital role low carbon biofuels and higher biofuel blends can play in meeting California's ambitious climate goals. As we have previously noted, biofuels have been among the largest contributors to the success of the LCFS program to date and are poised to continue to do so with appropriate updates to the program.¹

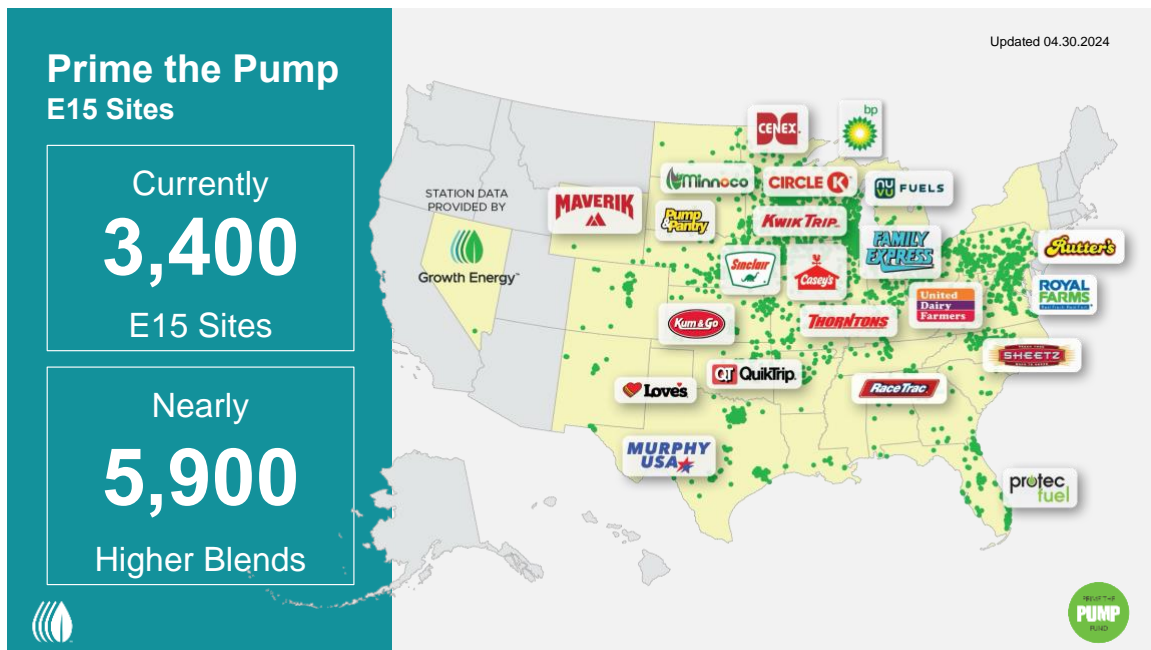
Approval of E15

We applaud the California Air Resources Board's consideration of the role E15 can play in reducing the state's greenhouse gas (GHG) emissions while also providing a cost-savings opportunity for California drivers.² Consumers have embraced E15's reputation as a more environmentally beneficial, more affordable fuel. Since the US EPA approved E15 in 2011, at which time there were zero retailers offering it, its availability rapidly expanded to now 3,400 retail sites in 32 states. Since then, drivers in America have relied on E15 to drive 100 billion miles.³

¹ https://www.transportationenergy.org/wp-content/uploads/2023/07/Decarbonizing-Combustion-Vehicles_FINAL.pdf

² <https://ww2.arb.ca.gov/sites/default/files/2024-04/LCFS%20April%20Workshop%20Slides.pdf>

³ <https://growthenergy.org/2024/01/29/100-billion-miles-e15-growth-energy/>



In contrast, with Nevada, Oregon, the Phoenix metro area, and most recently Montana approving E15 for sale, California remains the only state to have not approved this cost-effective, environmentally beneficial fuel that can be used in nearly all the state's 31 million gasoline-powered vehicles.⁴ If CARB not only approved E15, but replaced E10 with E15, this switch would be responsible for the GHG-reduction equivalent of removing more than 400,000 ICE vehicles from California's roads *without negatively impacting California drivers*.⁵ Neither will it have a negative impact on land use change for bioethanol.

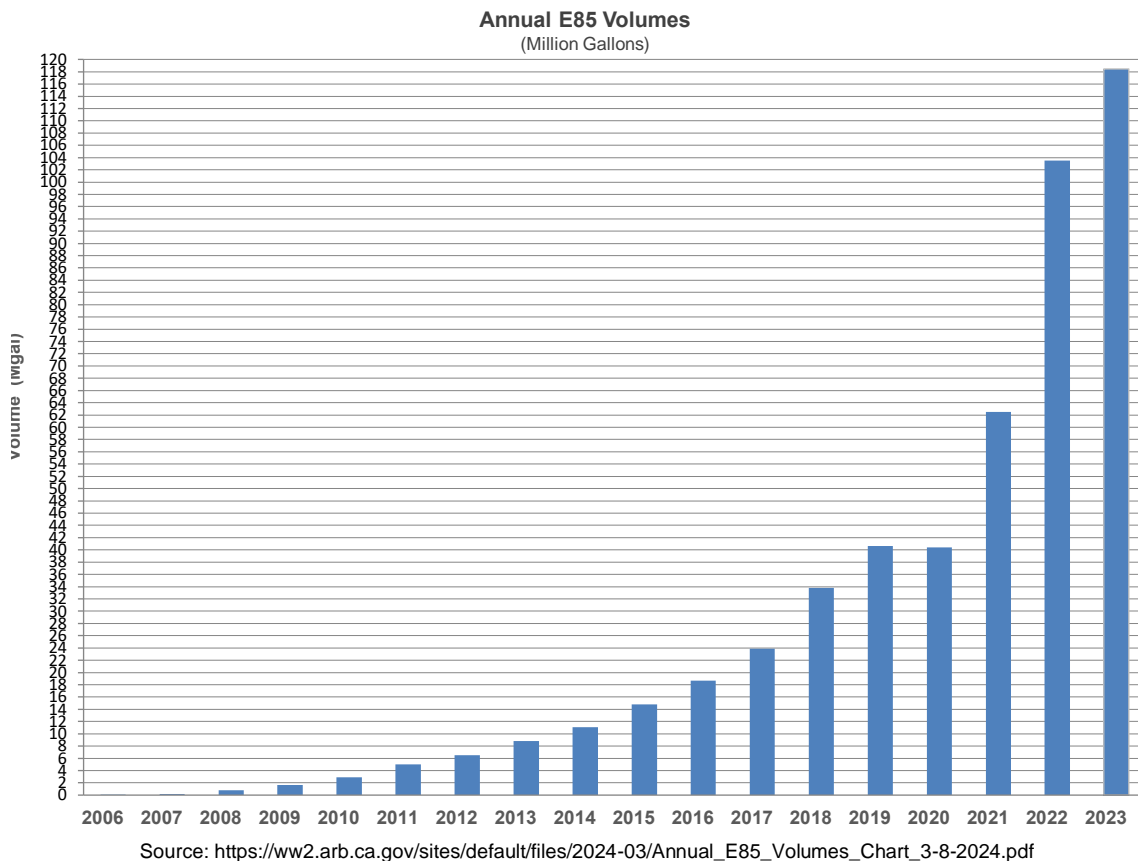
E85, Flex-Fuel Vehicles, and CCUS

Additionally, we appreciate CARB's August 2023 updates to the California Transportation Supply (CATS) Model that recognize the value of carbon capture utilization and sequestration (CCUS) in carbon reduction during bioethanol production. By accounting for CCUS, a process incentivized by the Inflation Reduction Act, the pathway carbon intensity (CI) for E85—approved for use in California—was updated such that it reduces the assumed CI score for bioethanol from 66 gCO₂e/MJ to 35 gCO₂e/MJ.⁶ We appreciate CARB's recognition of the bioethanol industry's efforts to further reduce carbon emissions via CCUS, a process which is incentivized by the Inflation Reduction Act of 2022. This is a welcome update to CATS and a recognition of the positive impact bioethanol has on California's emissions reduction goals.

⁴ <https://ethanolproducer.com/articles/montana-becomes-49th-state-to-approve-the-sale-of-e15>

⁵ <http://www.airimprovement.com/reports/national-e15-analysis-final.pdf>

⁶ https://ww2.arb.ca.gov/sites/default/files/2023-08/CATS%20Technical_1.pdf



Additionally, California’s existing approval of E85 has resulted in significant growth of its use in flex-fuel vehicles (FFVs): more than 118 million gallons have been sold at 375 locations across the state in 2023 alone.⁷ Additionally, the current size of California’s FFV fleet stands at more than 1.3 million vehicles.⁸ The use of E85 will promote even greater reductions in GHG emissions and reductions of air toxics. We would continue to encourage CARB to implement policies that strongly incentivize and as necessary, require the production and use of flex-fuel vehicles, as well as continued investment in infrastructure for expanded access to E85 in the state. In doing so, the Board will be achieving multiple goals: improving air quality and GHG emissions, reducing the state’s dependence on fossil fuels, and providing consumers with an affordable choice to power their vehicles. Again, this can be done without any negative land conversion impact.

Continued Concerns Over Proposed Sustainability Certification

In our comments on the 45-day proposal released on December 19th, 2023, we raised multiple concerns regarding the proposed sustainability certification requirements for crop-based biofuels. Unfortunately, further information provided by CARB in the April 10th, 2024 workshop did little to alleviate our concerns. The proposal’s sustainability

⁷ https://ww2.arb.ca.gov/sites/default/files/2024-03/Annual_E85_Volumes_Chart_3-8-2024.pdf

⁸ <https://afdc.energy.gov/vehicle-registration?year=2022>

certification for crop-based fuels cites concerns regarding land use change (LUC) factors that are unfounded relative to corn starch bioethanol. In fact, the United States is planting grain corn on roughly the same number of acres as was planted in 1900.⁹ At the same time, the per acre yield has increased more than 600%.¹⁰

Additionally, the LUC concern is already addressed in the LCFS's CI modeling. Corn starch bioethanol is given an automatic 19.8 gCO₂e/MJ penalty for indirect land use change (ILUC).¹¹ Adding the proposed sustainability criteria to the current ILUC score amounts to an unfair double penalty for corn starch bioethanol. We also believe the 19.8 gCO₂e/MJ score is outdated and not based on the most up to date research. A review of more recent science indicates a decreasing trend in land use values with the newer data indicating values closer to 4 gCO₂e/MJ.¹²

Further, the details provided in the April 10 workshop will add onerous and costly requirements on biofuel producers and farmers. Yet CARB's economic analysis of the proposal does not discuss the sustainability requirement's financial burden of implementation. Nor will the requirement allow bioethanol producers to use important tools like climate-smart agricultural practices for CI reduction. Some of these practices include precision application of fertilizer, use of low CI fertilizer, no or low-till farming practices, and the use of cover crops.¹³ The use of these practices for measured carbon reduction is not new. Other state agencies are using some of these same practices to reduce the release of soil carbon in the state's natural and working lands.¹⁴

Finally, with respect to the proposed sustainability audit, the proposal's audit requirements address issues that, while important to environmental and social justice, fall outside the scope of the LCFS. The proposed sustainability audit process would require auditors to conduct: "review of management systems", "review of social practices", and an assessment of the "economic sustainability of the applicant." These items have no bearing on GHG reduction. Additionally, many aspects of these audit provisions are addressed by federal programs. The Fair Labor Standards Act has clear employment guidelines specifically for the agriculture industry.¹⁵ Furthermore, if the proposal is adopted, crop-based biofuels would be the only feedstock for which these criteria would be audited.

⁹ https://www.nass.usda.gov/Publications/Todays_Reports/reports/croptr19.pdf,
https://www.nass.usda.gov/Charts_and_Maps/Field_Crops/cornac.php

¹⁰ <https://www.agry.purdue.edu/ext/corn/news/timeless/YieldTrends.html>

¹¹ https://ww3.arb.ca.gov/fuels/lcfs/iluc_assessment/iluc_analysis.pdf

¹² <https://iopscience.iop.org/article/10.1088/1748-9326/abde08/pdf>

¹³ <https://growthenergy.org/policy-priority/climate-smart-agriculture/>

¹⁴ <https://www.gov.ca.gov/2020/10/07/governor-newsom-launches-innovative-strategies-to-use-california-land-to-fight-climate-change-protect-biodiversity-and-boost-climate-resilience/>

¹⁵ <https://www.dol.gov/agencies/whd/agriculture/flsa>

Expand Access to Low-CI Power Sourcing for Biofuels Producers

With respect to Low-CI power sourcing, the proposal fails to recognize the carbon-reduction potential in crediting Low-CI power sourcing in biofuels production. The proposal currently only allows this mechanism for hydrogen. Firstly, the proposal fails the LCFS' fundamental policy goal of carbon intensity reduction in transportation fuels used in California. Allowing bioethanol producers to source *new* contracted low-CI power that is not included in a utility resource plan via a power purchase agreement does not impact electricity demand.

Secondly, biofuels production occurs largely in electricity markets outside of California. This renders the argument against expanding low-CI power sourcing due to purported resource shuffling moot. Additionally, by not expanding this provision to biofuels, it denies the state the opportunity to lead other jurisdictions towards increasing their low-CI power generation capability.

Accelerate the Use of Sustainable Aviation Fuel (SAF)

As producers of one of the most scalable feedstocks for SAF production, we appreciate the Board's attention to development of this key market through its proposal to remove the exemption for intrastate jet fuel. We encourage CARB to continue to work with SAF producers, biofuel feedstock producers, and airlines to continue to seek ways to accelerate use of these important fuels to help decarbonize the aviation sector.

Thank you for the opportunity to provide input on the April 10th, 2024 workshop. The LCFS Program is a critical tool to addressing climate change, and we look forward to working with CARB to ensure the role of biofuels in making California's fuel mix more sustainable and help the state achieve its progressive climate goals through the expanded use of bioethanol.

Sincerely,



Christopher P. Bliley
Senior Vice President of Regulatory Affairs
Growth Energy

May 10, 2024

Via electronic submittal

Chair Liane Randolph and
Members of the Board
California Air Resources Board
1001 I Street
Sacramento, CA 95814
cotb@arb.ca.gov



Re: CBE Comments in Response to the April 10, 2024, Low Carbon Fuel Standard Workshop

Dear Chair Randolph and Members of the Board:

Communities for a Better Environment (“CBE”) writes in opposition to the Proposed 2024 Low Carbon Fuel Standard (“LCFS”) Regulation, which was discussed at the April 10, 2024, LCFS workshop. CBE is an Environmental Justice (“EJ”) organization, representing Wilmington, Richmond, East Oakland, Southeast Los Angeles, and surrounding communities that are heavily impacted by fossil fuel pollution from oil refineries, oil drilling operations, mobile sources, power plants, and many other sources.

CBE submitted comments on February 20, 2024, in response to the LCFS proposal described in the Initial Statement of Reasons.¹ Our comments explained that CARB must make critical changes to the proposal to comply with Assembly Bill 32, which requires CARB to design greenhouse gas emission reduction measures “in a manner that is equitable [and] seeks to minimize costs and maximize the total benefits to California,”² and ensure that these measures “do not disproportionately impact low-income communities”³ or interfere with “efforts to achieve and maintain federal and state ambient air quality standards and to reduce toxic air contaminant emissions.”⁴ Our comments described why a cap on credits for crop-based biofuels would better serve CARB’s statutory mandate by (1) addressing the local harms of biofuel refining and biofuels’ global deforestation and food security risks and (2) opening up opportunities to incentivize truly clean, scalable technologies including electrification.

Building upon our previously submitted comments, this comment addresses issues discussed in the April 10, 2024, LCFS workshop hosted by CARB staff. Specifically, this comment responds to CARB’s reasons for declining to consider a cap on crop-based biofuels, which has severe implications for environmental justice communities living near refineries. This comment explains the following reasons why CARB must reconsider a biofuel cap:

¹ *CBE Comments on the Proposed 2024 Low Carbon Fuel Standard Regulation* (Feb. 20, 2024), https://www.arb.ca.gov/lispub/comm/iframe_bccomdisp.php?listname=lcfs2024&comment_num=6984&virt_num=313.

² CAL. HEALTH & SAFETY CODE § 38562(b)(1).

³ CAL. HEALTH & SAFETY CODE § 38562(b)(2).

⁴ CAL. HEALTH & SAFETY CODE § 38562(b)(4).

- 136.1 • CARB is asking refinery communities to choose between two untenable options: either accept decades of future pollution from biofuels or live with the continued production and pollution of fossil fuels. CARB can choose a different approach, focused on investments in zero-emission technologies, that prioritizes liberating refinery communities from the pollution burden they have held for too long.
- 136.2 • CARB's analysis does not support its conclusion that biofuels will create meaningful public health and safety benefits.
- 136.3 • CARB's argument that a cap on biofuels will cause greater fossil diesel consumption does not account for the benefits of increased investments in zero-emission technologies, which CBE and others have been asking for.
- 136.4 • CARB continues to overcount the emission benefits of biofuels by overlooking the LCFS' interaction with the federal Renewable Fuels Standard.
- 136.5 • The biofuel sustainability guardrails proposed by CARB are unlikely to be effective and are no substitute for a cap to restrain the dangerous oversupply of crop-based biofuels.

136.7 Below, we provide more detailed comments on the flaws in CARB's arguments and analysis in the LCFS proposal and at the April 10 workshop. We request that the Board direct CARB staff to revise the proposal to include a cap on crop-based biofuels.

I. Refinery communities should not be asked to make a sacrificial choice between two polluting fuels.

136.8 In the proposal and at the workshop, CARB has presented refinery communities with two options: either accept biofuels and the pollution they generate in your communities, or live with extended production of fossil diesel and extended fossil pollution.⁵ This is a false choice between two pollution traps. In calling for a cap on biofuels, refinery communities are rejecting this exploitive choice; instead, we are asking CARB to have the vision and ambition to think beyond these two options and direct investments to the zero-emission technologies that will transition us more swiftly away from combustion fuels.

136.9 Refinery communities have been living with the racist impacts of fossil fuel pollution for a century and are deeply, personally aware of the need to phase out fossil fuel consumption. CBE's community members in the Wilmington area of Los Angeles deal with pollution from five oil refineries, a large oilfield, two major ports, nine rail yards, four major freeways, and multiple chemical facilities.⁶ Oil refineries are one of the largest sources of criteria pollution and toxic pollution in this area, where pollution burdens are among the highest in the country. Over 86

⁵ See, e.g., Statement by Rajinder Sahota at April 10, 2024, CARB LCFS Workshop, 3:56:35 on YouTube recording ("Part of the purpose of our presentation is to explain why we think we need alternative drop in fuels so that we're not using diesel fuels...Is it okay to keep using diesel fossil fuels in our ongoing combustion fleet or should we consider and actually follow through with giving a cleaner alternative that does deliver GHG benefits and...NOx and PM benefits? Because that's literally the choice we're facing.").

⁶ Erica Yee & Hannah Getahun, *A hot spot for polluted air: By the numbers*, CALMATTERS (Feb. 1, 2022), <https://calmatters.org/environment/2022/02/california-environmental-justice-by-the-numbers/>.

136.9
cont. percent of Wilmington residents are Latinx.⁷ In Richmond in the Bay Area, CBE community members deal with pollution from the Chevron refinery, which is the largest source of fine particulate matter pollution in the city. As a result, Richmond residents suffer asthma rates higher than 90 – 99% of other California residents.⁸ Richmond’s Black and Latinx residents are exposed to higher particulate matter pollution than its white residents.⁹ Communities like Wilmington and Richmond, who directly experience environmental racism and the impacts of “sacrifice zones,” have long been at the forefront asking for a rapid phaseout of fossil fuel production and consumption.

136.10 Refinery communities are also increasingly being asked to accept the pollution burdens and safety risks from biofuel refinery conversions. To date, three California refineries – Phillips 66 Rodeo, Marathon Martinez, and AltAir Paramount – have been converted to produce biofuels. CBE’s February 20, 2024 comments explain why these biofuel conversions are not a legitimate source of public health improvements in environmental justice communities; rather, they are likely to lengthen the life of polluting infrastructure and create new health and safety dangers.¹⁰ Refinery communities – who often live in areas that are severely out of attainment with federal and state air quality standards – should be among the first communities to benefit from California’s transition away from fossil fuels. But biofuel conversions are breathing new life into refineries and creating a new generation of pollution burdens. Environmental impact analyses for the three already-converted biofuel refineries have shown that these conversions have significant impacts on criteria pollution through direct refinery emissions and associated emissions from truck, rail, and marine transportation of feedstocks and biofuel products.¹¹ Experience has also shown that biofuel conversions pose new risks for residents: the Marathon Martinez refinery has had an alarming increase in major health and safety emergencies since converting, which have resulted in dangerous pollution releases in neighboring communities.¹² These biofuel conversions have shown that biofuel production, especially at the heightened levels that the LCFS supports, is undermining much-needed pollution abatement in refinery communities.

136.11 In asking for a cap on biofuels, we are not asking for increased fossil diesel production in refinery communities. We are asking CARB to place commonsense limits on subsidies for an inherently harmful and unsustainable alternative fuel, and to instead focus LCFS investments in vehicle electrification and zero-emission mass transit options to help transition away from combustion vehicles as rapidly as possible. We understand that this transition will not happen overnight, but we know it can happen faster with the benefits of LCFS investment dollars. A cap on subsidies for crop-based biofuels will not eliminate the use of biofuels during this transition; instead, it will help ensure that the glut of biofuels entering California does not slow down our

⁷ Cameron Luu, *Environmental Racism In Wilmington, Los Angeles* (Nov. 19, 2022), <https://storymaps.arcgis.com/stories/230933c5afe24b468e1f839efe6305dd>.

⁸ CalEnviroScreen 4.0, CAL. OFF. ENV’T HEALTH HAZARD ASSESSMENT, https://experience.arcgis.com/experience/11d2f52282a54cee6184203/page/CalEnviroScreen-4_0/?org=OEH (last visited May 8, 2024).

⁹ Alfredo Angulo, *Taking Stock: Visioning Beyond the Refinery*, University of Berkeley Othering and Belonging Institute (Aug. 31, 2022), <https://belonging.berkeley.edu/taking-stock-visioning-beyond-refinery>.

¹⁰ *CBE Comments*, *supra* note 1, at 4-6.

¹¹ *Id.*

¹² *Id.*

transition away from combustion vehicles by diluting incentives for zero-emission technologies.¹³

136.11
cont.

By capping subsidies for biofuels and prioritizing investments in zero-emission technologies, the LCFS could become a program that prioritizes community health and sustainable climate solutions. This reform would help us move beyond the two unacceptable options that CARB has presented to refinery communities.

II. Because it omits key analysis and facts, CARB's staff analysis does not support a CARB conclusion that biofuels will create meaningful public health and safety benefits.

136.12

CARB's presentation at the April 10 workshop, and the underlying analysis provided in the Initial Statement of Reasons, do not support a conclusion that switching to biofuels will provide significant public health benefits. The presentation only discussed the air pollution impacts of biofuel combustion, which is not a complete discussion of air pollution impacts because it overlooks production and transportation of biofuels. Even looking narrowly at combustion, the presentation did not show meaningful air quality benefits. The presentation focused on particulate matter and NOx emissions factors for vehicle combustion of renewable diesel, biodiesel, and fossil diesel, using results from the 2021 study prepared for CARB, which CBE and others had asked CARB to use.¹⁴ CARB's presentation showed that biofuels reduce emissions in older legacy engines but have no significant beneficial impacts in the modern engines that both the on-road and off-road vehicle sectors are transitioning to. These small emissions reductions at the margins of a highly polluting transportation system are a far cry from the changes we need.

CARB's workshop presentation did not discuss the health impacts of biofuel production, although CBE's previous comments urged CARB to consider that biofuel production does not meaningfully improve public health and safety compared to oil refining. As explained above and in CBE's previous comments, biofuel production at refineries has significant direct emissions and associated truck, rail, and marine transport emissions. In some cases, converting to biofuels can increase pollution sources relative to fossil fuel refining.¹⁵ The existing refinery conversions have also shown that these conversions can lead to increases in serious health and safety emergencies.¹⁶ Instead of claiming generally that biofuels improve air quality, CARB should look carefully at the evidence from existing biofuel refinery conversions in environmental justice communities that are already out of attainment with air quality standards.

¹³ See Colin Murphy & Jin Wook Ro, *Updated Fuel Portfolio Scenario Modeling to Inform 2024 Low Carbon Fuel Standard Rulemaking*, at 8, U.C. Davis Policy Institute for Energy, Environment, and the Economy (2024) (explaining that the supply of inexpensive biofuel credits will diminish fuel producers' incentives to invest in more expensive, but innovative, technologies.).

¹⁴ *Id.* at 10.

¹⁵ For example, the Environmental Impact Report for the Marathon Martinez refinery conversion found that it would have a significant and unavoidable impact on PM2.5 exposure for residents and workers in the area. The Environmental Impact Report for the Phillips 66 Rodeo refinery conversion found that the refinery's increased need for delivery of feedstocks would cause marine and rail traffic to increase substantially compared to when the refinery processed oil. *CBE Comments*, *supra* note 1, at 5.

¹⁶ *Id.* at 6-7.

136.12
cont.

We know that the high volumes of biofuels expected under the LCFS will dilute incentives for investment in electrification and other real climate solutions.¹⁷ Given the minimal public health and climate benefits we can get from biofuels, we cannot afford this distraction from our real goals.

III. CARB's modeling has not provided a reliable prediction of the impacts of a biofuel cap on fossil diesel consumption.

136.13

CARB has argued that placing a cap on crop-based biofuels will lead to higher consumption of fossil diesel, but it has not provided sufficient analysis to evaluate the impacts of capping incentives for biofuels and amplifying credits for electrification and mass transit. In comments on the Initial Statement of Reasons, CBE, along with many experts and other environmental and EJ organizations, asked CARB to cap incentives for crop-based biofuels at 2022 levels and enhance crediting for zero-emission vehicles and zero-emission mass transit.¹⁸ These changes would boost incentives for a quicker transition to zero-emission transportation technologies by increasing direct incentives and by reducing the crowding-out effects of a biofuel supply glut.¹⁹

136.14

CARB's modeling of biofuel cap scenarios, which justified CARB's rejection of the biofuel cap option, does not account for the effects on zero-emission technologies and is therefore an incomplete representation of the biofuel cap option. CARB's modeling, using the California Transportation Supply model, holds vehicle electrification and other electrification pathways as fixed, meaning that changes to electrification incentives within the LCFS will not impact the deployment of alternative transportation technologies.²⁰ It is reasonable to expect that creating greater incentives for electrification will increase deployment of electric vehicles and mass transit, and will thereby reduce the need for combustion vehicles. This in turn will likely reduce demand for combustion fuels, including fossil diesel. To reliably predict the effects of a biofuel cap on consumption of fossil diesel, CARB must evaluate the dynamic effects of increased incentives for zero-emission technologies.

136.15

IV. CARB has not yet addressed the biofuel reshuffling problem, which violates AB 32's additionality requirement and undermines any conclusions regarding biofuels' benefits.

136.16

¹⁷ Colin Murphy, *supra* note 13, at 8 (“Obligated parties will have little incentive to invest in innovative, but riskier, approaches to reducing GHG emissions from transportation fuels until either the supply of inexpensive [renewable diesel] is exhausted, or it has displaced all petroleum diesel...”).

¹⁸ See, e.g., CBE Comments, *supra* note 1; *Earthjustice Comments on the Low Carbon Fuel Standard Staff Report: Initial Statement of Reasons*, at 32-39 (Feb. 20, 2024), https://www.arb.ca.gov/lispub/comm/iframe_bccomdisp.php?listname=lcfs2024&comment_num=7077&virt_num=392.

¹⁹ See Colin Murphy, *supra* note 13, at 9 (“A limited amount of waste-based biofuel may have a role in the long-term fuel portfolio, but excessive deployment of crop-based fuels risks creating stranded assets or crowding out more sustainable solutions.”).

²⁰ *Earthjustice Comments*, *supra* note 18, at 11.

136.16
cont.

CARB's proposal overestimates any emission reductions associated with increasing biofuel consumption because it takes credit for reductions that should be attributed to the federal Renewable Fuel Standard ("RFS"). As CBE's previous comment explained, the federal RFS requires nationwide production of biofuels and allows for overcompliance in one state to compensate for undercompliance in another state.²¹ This encourages biofuel producers to concentrate sales in California to take advantage of our LCFS incentives. As a result, a portion of California's biofuel consumption that CARB attributes to the LCFS would have occurred anyway due to the federal RFS.

136.17

CARB's failure to account for this reshuffling effect is a deviation from past rulemakings and is also inconsistent with CARB's statutory mandate. In the 2018 LCFS rulemaking, CARB conducted an attribution analysis to account for the portion of emissions reductions that should be attributed to the federal RFS. CARB has not yet provided any explanation for why it removed this analysis from the current rulemaking. It is imperative that CARB make this correction, because CARB is required under AB 32 to ensure that any greenhouse gas emissions achieved are "real"²² and are "*in addition to* any greenhouse gas emission reduction otherwise required by law or regulation, and any other greenhouse gas emission reduction that otherwise would occur."²³ By taking credit for emissions reductions that should be credited to the federal RFS, CARB is violating this additionality requirement and providing inflated emission reduction estimates.

V. CARB's proposed sustainability guardrails will not resolve the problems caused by rapidly growing production of biofuels.

136.18

The biofuel sustainability guardrails that CARB discussed at the workshop will not resolve the harmful impacts of the biofuel supply glut and are not a substitute for serious measures to restrict incentives for biofuel oversupply. As CBE explained in previous comments, the sustainability guardrails on the table, including a ban on credits for fuels made from palm oil, and sustainability certifications for crop-based biofuel pathways, do not address the critical problem of consumer substitution leading to indirect land use changes.²⁴ Evidence submitted to CARB by Biofuelwatch also show that existing certification programs have in practice "failed as an instrument for addressing sustainability challenges with land-based commodities."²⁵ These approaches are likely to fail at their own goals, and they will not address the biggest problems with crop-based biofuels. CARB can only rein in the severe and irreversible consequences of overinvesting in biofuels by capping the LCFS incentives for crop-based biofuels.

136.19

²¹ *CBE Comments*, *supra* note 1, at 8-9.

²² CARB must ensure that "[t]he greenhouse gas emission reductions achieved are real, permanent, quantifiable, verifiable, and enforceable." CAL. HEALTH & SAFETY CODE § 38562(d)(1).

²³ Emphasis added. CAL. HEALTH & SAFETY CODE § 38562(d)(2).

²⁴ *CBE Comments*, *supra* note 1, at 12-13.

²⁵ *Biofuelwatch Comments on Notice of Public Hearing to Consider Proposed Low Carbon Fuel Standard Amendments* (Feb. 20, 2024),

https://www.arb.ca.gov/lispub/comm/iframe_bccomdisp.php?listname=lcfs2024&comment_num=7028&virt_num=349.

CBE appreciates the opportunity to comment on the April 10, 2024, LCFS workshop. We urge CARB to reign in subsidies and incentives for crop-based biofuels and instead prioritize investments in zero-emission technologies that will create deeply needed public health benefits in environmental justice communities.

Sincerely,

Amelia Keyes
CBE Attorney & Legal Fellow

May 10, 2024

Rajinder Sahota, Deputy Executive Officer
Low Carbon Fuel Standard Program
California Air Resources Board
1001 I St.
Sacramento, CA 95814

RE: Comments on the April 10, 2024, Public Workshop to Discuss the Low Carbon Fuel Standard

Dear Ms. Sahota,

Pacific Ag Renewables (PAR) appreciates the opportunity to comment on the April 10, 2024, workshop to discuss the Low Carbon Fuel Standard (LCFS). PAR is writing as a member of the American Biogas Council (ABC), the voice of the U.S. biogas industry dedicated to maximizing carbon reduction and economic growth using biogas systems. PAR is one of more than 400 companies in all parts of the biogas supply chain that are leading the way to a better future by maximizing all the positive environmental and economic impacts biogas systems offer when they recycle organic material into clean renewable energy and soil products, thereby reducing dependency on petroleum. Biogas systems protect our air, water, and soil by recycling organic material, like food waste and manure.

Biogas systems are, at their heart, a biological means to capture methane that would otherwise be emitted into the atmosphere for use as a renewable fuel. This process specifically decreases baseline methane emissions by converting methane back into carbon dioxide. As described in the 2022 Scoping Plan Update and other supporting programs, such as SB 1383, methane is a highly potent greenhouse gas with 100-year global warming potential (GWP) nearly 30 times that of carbon dioxide. Moreover, as recognized by CARB and many other experts, reducing methane emissions is fundamental to the state meeting its greenhouse gas (GHG) reduction targets. The benefits of biogas systems are twofold; first by capturing methane at the source, which in turn improves local air and water quality associated with feedstock management, and second by reducing tailpipe emissions, such as particulate matter, when used as a transportation fuel.

During the April 10 workshop, CARB staff presented additional analysis and modeling on the proposed carbon intensity (CI) benchmarks, including the step-down and auto acceleration mechanism (AAM). While the 45-day package calls for a 5% step-down, CARB staff presented two additional scenarios - a 7% step-down in 2025 and a 9% step-down in

PACIFIC AG RENEWABLES

1000 S. Hwy 395, Suite A-506

Hermiston, OR 97838

- 137.1 cont. 2025. ABC appreciates CARB's responsiveness to stakeholders' calls for a more ambitious approach as the ABC believes that the original proposal of 5% does not go far enough, considering the current size of the cumulative credit bank and its continued growth. As noted in our February 16, 2024, comment letter responding to the proposed LCFS amendments, the step-down must be increased to at least 7%, and we strongly urge CARB to consider being even more ambitious and adopting a 9% step-down in 2025. With the rate at which the cumulative credit bank is growing, a strong market correction is needed to ensure that the LCFS continues its success, by attracting investments and production in clean fuels. We further recommend that CARB retain the annual rate of CI reductions proposed in the 45-day package to complement increasing the step down in 2025 to 9%.
- 137.2 This means that with a 9% step down in 2025 the 2030 CI reduction target should be 34%.
- 137.3 Also discussed during the workshop was the AAM, a concept that ABC strongly supports. The AAM is designed to respond to clear overperformance of the program, and to dynamically increase stringency to avoid a repeat of the current circumstances (e.g., excessively large cumulative credit bank, depressed credit values, a pullback in clean fuels investments, and lost opportunities for GHG reductions). Establishing the AAM sends an unambiguous market signal to investors that the program has been further improved with future stability in mind by incorporating rules for predictable corrective actions. As proposed in the 45-day package, the first year that the AAM could impact program stringency is 2028. The ABC believes that waiting four years to see these impacts is too long, and we recommend pulling the date for triggering the AMM forward by one year. The AAM should be based on 2025 data, the same year program amendments are
- 137.4 implemented, with the trigger assessment occurring in May 2026 and the AAM being applied in 2027, providing the correct conditions are met. This approach better ensures that potential emission reductions are not left on the table in the event the program continues to overperform following the Board's adoption of the proposed amendments. Further, overperformance of the program sends a muted signal to fuel producers and investors that the program is not an attractive market opportunity, and as the cumulative credit bank continues to grow, entities can use their banked credits to meet their obligations (i.e., offset their deficits) without increasing their demand for clean transportation fuels in California.
- 137.5 While not discussed in detail during the staff presentation, the ABC would like to reiterate the important role that biomethane plays in the program. The scientifically based design of the LCFS recognizes the benefits of projects that collect biomethane that would otherwise be emitted to the atmosphere making it available for use in transportation. As a result, millions of gallons of petroleum-based diesel fuel have been replaced with clean biomethane over the past several years delivering substantial reductions in greenhouse gas (GHG) emissions as well as other co-benefits (e.g., reductions in emissions of particulate matter). Furthermore, the ABC would like to emphasize the need for CARB to send a clear policy signal that biomethane is a necessary and effective decarbonization strategy in

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137.5
cont.

sectors outside of transportation (e.g. industrial, residential, commercial) if it is CARB's goal to transition biomethane out of the vehicle sector. There are still emission reduction opportunities within the transportation sector that have yet to be fully realized within the program, such as aviation and marine fuels. As referenced in staff's Initial Statement of Reasons (ISOR) there is an expanded role that biofuels can play in off-road, hard to decarbonize sectors as demand for cleaner fuels and zero-emission technologies continues to grow. The ABC urges CARB to go forward with integrating these sectors into the program to ensure emission reduction opportunities are not overlooked and that there are clear market signals that support investments and innovation directed at producing clean fuels for these sectors.

137.6

Lastly, the ABC would like to reiterate the absolute importance of concluding this rulemaking as soon as possible. On top of the delays we have already seen, any further delays will continue to diminish the necessary policy signal the market needs to facilitate and encourage investments in clean fuels. Thus, the ABC strongly urges CARB staff and the Board to finalize this rulemaking by mid-2024.

Thank you for the opportunity to comment on the April 10 workshop. We look forward to continued engagement with CARB staff and the refinements to the proposed amendments.

Sincerely,

Harrison Pettit

Harrison Pettit
Chief Development Officer
Pacific Ag Renewables

✓



May 10, 2024

Submitted electronically at:

<https://ww2.arb.ca.gov/public-comments/low-carbon-fuel-standard-workshop-april-10-2024>

California Air Resources Board
1001 I Street
Sacramento, California 95814

Re: Airlines for America® Comments on April 10, 2024 Low Carbon Fuel Standard Workshop

I. Introduction

Airlines for America® (A4A), the principal trade and service organization of the U.S. airline industry,¹ appreciates the opportunity to provide comments to the California Air Resources Board (CARB) following the public workshop hosted by CARB Staff on April 10, 2024 on the Proposed Low Carbon Fuel Standard (LCFS) Amendments.² These comments reiterate and supplement our statements provided in written comments on the proposed amendments submitted on February 20, 2024. In summary, CARB is federally pre-empted from regulating jet fuel under the LCFS program, but even if implemented the proposal to eliminate the exemption for jet fuel used on intrastate flights would not achieve CARB's stated objective to increase the production, availability, and use of Sustainable Aviation Fuel (SAF), also referred to as Alternative Jet Fuel (AJF) by CARB, in California. A different approach is necessary for CARB and the aviation industry to achieve our mutual objectives for SAF use in California.

138.1 The U.S. airline industry is committed to reducing its climate impact and achieving net zero carbon emissions by 2050. Transitioning to SAF is core to this commitment, and we have pledged to work with governments and other stakeholders to make three billion gallons of SAF available in the United States by 2030. Through this and individual airline targets and goals a clear market signal for affordable SAF has been established. Achieving these goals requires new and additional policy incentives, streamlined permitting processes, and close collaboration among airlines, the fuels industry, manufacturers, environmental organizations and governments, among others.

With respect to SAF, California has established itself as an early leader in attracting investment, production, and use of SAF through the existing LCFS Program, which provides an opt-in credit for SAF that helps reduce the price difference between SAF and conventional jet fuel. We look

¹ A4A's members are: Alaska Airlines, Inc.; American Airlines Group Inc.; Atlas Air, Inc.; Delta Air Lines, Inc.; Federal Express Corporation; Hawaiian Airlines, Inc.; JetBlue Airways Corp.; Southwest Airlines Co.; United Airlines Holdings, Inc.; and United Parcel Service Co. Air Canada, Inc. is an associate member.

² These comments supplement and incorporate A4A's comments on the LCFS submitted on January 7, 2022, August 8, 2022, March 15, 2023, and February 20, 2024. as well as the comments previously submitted during the 2018 LCFS referenced in footnote 10 *infra*.

forward to working with CARB on measures that will rapidly expand availability and deployment of SAF in California.

Aviation accounts for 2.6% of the U.S. greenhouse gas emissions but 5% of U.S. Gross Domestic Product (GDP) and 4.1% of California's GDP, thus having an outsized economic impact relative to its share of emissions. There are more than 380,000 employees of U.S. commercial aviation firms based in California, with an overall economic impact of \$194 billion³. Aviation is critical to driving California's economy and its rank as the fifth largest economy in the world, enabling \$114 billion in annual trade flows and underpinning many of the rest of California's biggest economic drivers such as agriculture, tourism, manufacturing, banking, technology and small business. Ensuring a healthy and vibrant aviation industry is essential to California's future, and leveraging CARB's early leadership on SAF can enable California leadership in the emerging SAF production industry, creating new jobs and economic development opportunities.

II. Discussion

138.1 cont.

With this context, we reiterate our serious concern with the proposal by CARB to regulate jet fuel used for flights within California as an obligated fuel under the LCFS Program. This proposal to obligate jet fuel would be unlikely to result in increased SAF production, availability, or use in California, but would lead to higher jet fuel prices and slow down rather than accelerate efforts to increase SAF production and use in California. The primary impediment to increased SAF production and availability in California and elsewhere remains the higher cost of SAF for producers and buyers relative to conventional jet fuel and renewable diesel.

The relationship between deficit generation and credit generation is unchanged by the CARB proposal. Under the structure of the LCFS program, deficits are created for fuel producers from specific conventional fuels delivered into California as identified and defined by the program. These deficits form a common pool that can be retired with credits from any type of eligible fuel. But there is no requirement for a relationship between the type of fuel that created the deficit and the type of credit that retires that deficit. Because of the relative economic advantages of renewable diesel compared to SAF, fuel producers will continue to prioritize renewable diesel production instead of SAF. As a result, the removal of the exemption for conventional jet fuel is unlikely to materially change the SAF production relative to the status quo. In fact, the deficits created by intrastate jet fuel likely would be retired primarily by renewable diesel and other road transport related credits. Obligating jet fuel will lead to the increased price of jet fuel, diverting resources that might have gone for SAF purchase and use towards renewable diesel production instead, without creating additional SAF production. And because the proposal will not meaningfully increase SAF supply and use, the local air quality benefits attributed to increased SAF use as a result of eliminating the intrastate jet fuel exemption are overstated.

In addition to not being an effective policy tool to increase SAF production, the CARB proposal to regulate jet fuel is pre-empted by federal law, a fact that CARB recognized when it exempted

³ [The Economic Impact of Civil Aviation on the U.S. Economy, State Supplement, US Department of Transportation, November 2020](#)

138.1
cont.

jet fuel from the LCFS in 2018.⁴ It is critically important that uniform federal rules apply to aviation and aviation fuels, under the Supremacy Clause of the U.S. Constitution. The CARB proposal seeks to regulate jet fuel and reduce emissions from aviation through such regulation, both of which are pre-empted under federal law, as described in further detail below. In light of the clear and broad federal authority for regulating jet fuel and aircraft engine emissions, California is pre-empted from regulating jet fuel under the LCFS. This is explained in detail in our comments submitted on February 20, 2024.

III. Comments on Public Workshop and Supplemental Information

CARB Staff hosted a public workshop on April 10, 2024, and posted supplemental information on CARB Staff analysis on the proposed amendments. With regard to jet fuel, CARB Staff restated the objective to “Increase the use of alternative jet fuel in the State”. The supplemental information posted by CARB provides new data on CARB estimates and expectations for how much SAF would be used in California under the proposed regulations. While there is insufficient information provided to deduce the assumptions in how the projected volumes were achieved, the analysis overstates the projected increase in SAF volumes caused by removing the exemption for jet fuel used on intrastate flights.

Table 1. CARB Analysis of projected AJF volumes under BAU and Proposed Amendments Scenarios, in millions of gallons per year⁵

	2022	2023	2024	2025	2026	2027	2028	2029	2030
BAU Scenario	11.6	5.8	5.8	5.3	5.2	3.9	3.2	3.3	3.3
Proposed Amendments Scenario	11.6	5.8	6.1	111.5	144.8	178.1	211.4	244.7	278.0

The CARB analysis projects that in 2025 SAF use in California will grow from approximately 6.1 million gallons in 2024 to 111.5 million gallons in 2025, three years before the jet fuel obligation is proposed to take effect. First, it is highly unlikely that SAF availability and use could increase this dramatically in a single calendar year. And second, this analysis does not support the effectiveness of the proposal to eliminate the exemption for intrastate jet fuel. If anything, the CARB analysis indicates that eliminating the exemption for jet fuel (i.e. creating deficits from jet fuel) used on intrastate flights is not a significant contributor to increasing SAF use in California. To significantly increase SAF production, availability, and use of SAF in California, and to obtain the benefits of increased SAF use spoken of by many stakeholders at the workshop, one must address the economic disadvantages of SAF production relative to Renewable Diesel. The regulatory proposal does not materially change the relative value of RD and SAF to producers and therefore estimated increases in SAF production, availability and use as a result of the proposal to eliminate the intrastate jet fuel exemption are unlikely to occur. Increasing SAF availability and use as envisioned by the CARB analysis requires a different policy intervention.

⁴ CARB stated that “[s]ubjecting aircraft fuels to annual carbon intensity standards would raise federal preemption issues” available at https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2018/lcfs18/isor.pdf?_ga=2.259407882.1202437490.1641231788-253234234.1573227006

⁵ [Supplemental 2023 LCFS ISOR Documentation | California Air Resources Board](#), posted April 10, 2024

138.6

The CARB Staff presentation and comments by staff during the workshop noted that CARB is seeking comments on guardrails for crop-based fuels. We further note that in its recent guidance on the Inflation Reduction Act (IRA) 40B SAF Blenders Tax Credit, that the federal government has recognized the existing CARB LCFS program process as sufficient to meet the value chain sustainability requirements of the U.S. government. We take this as endorsement of the existing CARB approach to ensure the sustainability of fuels used in the LCFS program, relying on independent auditors and modeling developed by Argonne National Labs and as implemented by CARB in the CA-GREET model. We also note in CARB's presentation at the subject workshop, the analysis that demonstrated the increasing stringency of the carbon intensity requirements of the LCFS program provides a limit on fuels with higher carbon intensity. We encourage CARB to continue to rely on the best available facts, data, and scientific understanding available (and demonstrated during the subject workshop), as it considers guardrails for crop-based fuels.

138.1 cont.

Lastly, we also note in the supplemental information provided by CARB for the workshop that only waste oil and virgin oil feedstocks and pathways are included in CARB's analysis for AJF. Our expectation is that a variety of feedstocks and pathways, including ethanol to jet, cellulosic biomass from wastes and residues, and power-to-liquid pathways will reach commercial maturity during the lifetime of the LCFS program. A4A member airlines are making investments and offtake agreements with future SAF producers of these next generation production pathways to help accelerate their availability.

CONCLUSION

138.1 cont.

A4A supports the existing opt-in crediting model under the LCFS, combined with U.S. federal incentives, as an effective approach for increasing SAF production, use and availability in California. With further collaboration and partnership, we see the potential to dramatically increase the production and use of SAF in California and other jurisdictions and are interested in identifying new opportunities to work together. A4A offers its technical and operational expertise to work together with CARB and other stakeholders in better understanding the challenges and opportunities for promoting the availability of SAF to achieve CARB's objectives of a sustainable and workable reduction of carbon emissions in the transportation sector. The proposal to remove the exemption for jet fuel used on flights within California, however, will not be an effective tool for stimulating SAF production and use, and instead would divert resources and attention away from SAF objectives shared by California and the aviation industry. In addition, CARB is federally pre-empted from removing the exemption for jet fuel and obligating conventional jet fuel as a deficit-generating fuel. We urge CARB to reconsider and withdraw the proposal to eliminate the exemption for jet fuel used on flights within California and instead preserve the existing opt-in approach for SAF and partner with the aviation sector and stakeholders across the emerging SAF ecosystem on new policies and approaches to address the underlying challenges which could rapidly increase the availability and use of SAF in California. We encourage further dialog on this point to find a mutually acceptable path forward.

* * *

Thank you for your consideration of our comments. Please do not hesitate to contact us if you have any questions.

California Air Resources Board
May 10, 2024
Page 5

Sincerely,

A handwritten signature in black ink, appearing to read "Kevin Welsh", with a long, sweeping horizontal line extending to the right.

Kevin Welsh
Vice President, Environmental Affairs and Chief Sustainability Officer
kwelsh@airlines.org



May 10, 2024

Ms. Rajinder Sahota
Deputy Executive Officer – Climate Change and Research
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Submitted electronically through CARB Portal

RE: Comments of Diamond Green Diesel, LLC on CARB's Low Carbon Fuel Standard Public Workshop, April 10, 2024

Dear Ms. Sahota:

Diamond Green Diesel, LLC ("DGD"), a joint venture between subsidiaries of Darling Ingredients Inc. and Valero Energy Corporation, submits these comments regarding the Low Carbon Fuel Standard Public Workshop on April 10, 2024. DGD is a leading producer of renewable diesel in the United States, with a total production capacity of approximately 1.2 billion gallons annually. We are also well underway on a project to upgrade approximately half of the new Port Arthur facility's production capacity to produce sustainable aviation fuel ("SAF"). Upon commissioning of this project, currently planned for early 2025, we are poised to become one of the largest SAF producers in the world.

As one of the nation's leading producers of renewable diesel and as a trailblazer in SAF production, we are proud to have played a leading role in helping California achieve the LCFS goal of reducing the carbon intensity of the transportation fuel pool. Our growth owes much to the strong market signals created by the LCFS, and we look forward to helping CARB continue to improve the program so that it can remain the premiere market-based regulatory program supporting innovation in low-carbon fuels. With that goal in mind, we offer the following comments. DGD has previously commented on the proposed amendments to LCFS and hereby incorporates those comments.¹

Sustainability "Guardrails"

- 139.1 DGD reiterates that a cap on biofuels made from so-called "crop-based" feedstocks would be detrimental to the overall program and problematic for producers. Likewise, DGD again requests clarity on the feedstocks that would fall under the definition of "crop-based" and "forestry-based". Despite previously asking for clarification on this point, staff did not address the ambiguity as it exists in the 45-day package language at the most recent workshop. DGD
- 139.2 processes a variety of feedstocks and it is currently unclear how DGD would comply with any additional requirements related to "crop-based" or "forestry-based" feedstocks.

¹ See, Attachment A, Diamond Green Diesel Comments on 2024 Proposed LCFS Amendments, February 19, 2024.
Diamond Green Diesel LLC • One Valero Way • San Antonio, Texas 78249-1616
Post Office Box 696000 • San Antonio, Texas 78269-6000 • Telephone (210) 345-2000



Increasing Stringency of Annual Carbon Intensity Benchmarks

DGD agrees with increasing the carbon intensity benchmarks in the near term through the implementation of a one-time step-down. In fact, DGD believes that the market would support a greater step-down than the proposed 5% step-down. This would serve to not only reinforce ongoing investment, such as that being pursued by DGD, but also send a clear message that CARB is committed to using the LCFS to promote transportation decarbonization.

As the modeling suggests, the 5% option is likely insufficient to trigger rebalancing of the market, so any real credit price relief would be delayed until the first AAM trigger, presumably in 2028. Given the current state of the LCFS market, DGD believes a step-down of 9% would more effectively encourage investment in the near term to meet California's ambitious goals.

Tailpipe Emission Factors

DGD is concerned that CARB's proposal to increase tailpipe emission factors for renewable diesel in order to avoid additional crediting for diesel replacements could have unintended consequences for alternative jet fuel and renewable naphtha. The proposed HEFA Tier 1 Calculator applies the renewable diesel tailpipe emission factor to all HEFA fuels, including alternative jet fuel and renewable naphtha. However, the fossil jet fuel and gasoline baselines have not been increased by the same magnitude as the diesel baseline. Incorrectly applying an increased tailpipe emission factor that is based on an updated ULSD baseline to alternative jet fuel and renewable naphtha would unfairly reduce the credit generation potential of these fuels when compared to their respective benchmarks. DGD recommends that CARB does not apply an increased tailpipe emission factor to alternative jet fuel and renewable naphtha.

DGD also encourages CARB to ensure that all revisions to carbon intensity data, including tailpipe emissions, are based on sound and documented technical justification. If CARB intends to increase the tailpipe emission factor for renewable diesel and biodiesel to reflect the increase to ULSD, it should provide justification that the increased emissions are similarly applicable to the combustion of renewable diesel and biodiesel. It is not a sufficient technical justification that staff is merely attempting to hold constant the carbon intensity delta between diesel replacements and ULSD. To this end, DGD looks forward to reviewing the updated lifecycle models and supporting documentation that reflect CARB's latest proposal, and defers further comments on updated tailpipe emission factors until it has a chance to review these documents.

We greatly appreciate your consideration of our comments. If you have any questions or would like to discuss any of the points discussed in this letter, please do not hesitate to contact us.

Sincerely,

Barbara Dudle
Chairman and President



February 20, 2024

Ms. Rajinder Sahota
Deputy Executive Officer – Climate Change and Research
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Submitted electronically through CARB Portal

RE: Comments of Diamond Green Diesel, LLC on 2024 Proposed Low Carbon Fuel Standard Amendments

Dear Ms. Sahota:

Diamond Green Diesel, LLC (“DGD”), a joint venture between subsidiaries of Darling Ingredients Inc. and Valero Energy Corporation, submits these comments regarding the 2024 proposed Low Carbon Fuel Standard (“LCFS”) amendments. DGD is a leading producer of renewable diesel in the United States, with a total production capacity of approximately 1.2 billion gallons annually. We are also well underway on a project to upgrade approximately half of the new Port Arthur facility’s production capacity to produce sustainable aviation fuel (“SAF”). Upon commissioning of this project, currently planned for early 2025, we are poised to become one of the largest SAF producers in the world.

As one of the nation’s leading producers of renewable diesel and as a trailblazer in SAF production, we are proud to have played a leading role in helping California achieve the LCFS goal of reducing the carbon intensity of the transportation fuel pool. Our growth owes much to the strong market signals created by the LCFS, and we look forward to helping CARB continue to improve the program so that it can remain the premiere market-based regulatory program supporting innovation in low-carbon fuels. With that goal in mind, we offer the following comments.

Feedstock Considerations

DGD appreciates that CARB does not propose to implement a cap on biofuels made from crop-based feedstocks, because doing so would have been impractical to implement, could have created market uncertainty, and may have led to legal challenges. However, DGD has some concerns regarding the proposed specified source feedstock attestation letter requirement because they will increase the annual verification burden for pathway holders without any associated “value add” to the program. If it is the intent of the provision that upstream suppliers be held accountable through the pathway holder, then it is duplicative of the currently effective provisions requiring chain of custody documentation. CARB should consider an approach consistent with the International Sustainability and Carbon Certification (“ISCC”) requirements.¹

¹ International Sustainability and Carbon Certification, *ISCC EU 201 System Basics*, at pp. 25-28, available at: https://www.iscc-system.org/wp-content/uploads/2024/01/ISCC_EU_201_System_Basics_4.1_January2024.pdf (“The collecting point is the first element that must be individually certified. Points of origin can be covered under the certificate of the collecting point but may also receive an individual or group certification.”)



Likewise, DGD requests that CARB provide greater clarity on the definition of “crop-based” and “forestry-based” biofuels. Currently, it is unclear which feedstocks Subsection 94588.9(g)(1) would apply to. DGD reiterates its previous comment that distiller’s corn oil (“DCO”) used to make renewable diesel is inedible and not fit for human consumption.² Additionally, it is produced as a byproduct of the ethanol production process. Because corn is not grown to provide DCO, it should not be considered a “crop-based” biofuel, subject to additional sustainability requirements that are ostensibly designed to inhibit land-use change.

To address these issues, DGD suggests that CARB schedule workshops with the affected parties for any sustainability requirements, as was previously done with the CI stringency and AAM provisions. There are numerous international approaches to supply chain declarations that CARB can study and more seamlessly implement, with appropriate stakeholder feedback. At a minimum, CARB should reconsider the length of time allowed for verification and/or allow for less intensive verifications, as has been done with fuel reporting entities reporting only electricity transactions. The recent announcement to postpone the Board’s consideration of the rule may provide an opportunity to further develop this issue.

Feedstock Emission Factors

a. Feedstock Emission Factor for Tallow Rendering

The emission factor for tallow rendering used in the draft HEFA Tier 1 calculator is almost 2.5x the value in Argonne’s GREET 2022 model (286 gCO₂e/lb oil vs 119 gCO₂e/lb oil). The draft HEFA Tier 1 calculator and CA-GREET 4.0 appear to use the same values for energy consumption in the tallow rendering process as CA-GREET 3.0, which was based on GREET 2016. Since the publication of GREET 2016, Argonne has updated their tallow rendering data and emission factors multiple times based on updated industry data. CARB should update the tallow rendering values in CA-GREET 4.0 to reflect the most current Argonne GREET 2022 model, to ensure consistency with the other feedstocks and processes that CARB has updated in CA-GREET 4.0.

b. Feedstock Emission Factor for UCO Rendering

Similarly, CA-GREET 4.0 uses a UCO rendering emission factor of 87 gCO₂e/lb oil, compared to Argonne GREET 2022’s UCO rendering emission factor of 81 gCO₂e g/lb. CARB should update CA-GREET 4.0 consistently with GREET 2022 to reflect current industry practices for all feedstock and fuel production processes, regardless of technology.

Increasing Stringency of Annual Carbon Intensity Benchmarks

In light of CARB’s recent announcement that the Board hearing on the proposed amendments will be postponed pending staff’s reconsideration of the proposed carbon intensity benchmarks, DGD will reserve specific comments regarding the stepdown and AAM at this time and will look forward to participating in the workshops planned for mid-April. DGD agrees in principle with the near-term step down in order to send a clear message that CARB is committed to using the LCFS to promote transportation decarbonization and to help stabilize the unprecedentedly high credit bank.

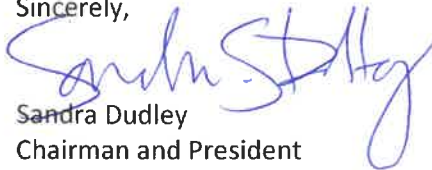
² Comments of Diamond Green Diesel LLC on February 2023 CARB LCFS Revisions Workshop, March 13, 2023.
Diamond Green Diesel LLC • One Valero Way • San Antonio, Texas 78249-1616
Post Office Box 696000 • San Antonio, Texas 78269-6000 • Telephone (210) 345-2000



Additionally, we note that the proposal to extend the program for ZEV infrastructure credits to medium- and heavy-duty ZEVs could potentially work counter to the proposed increased stringency of the targets. Because vehicle manufacturers and fleet owners face regulatory mandates to transition the medium- and heavy-duty vehicle fleets to ZEV technology, incentives already exist for affected parties to provide for infrastructure to support these technologies. Providing additional incentives in the form of LCFS credits may lead to credit price dilution, thus further weakening the credit market and reducing incentives for development of all low-carbon transportation fuels. It is not clear that CARB has modeled both of these phenomena in conjunction, and staff may not have a clear indication of how the market will emerge and continue to drive innovation and investment in low-carbon transportation fuels.

We greatly appreciate your consideration of our comments. If you have any questions or would like to discuss any of the points discussed in this letter, please do not hesitate to contact us.

Sincerely,



Sandra Dudley
Chairman and President

May 10, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95814

Via electronic submission

Re: Comments on April 10 Low Carbon Fuel Standard Workshop

The Missouri Soybean Association (MSA) appreciates the opportunity to provide comments in response to the April 10 Low Carbon Fuel Standard (LCFS) workshop. MSA is an affiliate of the American Soybean Association (ASA) and welcomes the chance to engage with the California Air Resources Board (CARB) regarding its most recent workshop.

MSA represents Missouri soybean farmers on domestic and international policy issues important to the soybean industry. After more than 50 years, the Association continues to be the voice for soybean farmers and all who are part of the soy value chain. It means joining a team that is making a difference for agriculture in Missouri and the U.S.

U.S. soybean growers have long been committed to producing the world's food, feed, fuel, and thousands of bioproducts in a sustainable and climate-smart way.

As CARB revises and refines provisions in the Initial Statement of Reasons (ISOR) package, MSA is pleased to expand ASA's comments provided during the April 10 workshop. Of highest importance is ensuring that sustainability guardrails are workable for the soybean industry. Additionally, MSA requests that CARB update soybean land use change modeling that uses 20-year-old data and does not reflect current growing practices. Given the recent federal tax guidance released in April on sustainable aviation fuel, there are also additional opportunities to develop LCFS policies that complement work being done at the federal level rather than create duplicative frameworks that create additional burdens on the biofuels value chain.

Positive Workshop Outcomes

MSA appreciates much of the work that CARB staff highlighted in the April 10 workshop. We agree that the robust public process that CARB has championed throughout the LCFS update work has offered significant opportunities for engagement. The workshop highlighted that liquid fuels will continue to be needed in the transportation sector in California for at least the next decade, and MSA believes the role of soy-based biofuels to lower emissions in today's remaining liquid fuel market is vitally important to help mitigate the impacts of climate change. CARB also noted that the Environmental Justice Advisory Committee's proposed agricultural feedstock cap would result in an increase in petroleum diesel usage. We appreciate that analysis done by CARB aligns with ASA conclusions in terms of the negative and perverse impacts of an agricultural feedstock cap.

Looking specifically at soybean oil prices and demand, MSA appreciates that CARB explored soybean oil price volatility in recent years and determined that it was not the result of domestic biofuels policy, but instead the result of several factors, including the war in Ukraine, weather, and other market disruptions. Further, CARB dispelled arguments that use of soybean oil for biofuels was impacting food prices and called this argument a "misleading representation" of the interaction between food and fuel.

MSA thanks CARB for their work on this and offers ASA and our state association as resources for additional data related to this in the future.

140.6 MSA also appreciates CARB's additional attention on waste feedstock integrity. Imports of these feedstocks, especially used cooking oil, have exploded in the past couple of years due to incentives in California's LCFS. During much of this period, used cooking oil (UCO) was worth more than virgin palm oil. The increase in U.S. imports of UCO occurred after the EU started investigating fraud allegations as much of the trade was rerouted to the North American market. MSA encourages CARB to verify the integrity of imported UCO used in the LCFS.

Sustainability Guardrails: Exploring Additional Options

140.7 While CARB had mentioned sustainability guardrails broadly before, this workshop was the first time that staff detailed potential sustainability measures required for agricultural feedstocks. MSA understands that CARB must balance liquid fuel market demands with environmental sustainability goals in California. However, we believe that it is important to work with the biofuels value chain to develop an outcome that is economically and logistically viable for the industry.

140.8 Unfortunately, the information provided in the ISOR and presented in the April 10 workshop offer limited explanation as to why sustainability guardrails are required for agricultural feedstocks. CARB workshop slides state despite increasing domestic virgin oil supplies and uncertainty about increases in virgin oil biofuel consumption in California, "Guardrails [are] still warranted to reduce risks of potential impacts from increased demand of virgin oils in CA LCFS and inform other clean fuels program design." It is not clear what risks remain that must be addressed. Total land use change risk is captured by the LUC score penalty from the GTAP model¹. From an aggregate standpoint, whether biofuels were produced from a U.S. acre in production in 2007 or thereafter is largely irrelevant for carbon intensity. The total change in the system is the important component. Simply shifting eligibility among domestic acreage only adds costs without a program benefit.

140.9 It is also not clear what is meant by informing other clean fuels program design. Many other programs already account for land use change. We also are uncertain what role California plays in the regulatory affairs of other jurisdictions, like Missouri. The total land use change in the U.S. for crops cannot exceed late 2007 levels under the federal Renewable Fuel Standard. This provision ensures that total crop acreage in the U.S. cannot expand for biofuels. Furthermore, CARB's Global Trade Analysis Project model for biofuels (GTAP-BIO) assumed 812 million gallons of soy-based biofuels are consumed in state whereas California only consumed 378 million gallons in 2023. Last of all, announcements for crush plant expansion in the U.S. total about a 30% increase in domestic capacity. Even if all of these plants were built, that translates to about 15% of the U.S. soybean crop, and the country currently exports 40 to 50% of the soybean crop.

140.11 Without clearly demonstrated objectives, it remains difficult to devise suggestions for a program. Furthermore, other biofuels feedstocks consumed in California are generally not held to the same standard where they must prove they did not engage in a behavior that is already accounted for in the life cycle analysis. This in practice drives up the costs of agricultural feedstocks compared to other feedstocks and fuels, such as petroleum. In other words, it discourages the use of renewable diesel

¹ https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/iluc_assessment/iluc_analysis.pdf

- 140.12 relative to diesel, which is detrimental to overall GHG emissions. If CARB insists that sustainability criteria for agriculture must be met, it should look to programs already developed through farmer input and provide improved scoring for feedstocks that employ sustainability practices to minimize the changes in comparative costs. Based on the criteria outlined in the workshop and proposed third-party audit scheme, MSA finds the proposal problematic.
- 140.13

Aligning Sustainability Guardrails with Federal Initiatives

- 140.14 The recent tax guidance² for sustainable aviation fuel (40B) released by the Internal Revenue Service and Department of Treasury offers insights as to how CARB could offer improved scoring for feedstocks grown employing CSA. The 40B tax credit uses a new GREET methodology (40BSAF-GREET 2024), which shows soybeans offer a 55% emissions reduction, and can improve an additional 5% using limited CSA. The U.S. Department of Agriculture's Climate Smart Agriculture Pilot Program is currently collecting a myriad of outcomes-based data on agricultural improvements from farmers using CSA. Rather than penalizing agricultural feedstocks through an onerous audit system, CARB should consider providing additional emissions reductions to feedstocks employing CSA.

In January, a new Clean Fuel Production Credit (45Z) will go into effect, which we hope will build on the cover crops and no till practices included in 40B. Conservation tillage, crop rotations, sustainable inputs, precision agriculture, and other practices all help produce a more sustainable soybean. Missouri's widespread adoption of CSA practices improves the state's soybean production. CSAs ensure sustainable soybeans while supporting the local economy and fostering environmental stewardship. This approach promotes food security and preserves family farms, benefitting both producers and consumers alike.

Acknowledging the work being done throughout U.S. soybean fields will ensure that CARB does not restrict sustainable feedstocks from its fuel portfolio.

A Critical Need for Stakeholder Engagement

- 140.15 Any agricultural sustainability criteria that CARB establishes will have significant impacts on how the soy industry and biofuels value chain operates. Hosting one workshop that included sustainability concepts did not provide enough of an opportunity for stakeholder engagement on this topic. MSA supports ASA's request that CARB convene a working group of industry stakeholders before finalizing sustainability criteria to ensure that the logistical limitations and financial impacts that could result from this policy are properly considered.

We encourage CARB to convene a working group that includes agricultural feedstock providers, feedstock processors, and biofuels producers to help develop any sustainability provisions that they would be required to implement. This working group should endeavor to flesh out workable sustainability guardrail provisions that CARB can implement by the second quarter of 2025. This would ensure that CARB develop a solution that does not unintentionally limit sustainable lipid-based feedstocks through onerous reporting requirements, while allowing CARB to continue to focus on implementation of the rest of the LCFS update by the end of 2024.

Updating Modeling for Soy Oil Feedstocks

² Department of Treasury and Internal Revenue Service. Notice 2024-37.

140.16

MSA is also concerned that without a comprehensive update to the GTAP-BIO that CARB utilizes and that relies on 20-year-old data, soy-based feedstocks will be phased out of the LCFS, even though current data indicates a much lower carbon intensity (CI) score. On the one hand, CARB is recommending stringent sustainability guardrails for U.S. soy, but on the other hand is still on track to phase-out soy-based biofuels from credit generation by approximately 2035 or sooner.

CARB is updating all major models for lifecycle emissions calculations except for GTAP-BIO in this rulemaking. As mentioned above, the soy industry has made vast improvements in sustainability and efficiency over the past two decades, with even greater improvement goals ahead. At the same time, CARB continues to rely on a 2014 model that uses data from 2004. The ILUC score accounts for half or more of the CI score for soy-based biofuels. CARB's current modeling assigns soy biomass-based diesel with an ILUC impact of 29.1g CO₂e/MJ whereas updated results from the model used to calculate ILUC scores indicate a value of between 9 and 10 gCO₂e/MJ for soybeans³. The recently released 40BSAF-GREET 2024 model has an ILUC score of 12.2 for soy-based sustainable aviation fuel in federal programs. The benefits of the LCFS can only be achieved if CI values are accurately captured. If land use change concerns are large enough to justify sustainability guardrails, then the modeling should also be updated to reflect current land use change data. MSA urges CARB to update its GTAP model to align with other modeling changes being made.

Conclusion

140.17

MSA is encouraged by the continued successes of programs that support the development of cleaner, low-carbon fuels. California's LCFS has in turn supported rural economies that support the soy value chain. We appreciate the work that CARB has done to update and improve the LCFS. However, it is critical that CARB finalizes updates in a way that does not arbitrarily exclude agricultural feedstocks through onerous sustainability guardrails developed without the input of growers.

MSA is eager to continue working with CARB to support the role of agriculture in diversifying the fuel supply and supporting cleaner fuel options in California and beyond. On behalf of Missouri soybean farmers, we appreciate the opportunity to comment and look forward to collaborating with CARB and other relevant stakeholders on implementation of policies that expand the use of soy-based biofuels and market opportunities for soybean farmers.

Sincerely,

Renee Fordyce

Missouri Soybean Association, President

³ Taheripour, F., Karmai, O., and Sajedinia, E. (2023). *Biodiesel Induced Land Use Changes: An Assessment Using GTAP-BIO 2014 Data Base*. Purdue University



May 10, 2024

Rajinder Sahota
California Air Resources Board
1001 I Street Sacramento, CA 95812

Dear Ms. Sahota,

On behalf of the undersigned organizations and companies, we are pleased to submit the following comments for consideration as the California Air Resources Board (CARB) develops updates to the Low Carbon Fuel Standard (LCFS). California's LCFS has been one of the strongest carbon markets in the world, driving significant private investment in achieving the carbon intensity (CI) target. The strength of this market signal was working; however, changes must be made to buttress credit pricing to drive investments necessary to achieve California's 2045 carbon neutrality goal.

We would like to express our gratitude for the diligent efforts undertaken to shape the LCFS to address the role of hydrogen. This supports the vision in the Scoping Plan and is crucial to recognize the comprehensive strides made in addressing the essential components of this transformative pathway for achieving carbon neutrality. While acknowledging the inclusion of significant policy components, we must underscore the importance of nuanced adjustments to ensure the success of hydrogen – a success that is also vital for achieving the standards set forth in Advanced Clean Fleets (ACF), Advanced Clean Trucks (ACT), Innovative Clean Transit (ICT), and Advanced Clean Cars 2 (ACC2) regulations. Our comments are largely focused on very specific intricacies that improve the operability of the initial proposal and avoid disadvantaging hydrogen to other low-carbon fuels.

Heavy-Duty Hydrogen Refueling Infrastructure Credits

141.1

Hydrogen refueling station (HRS) developers assisted CARB in the development of a heavy-duty (HD) capacity credit program that could be built into the Low Carbon Fuel Standard (LCFS). The program, modeled after the light-duty (LD) HRI program, included a capacity cap of 6,000 kg/day with a 50% discount applied to unused capacity. The concept was developed using the current LCFS compliance curve and agreed upon by both CARB and HRS developers as adequate to promote HD HRS development. It has now been included in the proposed LCFS amendments, which industry greatly appreciates.

141.2

In addition to the HD HRI program, CARB's proposed amendments include a step down in the compliance curve, a steeper slope for the compliance curve, taking the curve out to 2045 and an automatic adjustment mechanism (AAM) to help the program self-correct for surplus credit inventory as defined. The amendments to the compliance curve when modeled in a 10-year HRI program window result in a significant reduction of HD HRI credits generated than what was originally contemplated. CHC's estimate, using a zero-throughput assumption (baseline), results in a 19-23% reduction in HRI

141.2
cont.

credits generated over the 10-year term under a 7% stepdown and 25% reduction target by 2030 scenario. A larger stepdown and steeper slope will result in even more lost credits. Regardless of the LCFS credit price, this is a significant reduction in the number of credits for developers.

Every HRS developer uses different assumptions for station capital costs, operating costs, projected throughput and LCFS credit price. Using a zero-throughput scenario, independent of any of these variables, a 23% reduction is significant. While each developer will have their own models that predict the impact on returns, all will show this reduction in credit generation is significant and will negatively affect investment decisions.

While the amendments to the LCFS are aimed at boosting the credit price, it may take years for this to happen if it happens at all. HD HRI developers are wary of LCFS price projections and will not model investments on aggressive LCFS pricing. Rather, they will take a conservative view on the forward price on which to base investment decisions.

Our recommendation is the applied HRI discount be adjusted to 39%, from the proposed 50% to account for this impact.

Assumptions - Single HRS											
3,000 kg/d HRI Credit											
Zero TP											
10 year term ('26 - '35)											
Annual HRI Credits (tonnes of CO2e)											
	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Sum
Current Diesel Compliance Std.	19,185	18,903	18,672	18,339	18,056	17,774	17,540	17,210	16,928	16,646	179,252
7% Stepdown, 25% by 2030	17,598	17,097	16,641	16,095	15,594	14,592	13,627	12,587	11,583	10,581	145,994
Impact	(1,587)	(1,806)	(2,030)	(2,244)	(2,463)	(3,183)	(3,913)	(4,623)	(5,345)	(6,065)	(33,258) -23%
7% Stepdown, 25% by 2030											
61% Capacity or 39% Discount	21,470	20,858	20,302	19,636	19,024	17,802	16,625	15,357	14,131	12,909	178,113
7% Stepdown, 25% by 2030											
50%	17,598	17,097	16,641	16,095	15,594	14,592	13,627	12,587	11,583	10,581	145,994
60%	21,118	20,516	19,970	19,314	18,713	17,510	16,352	15,105	13,900	12,697	175,193
62%	21,822	21,200	20,635	19,958	19,336	18,094	16,897	15,608	14,363	13,120	181,033
70%	24,637	23,936	23,298	22,533	21,831	20,428	19,077	17,622	16,216	14,813	204,392
75%	26,397	25,645	24,962	24,142	23,391	21,887	20,440	18,881	17,374	15,871	218,992

Light-Duty Hydrogen Refueling Infrastructure Credits

The (LD) HRI program as originally implemented was working as intended with station providers opening up to eight stations in a single year (2021) when credit prices were healthy. The LCFS program had effectively dealt with the “chicken-or-the-egg” challenge by incentivizing private investment and building stations of adequate size to satisfy drivers’ needs. The effective halt to building more stations is a direct result of credit prices falling to unprecedented low levels.

141.3

We are confident that CARB will implement policies to bring the credit prices back to sustainable levels, however, the proposed 600 kg/d capacity cap will disincentivize the building of stations to serve the existing LD population as well as the larger format medium-duty pickup trucks and work trucks being announced and demonstrated by multiple automotive manufacturers. These trucks will fuel at the neighborhood fueling stations, as they do now, and under sizing HRS will exacerbate vehicle queueing, congestion, delivery challenges and economic hurdles experienced with the first generation, low-capacity, and single dispenser HRS. California's regulatory requirements and learned experience with low capacity HRS further necessitates and informs that we should not incentivize stations under 1,200 kg/day of capacity. Therefore, we urge the LD HRI to be maintained in its current, successful form.

Equitable Policy Design

141.4

Absent direct access or specific hydrogen tariff's, grid-tied hydrogen production is significantly disadvantaged to charging and other fuels by the proposed requirements in the LCFS draft. Hydrogen production with the appropriate policy signals can help manage and mitigate issues that result from a grid with a high concentration on variable renewable electricity while also reducing the ratepayer impacts that are associated with managing these variable renewable resources by allowing deeper penetration of renewable energy throughout the economy and the recovery of costs from curtailment or over-procurement.

Under the current LCFS regulation at §95488.8(i)(1), electrolytic hydrogen producers that produce hydrogen fuel for direct use as a transportation fuel or hydrogen used to produce a transportation fuel can source low carbon intensity electricity through the use of book-and-claim accounting by acquiring renewable energy certificates (RECs) from electricity produced within the same balancing authority or consistent with CPUC §399.16(b)(1) within the most recent three calendar quarters.

Under CARB's proposed revisions to the LCFS program at §95488.8(i)(1)(C), it will be considerably more difficult for hydrogen producers to source low carbon intensity electricity than under the current LCFS regulation. Only the deliverability requirement would remain the same as in the current regulation. CARB is proposing to impose the following limitations and requirements on the use of low carbon intensity electricity in hydrogen production:

- Contracting method- REC sourcing would no longer be sufficient. Hydrogen producers would need to be the first contracted entity for procuring the electricity via power purchase agreement (PPA).
- Additionality- Existing low-CI power sources would no longer be acceptable, only new or expanded production on or after January 1, 2022, or within three years of the start of the hydrogen production facility whichever is later would be acceptable.
- Temporal period- the temporal period would be narrowed to one calendar quarter.

We understand that these proposed amendments are intended to address concerns of consequential emissions, and some of these might be necessary outside of California, however the culmination of energy and climate policies in California provide sufficient and comprehensive guardrails to avoid these concerns.

California's policies have long contemplated the impacts of shifting demand from fossil fuels to decarbonized energy resources. Protections have been well established in statute and across regulatory programs to prevent new electric loads from increasing emissions in California. The combination and interaction of the Renewable Portfolio Standard (RPS) and Cap-and-Trade program will prevent emissions from occurring, even without hourly time matching and strict additionality. The hydrogen facilities and the utilities that will serve them are not somehow exempt from California's climate policies so importing unspecified power to serve electrolyzer loads is not legal or possible.

The California Cap-and-Trade is an enforceable binding and declining cap on greenhouse gas emissions. The RPS is an enforceable binding compliance obligation. Neither RPS or Cap-and-Trade obligations change if load is shifted from fossil fuel to electricity or e-fuels like electrolytic hydrogen production. RPS annual compliance obligations are assumed into Electric Distribution Utility (EDU) load forecasts that inform Cap-and-Trade allocations. EDUs in their Integrated Resource Plans (IRP) balance their obligations with RPS with their obligations to reduce emissions under cap-and-trade. This balance in renewable procurement with declining carbon emissions and the cost of carbon inform modeling that dictates what generation resources are procured.¹ The key concern is that clean capacity expansion on the grid is not keeping pace with demand. However, the requirement to update load forecast and continually plan for that forecast through increasing the capacity expansion order under the IRP directly mitigates these concerns in California.

California's Electric Planning – *A Complex Ecosystem*

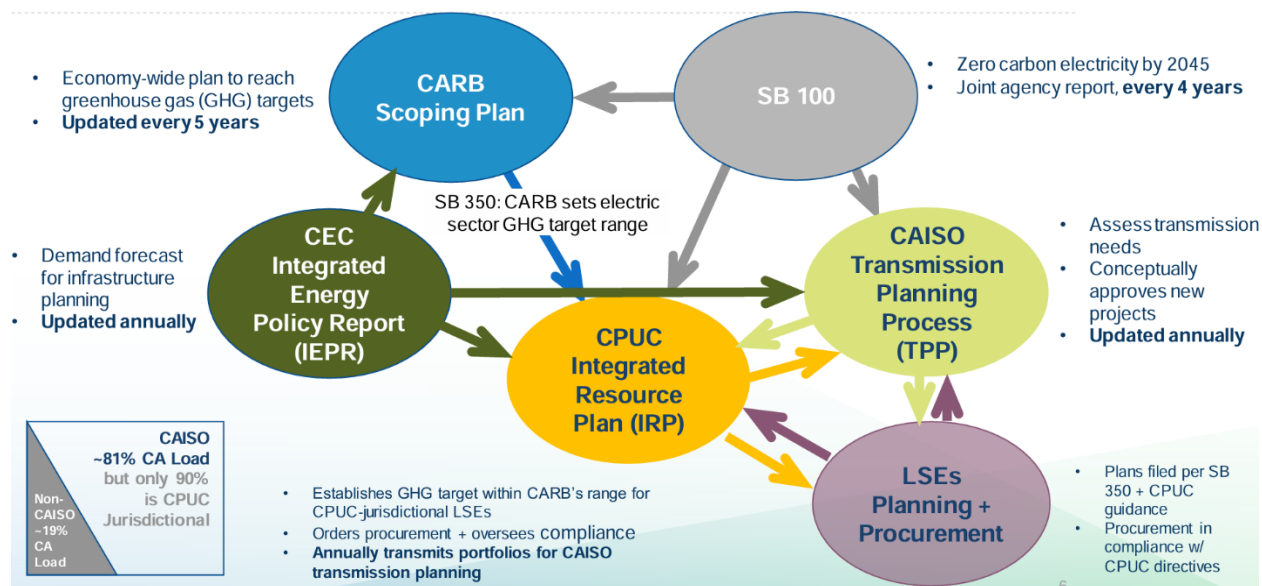


Figure 1: Commissioner Gunda's Presentation to Assembly Energy and Utilities Committee on February 20, 2024, describing the layered policy interactions that help ensure our renewable energy and climate goals are achieved.

¹ Pub. Util. Code section 454.52 and 9621

In their February 12, 2024, letter to Governor Newsom, a coalition of environmental organizations including California Environmental Voters, NRDC, EDF and the Sierra Club, among others, write “If you redirect existing renewable energy sources from the current users of that power, those households and businesses will still need electricity and in California that means more gas plants will need to be fired up”. The letter goes on to say, “Allowing hydrogen producers to add substantial new electricity demand on the grid and cannibalize existing clean energy to meet that demand will drive increased fossil fuel generation to fill the gap and significantly compromise the achievement of a zero-emission grid by 2045.”

These letters describe resources shuffling, which is expressly prohibited in California law. Simply put California does not allow redirection of existing renewable energy sources that result in increasing carbon emissions within the west as we transition to a zero-carbon electric system. Section 454.53(a) of the Public Utilities Code states,

“It is the policy of the state that eligible renewable energy resources and zero-carbon resources supply 100 percent of all retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all state agencies by December 31, 2045. The achievement of this policy for California shall not increase carbon emissions elsewhere in the western grid and shall not allow resource shuffling. The commission and Energy Commission, in consultation with the State Air Resources Board, shall take steps to ensure that a transition to a zero-carbon electric system for the State of California does not cause or contribute to greenhouse gas emissions increases elsewhere in the western grid, and is undertaken in a manner consistent with clause 3 of Section 8 of Article I of the United States Constitution. The commission, the Energy Commission, the State Air Resources Board, and all other state agencies shall incorporate this policy into all relevant planning.”

We agree hydrogen production will increase demand on the energy grid. Building electrification for commercial and residential properties, ports infrastructure, electric vehicles and proposed legislation like AB 841 and AB 2083 (Berman, 2023 and 2024) call for the electrification of industrial processes – none have prompted a discussion around renewable power sufficiency, displacement, or fears around resource shuffling, etc. Energy demand is factored into the utility Integrated Resource Plans, so why is hydrogen production being held to a different standard or being pushed outside the grid? Particularly as hydrogen seeks to replace the energy demand of fossil fuels and fossil fuel production. **As it relates to the concerns, we suggest a more comprehensive and non-discriminatory policy actions:**

- **Develop a comprehensive strategy (utilizing the Scoping Plan, IERP, and IRP) that contemplates the benefits of load management, reliability, resiliency, mitigation of negative climate externalities (specifically biomass and biogas) and systematic integration across time and geography to inform a hydrogen production strategy that allows it to compete and displace gasoline, diesel, and natural gas. Fundamental to this strategy, California should contemplate either:**
 - **Exemptions from the direct access cap for hydrogen production. This would allow facilities to sign PPAs and more readily control their cost structure.**
 - **Develop an electric tariff that allows hydrogen to be cost-effectively produced and contemplates how hydrogen production can load follow.**

141.5
cont.

- Appropriate rate design will leverage abundant renewable electricity and reduce the approximately 2.5 TWh of curtailed wind and solar while recovering ratepayer costs that would otherwise be wasted.
- Get renewable energy projects on-line sooner. On average California is building 2GW of new renewable projects per year, at our peak 2.7GW, yet we need to build 7GW annually to meet our 2045 goals.
 - Permitting, interconnection, transmission are all challenges.
- Implement policies that support the transition of existing gas infrastructure to hydrogen.
 - The ability to leverage existing thermal electric generation facilities to provide clean firm dispatchable power will help achieve our RPS and SB 100 goals, as well as better match renewable resources to demand, helping to alleviate transmission constraint.
- Support the adoption of the Joint Utilities Blending Application to evaluate the feasibility and safety of hydrogen blending in existing gas pipelines as a near term strategy to facilitate lower cost transport and in support of establishing a hydrogen injection standard, and ultimately transition of the pipeline system to 100% hydrogen.
- Support the passage of legislation enabling a renewable gas standard in California's pipelines and ultimately transition of the pipeline system to 100% hydrogen.

Policies that set unnecessary, differential, and higher standards on hydrogen production will hamper and slow progress toward deep economy wide decarbonization as clean and renewable hydrogen is key to decarbonizing our massive use of molecular fossil fuels today. Molecular fuels are also key to ensuring reliability, fuel diversity and resiliency for our power sector in addition to our transportation sector - as such clean and renewable hydrogen is a necessary component of our clean energy portfolio going forward and will serve as a key enabler of electrification. If we do not have a way to decarbonize molecular energy, the ratepayer impacts that are currently coming to the forefront will only be exacerbated and California will ultimately fail to achieve our climate change goals.

We urge CARB to strike the proposed changes to hydrogen production that further burden the development of this clean and renewable energy carrier.

Conclusion

We appreciate CARB staff's work on the development of the proposed rule and their commitment to improving the LCFS. Successful adoption of battery and fuel cell electric vehicle technologies requires changes in LCFS to reinforce market pricing, parity in policy, and encourage deployment of fueling and charging infrastructure for zero-emission fleets. The undersigned associations and non-profits will continue to support the development of vehicles, infrastructure, low-carbon, zero-carbon, and renewable hydrogen needed to build this market and reduce emissions. We look forward to continuing to work with CARB staff on the necessary details to finalize this rulemaking proceeding.

Thank you,

Teresa Cooke
Executive Director
California Hydrogen Coalition

Katrina Fritz
President and CEO
California Hydrogen Business Council

Janice Lin
Founder and President
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cc: Matt Botill, Division Chief
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Analyzing Future Low Carbon Fuel Targets in California



May 2024

*Response to LCFS Public Workshop
April 10, 2024*

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Table of Contents

Executive Summary.....	1
1 Introduction	4
ICF Commentary on the CATS model.....	5
2 ICF Analysis of Information Presented at April Workshop	6
Incorrect Application of CI Changes to Biomass-Based Diesel	6
2025 CI Step Down.....	7
Automatic Acceleration Mechanism	9
Appendix	16
Background on ICF modeling	16
Stakeholder Outreach	17

Executive Summary

The California Air Resources Board staff released the Staff Report: Initial Statement of Reasons outlining many proposed amendments to the Low Carbon Fuel Standard program in December 2023. The Staff Report identified three key areas of change with respect to carbon intensity targets: 1) increased stringency by 2030 (from 20% to 30% carbon intensity reduction), 2) a step down of 5% in the carbon intensity reduction required in 2025 (yielding an 18.75% carbon intensity reduction requirement compared to the 13.75% reduction scheduled), and 3) the introduction of an Automatic Acceleration Mechanism. California Air Resources Board staff provided additional documentation during a Low Carbon Fuel Standard Public Workshop on April 10, 2024.

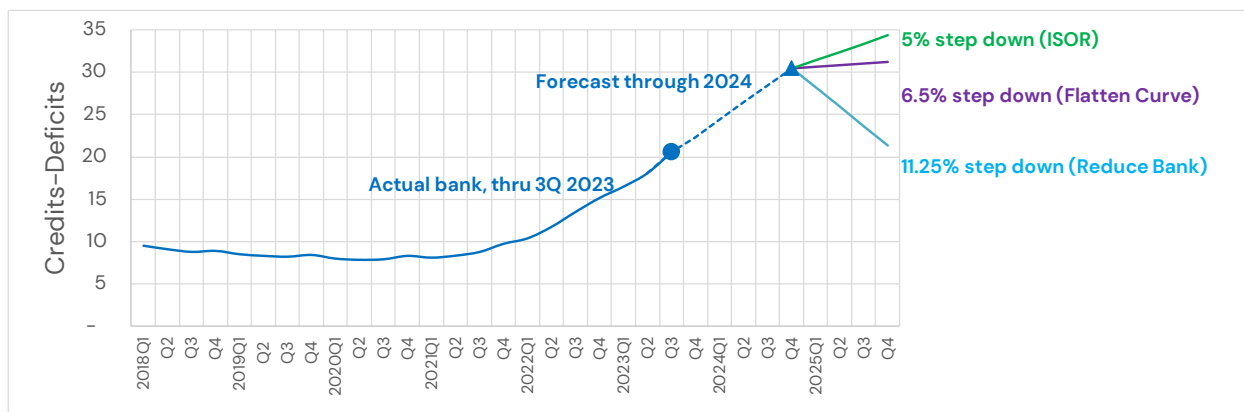
142.1 ICF previously reported that in an Accelerated Decarbonization *Central Case* a carbon intensity reduction target of 41–44% for 2030 is achievable for California's Low Carbon Fuel Standard program. ICF reached this conclusion based on expected fuel volumes and carbon intensity reductions for a wide array of low carbon fuel pathways. The work presented here, however, was prepared in direct response to the Staff Report, accompanying documentation published in December 2023, and new information made available during the Low Carbon Fuel Standard Public Workshop in April 2024. ICF's updated commentary focuses on a) California Air Resources Board staff's incorrect application of carbon intensity changes to biomass-based diesel fuels, b) the carbon intensity step down in 2025, and c) the Automatic Acceleration Mechanism.

The carbon intensity for biomass-based diesel has been incorrectly adjusted by California Air Resources Board staff in the CATS modeling.

142.2 California Air Resources Board staff published data indicating that the carbon intensity of ultra-low sulfur diesel will increase from 100.45 g/MJ to 105.76 g/MJ when the amended regulation becomes effective. ICF (and presumably stakeholders) notified the California Air Resources Board of the fact that part of the carbon intensity change that applies to diesel also needs to be applied to biomass-based diesel, notably the tailpipe greenhouse gas emissions. However, California Air Resources Board staff applied the carbon intensity adjustment incorrectly. This error by California Air Resources Board staff means that the biomass-based diesel deployed in the scenarios using the CATS model should have generated at least another 3.2 million credits during the period 2025–2030. This has significant impacts on the carbon intensity step down analysis for 2025 (and reinforces the need for a modified approach to the Automatic Acceleration Mechanism).

ICF continues to recommend a step down of 10.5% to 11.5% in 2025 to achieve a target credit bank equivalent of 2–3 quarters' worth of deficits.

142.3 This level of stringency is likely what is needed to achieve the stated intent of correcting for the "near-term over-performance" of the program. ICF's analysis indicates that the credit bank will likely continue to build significantly in 2025 if the step down is limited to 5%. ICF analysis suggests that a 6.5% step down is needed to ensure that the credit bank build is flattened in 2025.



ICF recommends that the Automatic Acceleration Mechanism be considered for implementation as soon as 2026, rather than waiting until 2028.

Delaying the implementation of the Automatic Acceleration Mechanism is unnecessary. The risk of a continuous credit bank building through 2027, thereby depressing credit prices for another 3–4 years, outweighs the risk of triggering the mechanism sooner.

142.4

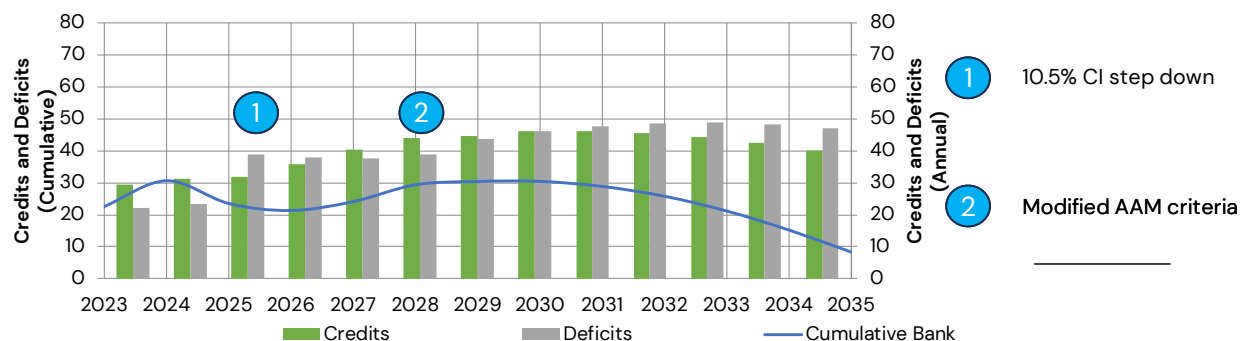
ICF recommends that the Automatic Acceleration Mechanism be implemented on a four-quarter rolling basis.

At the very least, the policy interventions proposed by the California Air Resources Board should be evaluated in the context of the current market to determine if they would have had an impact. As proposed, the Automatic Acceleration Mechanism would not have been triggered based on a review of annual data from 2022, thereby allowing the credit bank to grow during 2023 and again through 2024 with no market correction. If the Automatic Acceleration Mechanism were implemented on a four-quarter rolling basis, then the mechanism would have been triggered sooner and the credit bank build in this hypothetical scenario would have been constrained.

ICF recommends that the first criteria for the Automatic Acceleration Mechanism be modified such that the mechanism is enacted when the credit bank is more than 2.5 times greater than the quarterly deficits generated on a four-quarter rolling basis.

The threshold for the first trigger proposed should be reduced from 3.0 to 2.5 (or lower). ICF disagrees with the underlying presumption that the AAM should be triggered at the proposed threshold i.e., when there are three quarters' worth of deficits in the bank.

The figure below shows the results of ICF's modeling using the *ISOR* Case and focuses on the recommended carbon intensity step down in 2025 (at least 10.5%) and the revised Automatic Acceleration Mechanism recommended based on our analysis.



The figure above has a shape and curve that ICF thinks is more in line with a successful Low Carbon Fuel Standard program i.e., one that maintains a tighter credit-deficit balance and is flexible enough to respond to market conditions in the near-term future (pre-2030), while enabling California to achieve its long-term greenhouse gas emission reduction targets. ICF's view of the market suggests that a focus on an "ideal" credit bank from pre-2021, quantified using a threshold of three quarters worth of deficits, is misguided and may lead to a market that "swings" up and down (as measured by the credit bank) more than necessary, thereby creating market uncertainty for active and would-be participants. Major investments by regulated parties in the last several years have likely improved their respective line of sight on credit generation, thereby reducing the need to carry such a large credit bank.

1 Introduction

The California Air Resources Board (CARB) proposed more ambitious carbon intensity (CI) targets to increase the stringency of the Low Carbon Fuel Standard (LCFS), with the intent of achieving more significant greenhouse gas (GHG) emission reductions in support of California's pursuit of economy-wide carbon neutrality no later than 2045. With respect to CI targets, CARB has proposed three key areas for change:

1. Increased CI stringency by 2030, increasing the target from 20% to 30% by 2030.
2. Additional 5% CI reduction in 2025 from the current CI target, also referred to as the step down. This step down in 2025 will yield an 18.75% CI target in 2025. The step down in 2025 is "in response to the near-term over-performance."
3. Introduction of an Automatic Acceleration Mechanism (AAM) that is designed to trigger a more stringent CI standard in the event of the market over-performing in the future (with over-performance measured by two criteria).

ICF is supporting a coalition of interested parties representing a diverse mix of low carbon fuel producers seeking to understand the potential carbon intensity reduction that could be achieved assuming the likely aggregate deployment of low carbon fuels and supporting technologies. Previously, in an Accelerated Decarbonization *Central Case*, ICF found that a carbon intensity target of 41–44% for 2030 is achievable based on expected fuel volumes and carbon intensity reductions for a wide array of fuel pathways.¹

The initial stages of this project were focused on defining an ambitious CI target for 2030. However, the work presented here builds on previous analysis that ICF presented in response to the Staff Report: Initial Statement of Reasons,² and is focused on information presented at the LCFS Public Workshop on April 10, 2024 ("the April Workshop") and supplemental documentation provided by CARB staff.³ The work presented here focuses on a) commentary on CI changes to ultra-low sulfur diesel (ULSD) and how these changes impacted the CI of biomass-based diesel fuels in the California Transportation Supply (CATS) model, b) commentary on the CI step down in 2025 supported by ICF analysis and

¹ In a *High Case* reflecting updated science and analysis, additional cost effective GHG reduction opportunities, and alignment with proposed federal policies, ICF reported that a carbon intensity reduction of 43% to about 57% could be achieved by 2030.

² Available online at <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/isor.pdf>.

³ Supplemental 2023 LCFS ISOR Documentation.

<https://ww2.arb.ca.gov/resources/documents/supplemental-2023-lcfs-isor-documentation>

c) review of the AAM in light of likely low carbon fuel deployment to California out to 2030 (and beyond).

ICF Commentary on the CATS model

As noted elsewhere, ICF's modeling differs from the modeling conducted by CARB staff using the California Transportation Supply (CATS) model. More specifically, CATS is described as a "transportation fuel supply optimization model" that "minimizes the cost of supplying fuel to meet demand in each year." In other words, given certain modeling constraints, namely a specific CI reduction trajectory and associated policy constraints, the CATS model optimizes compliance accordingly. The CATS model is designed to answer the question: *What is the least-cost compliance pathway associated with a CI target of X in year Y?* ICF notes that CARB has used scenario modeling in previous analyses supporting amendments to the LCFS program and has provided no rationale for switching to an optimization model during the current regulatory amendment process. ICF maintains that an optimization model is not the right approach for target setting because it puts an out-sized impact on the modeling inputs that are used to solve for what is more likely to be a preconceived outcome. Scenario modeling, when done correctly, is more useful to understand market outcomes as they might be, rather than how the author(s) wants them to be.

ICF's reservations about using the CATS model's optimization construct were reinforced by two aspects presented at the April Workshop or in supplementary documentation posted online, as summarized here:

- The CATS model is constrained whereby the number of credits generated in any given year is equal to the number of deficits generated in that same year. Since 2011, the LCFS program has had a single year when annual credits generated nearly equaled annual deficits generated (2017) and a second year (2020) when they were within 1% of each other. In other words, it is unlikely that the credit-deficit balance will be in equilibrium every year as reflected in the CATS model. Regulated parties have varying compliance strategies in the LCFS program, and not a single LCFS compliance strategy employed to date suggests that regulated parties would adopt a position whereby their credit position perfectly matches their deficit position. The CATS model construct is a poor representation of likely LCFS compliance today and into the future.
- CARB staff indicated that the CATS model is incapable of modeling the impacts of the AAM and that their analysis required them to "force" a change in the CATS model framework.

2 ICF Analysis of Information Presented at April Workshop

Incorrect Application of CI Changes to Biomass-Based Diesel

CARB staff published data indicating that the CI of ULSD will increase from 100.45 g/MJ to 105.76 g/MJ⁴ when the amended regulation becomes effective. ICF (and presumably stakeholders) notified CARB of the fact that part of the CI change that applies to ULSD also needs to be applied to biomass-based diesel, notably the tailpipe GHG emissions. However, CARB staff applied the CI adjustment incorrectly. The table below is a condensed version of what is presented in Table B.4 of the reference document.⁵

Lifecycle Stage	CA-GREET 3	CA-GREET 4	Delta	Applies to BBD?
Crude recovery	11.78	12.61	0.83	n
Crude refining	13.57	13.24	-0.33	n
Transport	0.24	0.27	0.03	n
Tailpipe	74.86	79.64	4.78	
CH ₄	0.03	0.01	-0.02	y
N ₂ O	0.72	3.49	2.77	y
CO ₂	74.10	76.14	2.04	n
Total	100.45	105.76	+5.31	+2.74

The tailpipe CH₄ and N₂O emission factors should be applied to tailpipe biomass-based diesel but not CO₂ because it is considered biogenic. That means one should add 2.74 g/MJ to the previous CI values that were being used in the CATS model for biomass-based diesel fuels. However, when CARB updated its modeling, staff modified the CI of “Renewable Diesel” and “Biodiesel” by adding 4.78 g/MJ.⁶ During the April Workshop, CARB staff indicated that they “fixed” the CI value for biomass-based diesel in the CATS modeling and that the result was that it was “about a wash.” After accounting for the 2.04 g/MJ difference in what the CI adjustment for biomass-based diesel should have been, the biomass-based diesel volumes in CARB’s CATS output files for the 5%, 7%, and 9% 2025 CI step down scenarios would have generated an additional 3.21 million, 3.32 million, and 3.35 million cumulative credits between 2025 and 2030 (see table below).

⁴ Technical Support Documentation for Lookup Table Pathways, December 19, 2023. Available online at https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/ca-greet/lut_update_v12192023.pdf.

⁵ *Ibid.*

⁶⁶ For instance, see cells J6, J7, J176, and J177 on the *Fuel Production* tab of the input files e.g., *scenario_inputs_15Day_Proposed_5percent step down.xls*, available online [here](#).

Scenario	2025	2026	2027	2028	2029	2030	Cumulative 2025–2030
5% step down							
BD, Mgal	281	281	281	281	281	281	
RD, Mgal	1,990	1,979	1,769	1,707	1,633	1,457	
+ credits, millions	0.60	0.60	0.54	0.52	0.50	0.46	3.22
7% step down							
BD, Mgal	281	281	281	281	281	281	
RD, Mgal	1,995	1,979	1,962	1,824	1,699	1,457	
+ credits, millions	0.60	0.60	0.59	0.55	0.52	0.46	3.32
9% step down							
BD, Mgal	281	281	281	281	281	281	
RD, Mgal	1,995	1,979	1,962	1,945	1,699	1,457	
+ credits, millions	0.60	0.60	0.59	0.59	0.52	0.46	3.35

142.8
cont. This is a substantial difference in credit generation from 2025 to 2030. By way of comparison, CARB modeling shows credit “Bank Drawdowns” of 8.8 million credits and 19.4 million credits between 2025 and 2030 in the 7% CI step down and 9% CI step down scenarios, respectively.

2025 CI Step Down

142.9 To ICF’s knowledge, CARB staff has not defined the objective of the CI step down in 2025. The Staff Report notes that it is “in response to the near-term over-performance” in the LCFS market and that it will “further support ambition.” However, there is no clear objective. Without a clear objective, stakeholders are left to choose from the CI step down menu provided by CARB staff at the April Workshop: 5%, 7%, or 9% CI step down in 2025. However, without a clear objective to evaluate the CI step down against, stakeholders are left with a false choice.

142.10 As noted previously, the incorrect CI adjustment for biomass-base diesel fuels discounted 3.3 million credits that should have been generated.⁷ After one increases LCFS credit generation accordingly, then the 7% and 9% CI step down scenarios presented by CARB staff are likely to yield a credit bank drawdown of about 6 million and about 16 million

142.5
cont. ⁷ ICF notes that because the CATS model is an optimization model, that even after CARB staff correct for the CI of biomass-based diesel fuels in their modeling, the net credit-deficit generation will likely be unchanged in the model outputs. The model will either a) decrease biomass-based diesel volumes to account for increased credit generation or b) decrease credit generation from another source to offset the additional credit generation from the lower CI for biomass-based diesel. This highlights the deficiency of using an optimization approach for this type of rulemaking.

142.10
cont.

credits out of the system, respectively. The former (in the 7% CI stepdown scenario) is not enough of a credit bank drawdown to stabilize the market and the latter (in the 9% CI step down scenario) is more appropriate based on criteria that ICF has established in our consideration of a CI step down in 2025 i.e., that at the end of 2025, the bank drawdown should leave about two quarters worth of deficits in the credit bank.

ICF continues to recommend a step down of 10.5%–11.5% to reduce the cumulative bank of credits to the range of 2–3 quarters' worth of deficits by the end of 2025.

142.11

ICF views the 2025 CI step down as a critical juncture for the program. In our modeling, we first evaluated the following:

1. What is the impact of the 5% CI reduction step down proposed in the Staff Report, yielding an 18.75% CI target in 2025?

As of the end of 4Q 2023, the credit bank has exceeded 23.5 million credits, with a record bank build of nearly 3 million credits in the most recent quarter for which data are available. ICF forecasts that the program will have a bank of about 29–30 million credits by the end of 2024. ICF analysis suggests that the 5% CI step down will slow the bank build by about 50% compared to previous years; however, the credit bank is still likely to grow by nearly 4 million credits by the end of 2025.

ICF then sought to determine two things with our analysis:

2. What CI step down is necessary to flatten the credit bank in 2025?
3. What CI step down is necessary to decrease the bank of credits to two quarters' worth of deficits?

With respect to the former, ICF modeling sought to identify the level of CI reduction that would be needed for the step down to *at least* flatten the curve of growing credits. ICF analysis shows that a CI step down of 6.25–7.25% (i.e., a CI reduction of 20% to 21% in 2025) is likely needed to ensure that the credit bank does not continue to build.

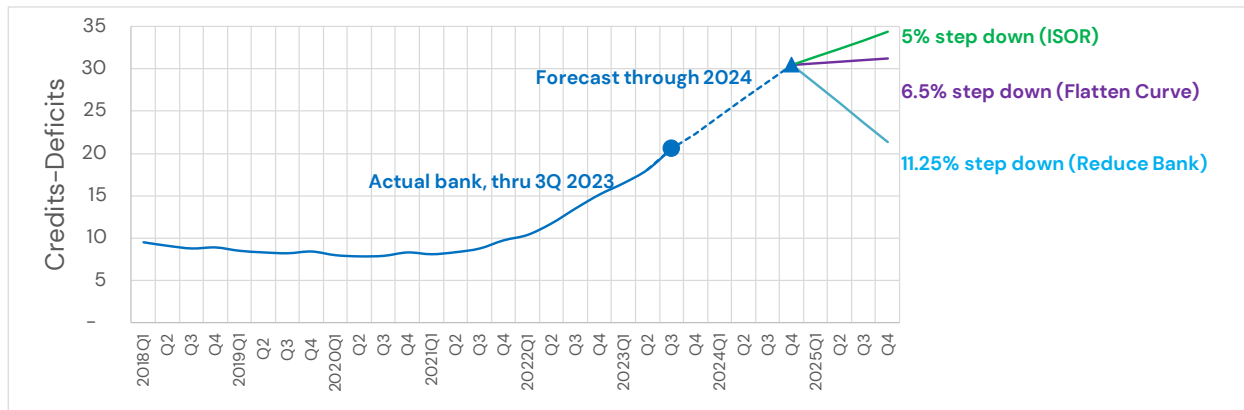
With respect to the latter, ICF sought to identify the level of CI reduction that would be needed for the 2025 CI step down to reduce the bank of credits to about two quarters' worth of deficits by the end of 2025. ICF analysis shows that a CI step down of 10.5% to 11.5% (i.e., a CI reduction of 24.25% to 25.25% in 2025) is likely needed to ensure that the credit bank reverses and that the bank is drawn down to a level that is in line with a credit bank of only two quarters' worth of deficits. This level of stringency, while seemingly high, is likely what is needed to achieve CARB's stated intent of correcting for the "near-term over-performance" of the program.

The figure below illustrates the three aspects of the 2025 CI step down evaluated by ICF: the blue line shows the current credit bank inventory (20 million credits), the dotted blue

142.11
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line shows ICF forecasted credit bank by the end of 2024 (30 million credits), the green line shows the likely growth of the credit bank using CARB's proposed step down in 2025 (5% step down to 18.75% CI reduction), the purple line shows what ICF analysis indicates is needed to flatten the credit bank (6.5% step down to 20.25% CI reduction), and the light blue line shows that a CI step down of 11.25% to a 25% CI step down is needed to restore the program to an appropriate credit bank balance.

Figure 1. ICF analysis of the CI step down in 2025



Automatic Acceleration Mechanism

The AAM is designed to accelerate the stringency of the LCFS program when certain criteria are met. CARB defined two criteria in the Staff Report: 1) when the credit bank at the end of a calendar year is more than 3 times greater than the quarterly deficits generated in the same calendar year and 2) when credit generation in a calendar year exceeds deficit generation in that same calendar year. The Staff Report also indicates that the first year during which the CI reduction schedule can be impacted is in 2028, based on a review of annual data from 2026 that would occur in 2027.

Evaluating LCFS program data from the end of 2022 indicates that the AAM would NOT have been triggered as currently constructed. The first trigger is defined as follows in the proposed regulation:

142.12

$$\text{Trigger 1, } \frac{\text{Credit Bank}_{20xx}}{(0.25 \times \sum \text{Deficits}_{20xx})} > 3$$

The cumulative credit bank ($\text{Credit Bank}_{20xx}$) is divided by the product of 0.25 and the sum of deficits generated in the year of interest ($\sum \text{Deficits}_{20xx}$). In May 2023, an evaluation of data from 2022 would have yielded a value of 2.9, and the AAM would not have been enacted, thereby allowing the credit bank build that occurred during 2023 to continue unabated until an adjustment could have been made based on analysis today (i.e., in May 2024), with the AAM being triggered and taking effect on January 1, 2025 in this

hypothetical scenario. This is as clear as an analysis that the AAM as proposed is inadequate.

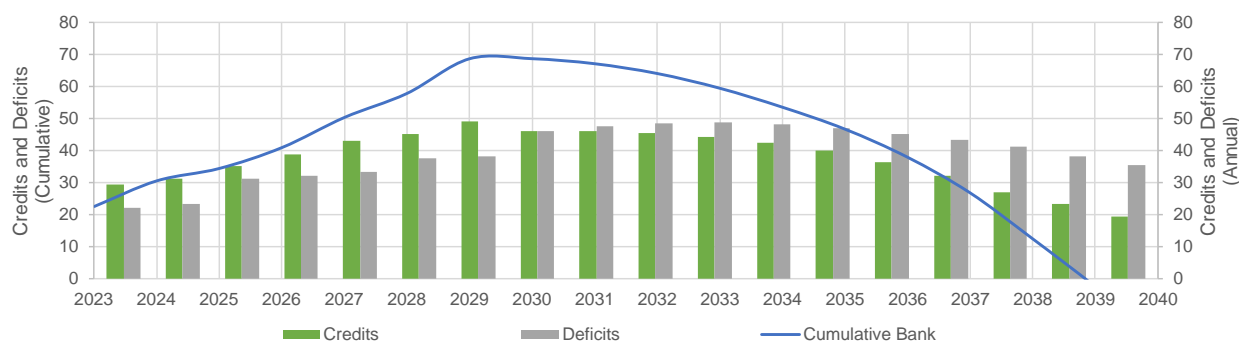
ICF recommends that a) the AAM be considered for implementation as soon as 2026, rather than waiting until 2028, regardless of the 2025 CI step down, b) the AAM be implemented on a four-quarter rolling basis, and c) that the value in Trigger 1 (in Section 95484(b)(2)(A) be decreased from 3.0 to 2.5.

Implement the AAM Immediately

There is no need to delay AAM implementation. The risk of the 2025 CI step down “missing” and not correcting the current over-performance of the program (and leading to credit bank builds in 2026 and 2027) outweighs any downside risks to implementing the AAM immediately.

Building on commentary regarding the CI step down in 2025, ICF’s analysis indicates that if CARB keeps the 5% CI step down in 2025, that the credit bank will build in 2025, 2026, and 2027. In fact, by the end of 2027, ICF analysis suggests that the credit bank will reach 45–50 million credits. This will trigger the AAM in 2028 (based on 2026 data). ICF analysis suggests that the bank will be triggered again in 2029 or 2030 (based on data for 2028 or 2029)–getting the program to a 39% CI standard by 2030. The figure below shows the credit and deficit generation annually (green and grey bars, respectively) and the associated credit bank (blue line) using CARB’s CI trajectory, including the CI step down in 2025, and the AAM as proposed.

Figure 2. Credit-Deficit Balance in the ICF ISOR Case

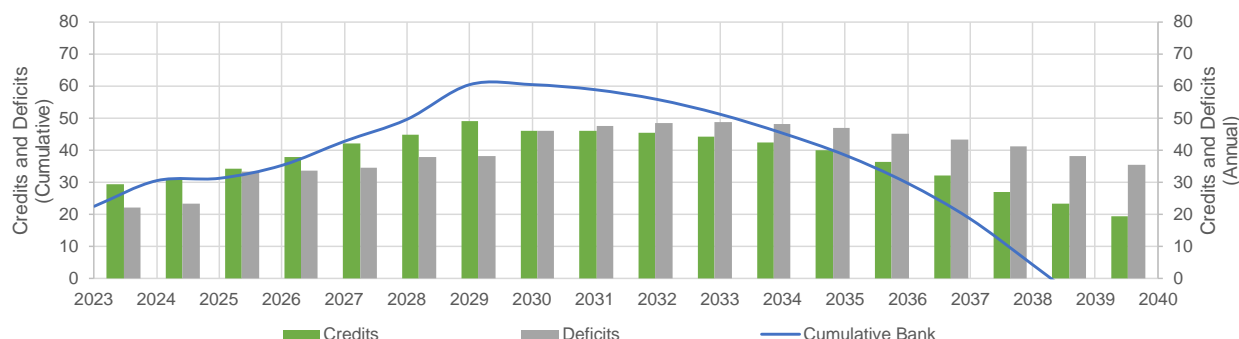


In the long-term future, the AAM modifies the trajectory of the program post-2030. However, the short-term impact is muted and the CI step down does not achieve the objective of reversing the credit bank, and delaying the AAM until 2028 slows credit growth, but does not reverse the credit bank build until 2031. The shape of the curve in the figure above is appropriate, but the magnitude of the credit bank is too high to drive higher credit prices.

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Implementing a more stringent CI step down in 2025 will reduce credit generation but will still likely lead to credit generation post-2025, and the AAM will be inadequate to reverse the credit bank build until 2030.

Figure 3. Credit-Deficit Balance in the ICF ISOR Case, with 6.5% CI stepdown in 2025

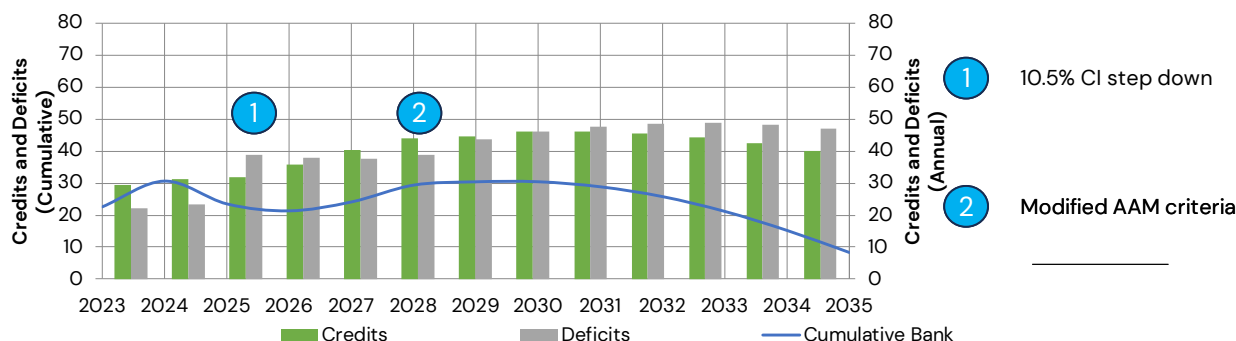


ICF analyzed the ISOR Case using the following assumptions:

- A CI stepdown of 10.5% in 2025 that would require a CI reduction of 24.25%. We adjusted the targets between 2026 and 2030 linearly while maintaining the 30% CI reduction in 2030 and post-2030 CI reduction schedule included in the Staff Report.
- An AAM that is implemented similarly as to what is used in the Staff Report, but adjusting the threshold to being triggered when the credit bank is more than 2.5 times greater than the quarterly deficits generated in a given year.

The figure below shows the results of the ISOR Case using the parameters described above.

Figure 4. ICF ISOR Case with larger CI step down and modified AAM



142.14
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The figure above has a shape and curve that ICF thinks is more in line with a successful LCFS program i.e., one that maintains a tighter credit-deficit balance and is flexible enough to respond to market conditions in the near-term future (pre-2030), while enabling California to achieve its long-term GHG reduction targets. A similar trajectory can be achieved with a shallower step down in 2025, but with an AAM that comes into place in

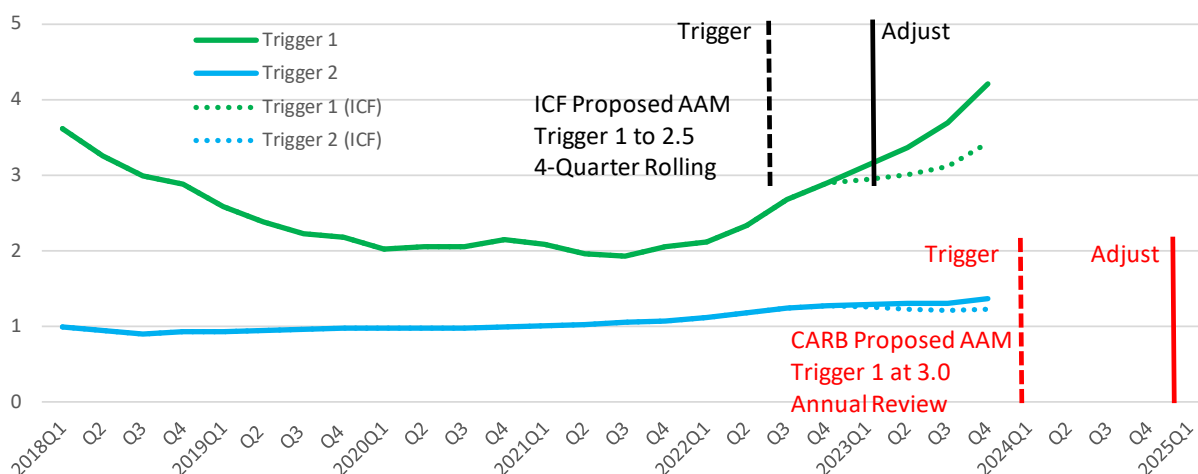
2026 and an even lower threshold of the first criteria that would trigger the AAM (e.g., lowering the value from 2.5 to 2.0).

AAM on a Four-Quarter Rolling Basis

•ICF recommends that the AAM be considered on a four-quarter rolling basis, rather than on an annual basis. If the criteria for the AAM are met on a four-quarter rolling basis, then the change in the CI would be implemented on January 1st of the next calendar year after the criteria are met.

142.15 Evaluating the AAM triggers annually risks missing a credit bank build and not allowing for a correction for a full two years. The example provided above for 2022 is shocking: The first trigger would not have been met evaluating data from 2022. That means the credit bank build in 2023 occurred as it has, depressing the market, and the AAM trigger occurs in May 2024, making any changes effective Jan 1, 2025 (see figure below). That means the proposed policy correction would have been inadequate to prevent the specific over-performance in the market that CARB staff references in the Staff Report. However, if the AAM analysis was done on a four-quarter rolling basis, and the more sensitive criteria for the AAM were employed (see below), then the AAM trigger would have been identified based on 3Q 2022 data and the change would have occurred January 1, 2023. ICF estimates that this proposed approach would have reduced the bank build in 2023 by about one third or 2.6 million credits (see figure below).

Figure 5. Illustrative Results of Different Approaches to the Automatic Acceleration Mechanism



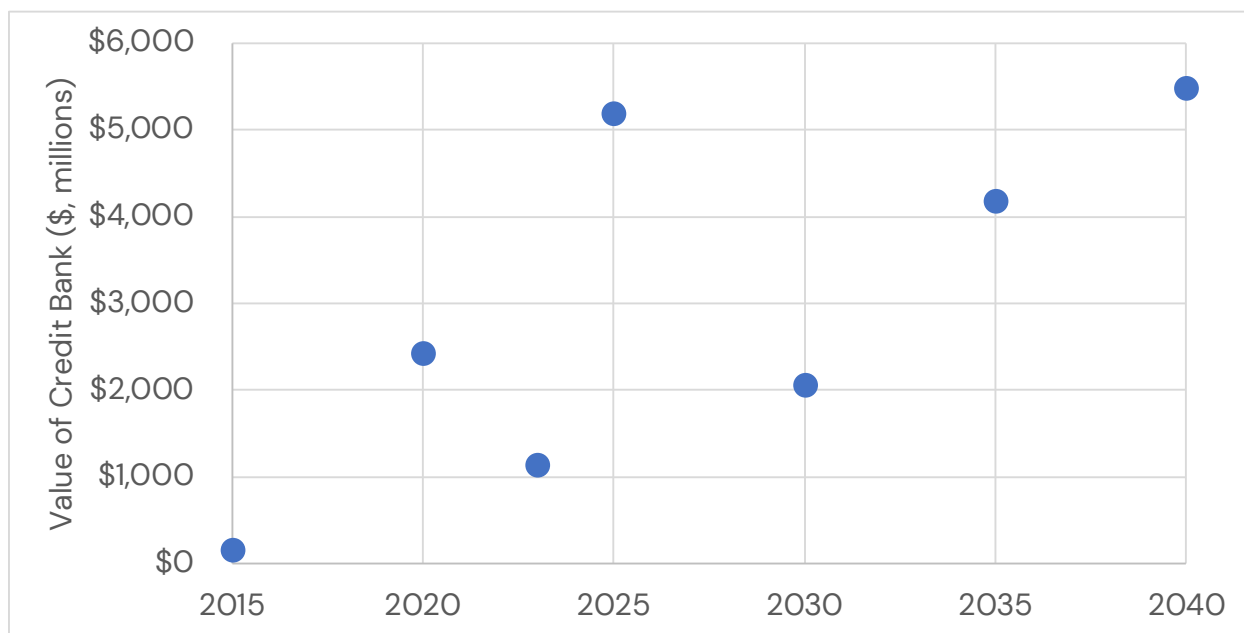
The credit bank would still have increased substantially in 2023 based on ICF's proposed AAM, but that reinforced the need for a more aggressive CI step down, rather than further adjustments to the AAM.

142.15
cont. ICF's proposed approach reduces the potential for a future credit bank build in a more efficient manner than CARB's proposed intervention. CARB is proposing policy interventions that are too slow to provide a market correction needed to ensure more predictable credit-deficit supply dynamics.

Implement More Sensitive Criteria in the first AAM Trigger

142.16 The threshold for the first trigger proposed should be reduced from 3.0 to 2.5. ICF disagrees with the underlying presumption that the AAM should be triggered at the proposed threshold i.e., when there are three quarters' worth of deficits in the bank. Based on information presented at the May 23, 2023 modeling discussion, the AAM design is looking to program data from prior to 2021 as an indicator of an "ideal" bank of credits. ICF views this as a critical mistake with respect to how the market is likely to unfold in the future. From a market perspective, if we consider the credit bank as a measure of the risk that regulated parties (i.e., refiners) bear in order to do business in California, then the credit bank should be measured in dollars, not credits/deficits. The figure below shows the estimated value of the credit bank in five-year increments from 2015 to 2040. The data for 2015 and 2020 are based on data reported by CARB for both deficits and credits; whereas the data for 2025 to 2040 is based on the deficit generation in ICF's analysis of the proposed CI reduction trajectory and the credit price reported by CARB in the Staff Report. All values are reported in real dollars using 2021 as the basis year (\$2021).

Figure 6. Estimated value of LCFS credit bank as a proxy for refiner risk tolerance



A target credit bank of three quarters worth of deficits in 2015 would have been valued at \$140 million; by 2020, the value of the bank grew to \$2.4 billion. In 2023, ICF estimates that

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a credit bank with three quarters worth of deficits is valued at \$1.1 billion. Based on CARB's forecasted credit price, the value of a credit bank of three quarters worth of deficits in 2025 would rise to \$5.2 billion before collapsing back to \$2.1 billion in 2030. The higher pricing reported by CARB in 2035 and 2040 yields an "ideal bank" valued at \$4.2 billion and \$5.5 billion. When viewed from the lens of dollars tied to risk, rather than risk tied to a specific credit bank, the target bank of three quarters worth of deficits does not make sense. By 2035, for instance, petroleum products will have decreased substantially due to efficiency gains, increased liquid biofuel blending, and transportation electrification. ICF estimates that gasoline consumption may decrease by up to 50% by 2035, while ULSD consumption could decrease by as much as 85% by 2035 (compared to 2022 consumption). Why would an industry that has lost so much market share increase the value of its risk burden by nearly a factor of four over that same time frame?

In line with ICF's hypothesis that the AAM should consider the "ideal credit bank" in terms of managed risk (as measured in dollars' worth of exposure), we also believe that the proposed AAM fails to recognize the evolution of the market post-2020. Consider that in 2018:

- The average CI of ethanol was nearly 70 g/MJ
- Biodiesel volumes were averaging around 5% blend rates in California
- There were 2-3 renewable diesel producers delivering product to California
- The first fuel pathway for RNG from animal manure was submitted and approved by CARB
- EVs represented just 7% of new light-duty vehicle sales
- Off-road electrification applications generated about 500,000 credits

Most of the refiners in the LCFS program had limited visibility with respect to LCFS credit generation and were forced into a position of purchasing LCFS credits from a limited market. As a result, refiners generally opted to build substantial credit banks as part of their compliance strategy. This strategy enabled other market participants to benefit via an increased credit price. However, in the interim years, refiners have made substantial investments that give them a clearer line of sight in their credit generation. The table below highlights the key investments that six refiners have made since 2018; these refiners represent what ICF estimates to be more than 90% of the obligation in the LCFS program. This is not meant to be an exhaustive list, rather it illustrates key investments that will impact LCFS credit generation moving forward.

Obligated Party	Key Investment since 2018
Marathon	<ul style="list-style-type: none"> • Retrofitted Dickinson facility for RD production • Martinez Renewables joint venture with Neste in California • Acquired RNG platform (LF Bioenergy)
Chevron	<ul style="list-style-type: none"> • Acquired REG, largest biodiesel producer in US • Converting diesel hydrotreating unit for renewable diesel / renewable jet fuel production at El Segundo • Investments in RNG platforms including California Bioenergy, Brightmark Energy • Acquired natural gas fueling assets via deal with Mercuria
PBF ⁸	<ul style="list-style-type: none"> • St. Bernard Renewables project in Louisiana producing RD
Valero	<ul style="list-style-type: none"> • Expanded Diamond Green Diesel (a joint venture with Darling Ingredients) at Norco, Louisiana • Commissioned Port Arthur project with expected completion in 2025
Phillips 66	<ul style="list-style-type: none"> • On the verge of completing Rodeo Renewed project at San Francisco Bay Area refining complex, converting to renewable fuels entirely
BP	<ul style="list-style-type: none"> • Expanded co-processing capabilities at Cherry Point • Purchased RNG platform via Archaea acquisition

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It is clear from this table that there is a much clearer line of sight to LCFS credit generation for regulated parties today in 2024 than there was in 2018. The view of the credit-deficit balance from pre-2021 will not be a good indicator of how the market will evolve moving in 2025 and beyond.

⁸ Shell sold its Martinez Refinery and related logistics assets to PBF in 2021.

Appendix

Background on ICF modeling

ICF models the CI reductions that could be achieved using the structure of the LCFS program. The modeling is driven by the demand for transportation fuel in California, which is a function of many variables including but not limited to economic growth, vehicle miles traveled (VMT), vehicle fleet turnover, and the expected compliance with complementary policies that impact transportation fuel demand. ICF's modeling is initiated using documentation associated with the Emissions FAcTOr model (EMFAC)⁹ that is publicly available for download. The EMFAC model is "developed and used by CARB to assess emissions from on-road vehicles including cars, trucks, and buses in California." The EMFAC model enables ICF to characterize top-level transportation fuel demand in California given baseline consideration of the aforementioned key factors, like VMT and fleet turnover. Although EMFAC2021 incorporates expected compliance with several regulations that decrease fossil fuel demand, like the Advanced Clean Truck (ACT) Rule and the Innovative Clean Transit (ICT) Rule, it does not include expected compliance with Advanced Clean Cars II (ACC2) or Advanced Clean Fleet, which were adopted by the Board in 2022 and 2023, respectively. ICF has modified EMFAC2021 to ensure compliance with ACC2 and ACF. ICF then pairs the fleet turnover and fuel demand functions of EMFAC with supply-cost curves for low carbon fuels, including ethanol, biodiesel, renewable diesel, and renewable natural gas (RNG).

ICF previously modeled multiple scenarios for this project and framed each as *Accelerating Decarbonization* in the transportation sector using a diverse array of low carbon fuel strategies that are viable in the timeframe contemplated. Within this framework, ICF presented a Central Case and High Case(s).

- *Accelerating Decarbonization, Central Case*: ICF's primary focus is this case, whereby we limited our consideration of low carbon fuel strategies that require expanded deployment, reasonable technological advancement, and limited, if any, substantive policy changes.
- *Accelerating Decarbonization, High Case(s)*: In these cases, ICF considered additional strategies and/or policy changes that would lead to higher deployment of low carbon fuels and/or greater CI reductions over the course of the analysis. These included but were not limited to reductions in indirect land use change (ILUC) accounting, resumption of FFV manufacturing by OEMs, and relaxation of

⁹ ICF is using the most recent version of EMFAC, EMFAC2021 (v1.0.2) as a starting point for our modeling. The EMFAC model is available for download [online](#).

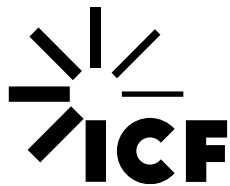
deliverability requirements for electricity used as a transportation fuel and as a processing fuel. Together, these represent a more expansive market and aggressive outlook for decarbonizing the transportation sector.

Stakeholder Outreach

ICF retains exclusive decision-making with respect to the parameters that are included in (or excluded from) the modeling in this project. However, as part of the development of our modeling, we sought (and will continue to seek) input and feedback from stakeholders that are uniquely positioned to characterize trends, constraints, and opportunities across various low carbon fuels. ICF conducted interviews with stakeholders from various low carbon fuel providers. Through these conversations, ICF introduced the broader project objectives and ICF's modeling approach to help stakeholders understand the key drivers for our analysis. ICF then led a discussion guided by the following questions:

- **Deployment.** What are expected changes in the industry that will increase or decrease the deployment of a particular fuel or fuel/vehicle combination? These generally include supply and demand considerations and should account for opportunities and barriers to the extent feasible. What is the timeframe associated with any changes?
- **Carbon intensity.** What is the current and projected carbon intensity of the fuel under consideration? Are there any California-specific policy or regulatory changes that can be accommodated to help achieve these reductions? What is the rate at which these carbon intensity changes are likely to occur?
- **Demand from Other Markets.** Where are the developments likely to occur? Are there any specific advantages or disadvantages associated with delivering these solutions to California that ICF needs to consider? To what extent will other (existing or potential) low carbon fuel markets be advantaged or disadvantaged as it relates to these solutions as a function of their corresponding geography?

Lastly, it is important to note that ICF developed the modeling framework used in this study based on publicly available tools and data—we have purposefully excluded any proprietary data or considerations as part of this analysis.



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MONTANA RENEWABLES™

Montana Renewables, LLC
1807 3rd St NW, Great Falls, MT 59404
<https://montana-renewables.com/>

May 10, 2024

Via electronic submission to: <https://ww2.arb.ca.gov/public-comments/low-carbon-fuel-standard-workshop-april-10-2024>

Dr. Steven Cliff
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Proposed Low Carbon Fuel Standard Amendments

Dear Dr. Cliff,

Montana Renewables, LLC ("MRL" or "the Company") appreciates the opportunity to comment on proposed amendments to the California Low Carbon Fuel Standard ("LCFS"). MRL previously provided comments on the proposed amendments in our letter dated February 20, 2024, a copy of which is included as Attachment "A" and which is reincorporated herein without change. Our present comments focus specifically on several points raised during the California Air Resources Board's ("CARB") April 10th workshop on the proposed amendments, including information provided in the staff presentation and other supporting materials released in connection with the workshop.

Balance Increasing Stringency with Preserving Opportunities for Sustainable Aviation Fuels

During the workshop, staff presented scenarios examining a 7% versus a 9% "stepdown" in 2025, both steeper than CARB originally proposed in the amendments package posted in December. Staff also presented a potential scenario featuring a 5% stepdown coupled with two "automatic adjustment mechanism" ("AAM") triggers. All of these scenarios were presented in the context of a 30% emission reduction goal by 2030.

143.1

MRL appreciates CARB's continued efforts to find a balance between achievable near-term emission reductions and long-term sustainable growth in the low carbon fuel sector. As noted in our February 20th comment letter, MRL is supportive of measures to increase the stringency of the annual standards. We are alarmed, however, with the modeling inputs that CARB released with other workshop materials – specifically, the LCFS benchmarks indicating that CARB intends to apply the same annual emission reduction targets to diesel and jet fuel. (See, for example, the LCFS benchmarks tab of the "Updated Proposed Scenario with 5% step-down", located here: https://ww2.arb.ca.gov/sites/default/files/2024-04/scenario_inputs_15Day_Proposed_5percent%20step%20down.xlsx.)

The LCFS annual benchmarks have historically applied equally to both non-exempt fossil fuels and their renewable equivalents. As examined further below, if CARB continues this approach and finalizes the benchmarks as reflected in the modeling inputs, the amendments will dramatically shift incentives away from sustainable aviation fuel ("SAF") at a time when they are critically needed.

Table 1 below shows the current standards and the proposed “new” standards from the above-cited modeling inputs:

Table 1: LCFS Benchmarks, 5% Stepdown Scenario

	Gasoline Existing	New Gasoline	Diesel	New Diesel	Jet	New Jet
2020	91.98	91.98	92.92	92.92	89.37	89.37
2021	90.74	90.74	91.66	91.66	89.37	89.37
2022	89.5	89.5	90.41	90.41	89.37	89.37
2023	88.25	88.25	89.15	89.15	89.15	89.15
2024	87.01	87.01	87.89	87.89	87.89	87.89
2025	85.77	80.56	86.64	85.93	86.64	72.66
2026	84.52	78.33	85.38	83.55	85.38	70.65
2027	83.28	76.10	84.13	81.17	84.13	68.64
2028	82.04	73.87	82.87	78.79	82.87	66.63
2029	80.8	71.64	81.62	76.41	81.62	64.61
2030	79.55	69.41	80.36	74.03	80.36	62.60
2031	79.55	64.94	80.36	69.27	80.36	58.58
2032	79.55	60.48	80.36	64.51	80.36	54.55
2033	79.55	56.02	80.36	59.75	80.36	50.53
2034	79.55	51.56	80.36	55.00	80.36	46.50
2035	79.55	47.10	80.36	50.24	80.36	42.48
2036	79.55	42.63	80.36	45.48	80.36	38.45
2037	79.55	38.17	80.36	40.72	80.36	34.43
2038	79.55	33.71	80.36	35.96	80.36	30.41
2039	79.55	29.25	80.36	31.20	80.36	26.38
2040	79.55	24.79	80.36	26.44	80.36	22.36
2041	79.55	21.81	80.36	23.27	80.36	19.67
2042	79.55	18.84	80.36	20.09	80.36	16.99
2043	79.55	15.86	80.36	16.92	80.36	14.31
2044	79.55	12.89	80.36	13.75	80.36	11.63
2045	79.55	9.91	80.36	10.58	80.36	8.94
2046	79.55	9.91	80.36	10.58	80.36	8.94

When renewable diesel and SAF are produced from the same feedstocks and production processes at a facility, CARB’s GREET model assigns both products the same carbon intensity (“CI”) score. For example, in MRL’s case, our U.S. tallow-based renewable diesel and SAF are both scored at 37.33 gCO₂e/MJ. Comparing this singular score against the “new diesel” and “new jet” standards above, the impact should be immediately evident – SAF would have a significantly lower crediting opportunity compared to renewable diesel, potentially as early as next year. These standards would also hasten the timeframe for certain SAF feedstock pathways to flip from credit-generating to deficit-generating, which will disincentivize deployment in California and instead encourage producers to seek alternative markets.

We understand CARB’s intent in applying the same percentage emission reduction targets to all obligated fuels. However, given that RD and SAF are functionally equivalent enough that they are assigned the same CI scores for their LCFS pathways, we recommend that CARB clarify its rulemaking and allow the “new diesel” standards – regardless of the stepdown scenario that CARB ultimately chooses – to be the applicable benchmark against which both RD and SAF are evaluated for crediting purposes. Alternatively, CARB could choose to publish a standalone SAF benchmark, or roll out the “new jet” standards at a slower pace to preserve SAF’s crediting opportunities. In any case, CARB should not adopt standards that so heavily tilt against SAF, especially given its proven air quality benefits and the key role it has to play in decarbonizing the aviation sector.

Crop-Based Feedstock Sustainability Requirements Should Open the Door to New Benefits

143.3

CARB's presentation included several points of clarification and additional information that elaborated on the sustainability requirements included in its December proposal. We appreciate this information, in particular CARB's acknowledgement that the new requirements will leverage existing certification programs (such as ISCC, RSB, etc.). While such programs are gaining in familiarity and adoption in the feedstock supply chain, we reiterate the request from our February 20th letter in asking CARB to ensure that sufficient lead time is given to allow for widespread adoption of certification regimes in advance of CARB's effective date for their implementation. We also ask again for CARB to consider national-level exemptions for lower-risk U.S. and Canadian crop feedstocks.

143.4

The staff presentation also included discussion on a possible re-evaluation of Land Use Change ("LUC") emission factors for regions outside of those that were part of the CARB's 2015 analysis areas, and discussion on a mechanism for assigning higher LUC scores for higher-risk crop-based feedstocks. Without directly commenting on such measures, we ask CARB to be open to considering *lower* LUC scores for lower-risk crop feedstocks and/or crop-growing areas (such as the U.S. and Canada). Recognizing the maturity and sophistication of the U.S. and Canadian agricultural sectors should unlock the carbon reducing benefits of crop management practices and second-season/cover crops, such as camelina, in future CI scores for renewable diesel and SAF.

* * *

Thank you for considering these comments. We look forward to working collaboratively with CARB throughout this rulemaking process. Please do not hesitate to contact us with any questions.

Regards,



Greg Staiti
Compliance Director, MRL

Attachment: February 20th Comments of Montana Renewables, LLC

Attachment A: Copy of MRL's February 20th Comments



MONTANA RENEWABLES™

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February 20, 2024

Via electronic submission to: <https://ww2.arb.ca.gov/lispub/comm/bclist.php>

Dr. Steven Cliff
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Proposed Low Carbon Fuel Standard Amendments

Dear Dr. Cliff,

Montana Renewables, LLC (“MRL” or “the Company”) appreciates the opportunity to comment on proposed amendments to the California Low Carbon Fuel Standard (“LCFS”). Since beginning commercial production little more than a year ago, MRL has established itself as a significant contributor of renewable diesel to California markets. Moreover, with sustainable aviation fuel (“SAF”) production capacity amongst the largest in the nation, MRL is positioned to be a leading producer of this emerging and critically important low carbon fuel.

MRL is one of the true success stories of the LCFS program. Our parent corporation, Calumet Specialty Products Partners, L.P., (“Calumet”) has operated a conventional oil refinery in Great Falls, Montana, for over a decade and in that time has provided high quality fuels and other products within its predominantly Montana/Upper Rockies service area. Thanks in large part to the incentives offered and demand created by the LCFS program and others like it, Calumet embarked on a bold plan to convert part of the Great Falls refinery to produce fuels from 100% renewable biomass, announcing the formation of MRL in November 2021. The result is a 15,000 bpd capacity renewable plant producing fuels from a wide range feedstocks (including animal fats, distiller’s corn oil and canola) whose products are now sold by our offtakers in California, Oregon, Washington and British Columbia. The Company is not content to have merely joined the growing contingent of refiners that have announced plans to convert assets to produce renewable fuels; we have put our plans into action in near-record development time and have innovated along the way, including:

- steam methane reformer upgrades completed in March 2023 that have allowed MRL to become fully self-sufficient in its hydrogen needs;
- the installation of SAF assets in April 2023, allowing co-production of SAF with renewable diesel;
- the addition of on-site feedstock pretreatment capabilities in May 2023 using first-of-its-kind technology that should reduce energy consumption compared to traditional pretreatment processes; and,
- the first receipt of camelina oil in September 2023, which has great future promise to produce low carbon fuels from a sustainable feedstock that does not compete with traditional food crops.

We appreciate the efforts of the California Air Resources Board (“CARB”) staff in engaging in a thorough stakeholder outreach program last year and recognize the significant commitment of time and resources that have gone into preparing the proposed amendments. The thrust of our comments today focus on expanding opportunities for SAF, as well as several other targeted regulatory measures to enhance incentives, increase transparency, and lower compliance burdens.

Expanding Opportunities for Sustainable Aviation Fuel

CARB's amendments propose to eliminate a long-standing exemption for conventional jet fuel, beginning in 2028, used for intrastate flights (meaning flights taking off and landing in California). We recognize that jurisdictional constraints may limit CARB's authority to impose new obligations on conventional fuels used in other flights. However, even within these limits, we respectfully believe that CARB could go further and faster to improve the incentive structure for SAF.

To start, we believe it is unnecessary to delay obligations for three years after the expected effective date of the amendments (January 1, 2025). For comparison, the original LCFS regulations – imposing entirely new and unfamiliar requirements throughout the fuel supply chain and for renewable fuel producers outside of California – were originally adopted in 2010 and obligations became effective January 1st of the following year. Against this backdrop, a three-year lead-in for jet fuel only if used in intrastate flights, within the context of a well-established program, seems unnecessary. We request that CARB reconsider whether a two- or even a one-year delay in implementation would better serve the state of California's overarching objective of reducing the carbon emissions from the aviation sector while still providing sufficient time for new and existing regulated parties to adjust to their obligations.

Besides the timing for implementation, we believe there are more targeted measures that CARB could take to support the rapid development and deployment of SAF. The proposed changes would, at best, only create indirect demand for SAF. Regulated parties for non-exempt conventional jet fuel would be under no compulsion to actually buy or blend SAF; they could simply purchase LCFS credits generated for wholly unrelated fuels to satisfy their newly created annual deficit obligations. Spurring investment and making a market for an emergent fuel requires policies with concrete obligations. The European Union and British Columbia have both recognized this in their respective renewable and low carbon fuel programs, each recently adopting a form of direct blending mandate for SAF. Consequently, we have over the last few months begun seeing a tremendous push from our offtakers and other market participants to ensure that SAF will be eligible in each jurisdiction. If California is to compete on even terms with these programs over the long term, CARB must keep the LCFS incentives structure on par. Even if CARB is unable to directly adopt a blending mandate within its current legal framework, it could achieve similar results by requiring regulated parties for conventional jet fuel to satisfy a percentage of their annual deficits via LCFS credits generated for SAF.

Beyond new incentives for blending SAF into the California aviation pool, CARB should review and align aspects of the LCFS regulatory framework to better allow producers to optimize the production of SAF (and therefore help defray its higher production cost on average compared to renewable diesel). To this end, we believe that CARB's final rule should address the allocation of commingled feedstocks to multiple product outputs from a production facility. The existing LCFS regulations begin to tackle this issue in Sections 95488.4(d) (setting forth the general rules for commingled feedstock allocation) and 95491(d)(1)(C) (providing an allocation formula to be applied each calendar quarter). These rules are a reasonable accommodation to the reality that fuel producers rarely can segregate and batch-run individual feedstocks. The rules and CARB's related interpretive guidance (see LCFS Guidance 19-08) further allow producers to optimize the feedstock-to-fuel allocations for shipments to California, as long as a quarterly material balance is maintained. However, neither the existing rules nor guidance directly address situations like MRL's and many other renewable distillate producers, where more than one fuel product is produced in a quarter.

Two types of feedstock allocation methodologies addressing multiple product outputs have emerged under other programs. The “proportional allocation” methodology requires allocation of each feedstock used in the same proportions as products produced in a given quarter; Table 1 below provides an illustrative example for a generic producer of renewable diesel (RD), SAF and renewable naphtha (RN)¹:

Table 1: Proportional Allocation Methodology Example

Feedstock Type	Feedstock Qty (gal)	RD Volume (80% Yield)	SAF Volume (15% Yield)	RN Volume (5% Yield)
Soy	35,000	28,000	5,250	1,750
Canola	40,000	32,000	6,000	2,000
Tallow	25,000	20,000	3,750	1,250

In the above scenario, the producer would be limited to allocating only 3,750 gallons out of 25,000 gallons worth of tallow – the best performing feedstock from a carbon intensity perspective – to SAF production. Compare this outcome with a “free allocation” methodology, which still requires a producer to fully account for all feedstocks used in a quarter but gives the producer greater flexibility to assign those feedstocks to product output, as depicted in Table 2 below:

Table 2: Free Allocation Methodology Example

Feedstock Type	Feedstock Qty (gal)	RD Volume (80% Yield)	SAF Volume (15% Yield)	RN Volume (5% Yield)
Soy	35,000	35,000	0	
Canola	40,000	35,000	0	5,000
Tallow	25,000	10,000	15,000	0

The benefits to the producer under free allocation should be obvious. But so, too, should the benefits to California if the state truly wishes to incentivize more SAF production and consumption. By allowing the allocation of the lowest-carbon feedstocks to SAF, producers will be better able to cover the higher average cost of production and would be better incentivized to expand SAF production capacity. Neither allocation methodology would alter a producer’s overall feedstock mix nor impact calculation of CI in the GREET model; the methodologies are simply about how to assign feedstocks from the mix to different product outputs. Feedstock usage still would remain subject to annual verification to ensure quarterly material balances are maintained. And in many ways, adopting a free allocation methodology would harmonize California’s approach with other jurisdictions and programs (such as the ISCC CORSIA and PLUS protocols and the emerging Canadian Clean Fuels Regulation) that in meaningful ways are competitors for nascent SAF supply. We urge CARB to take the opportunity afforded by this amendment process to build on the existing LCFS regulatory framework and adopt the free allocation methodology described above for producers of multiple transportation fuels.

¹ For the sake of simplicity, the examples in Tables 1 and 2 above assume 100% conversion of feedstocks to the three listed products. In reality, a small percentage of feedstock yield loss and/or use in producing other co-products (such as renewable LPGs) would be expected and must be accounted for by producers.

Comments on Other Proposed Changes and LCFS Policy

We address below several other issues raised by or otherwise germane to CARB's proposed LCFS amendments.

Credit True Up After Annual Verification

MRL strongly supports the proposed amendment to 17 CCR 95488.10(b), which would authorize the Executive Officer to perform a credit true-up for a fuel pathway that has a lower verified operational CI, as evidenced in its annual fuel pathway report, than the CI for which the fuel pathway was previously approved. We believe this amendment properly rewards producers that invest in emission reduction improvements or are otherwise able to "overcomply" with their registered pathways. In addition, the proposed amendment should encourage producers to conservatively calculate and assign margins of safety to their CI scores during the pathway registration process, since the benefits of overcomplying would be returned to the producer in the credit true-up rather than being lost to the LCFS buffer account (as is the case in the current regulations). We request that CARB make the credit true up provisions effective immediately, meaning that the first opportunity for such true up would occur after the submission of Annual Fuel Pathway reports in March 2025 (for calendar year 2023/2024 data).

Deficit Calculation for Verified CI Exceedance

CARB has proposed amendments to 17 CCR 95486.1(g) that would subject non-provisional pathway holders to a calculated obligation of four times the number of deficits in the event of a verified CI exceedance. MRL agrees with the importance of maintaining compliance with fuel pathways; however, we believe that the proposed amendment as written could be unnecessarily punitive. There are reasonable, no-fault circumstances that may trigger a CI exceedance in a given fuel pathway reporting year (e.g., an unexpected asset or facility outage; feedstock supply disruptions leading to sourcing from more distant locations; undetected meter reading errors; etc.). We recognize that the proposed credit true-up language described above should incentivize conservative calculations and margins of safety, but the possibility of CI exceedance still exists even with these safeguards. If the "four times penalty" is included in the final amendments, we request that CARB adopt an additional condition that the penalty would not apply if, in the year following the exceedance, the fuel pathway holder is able to both fully comply with its registered CI *and* make up the difference in the exceedance based on the reported CI score in its annual fuel pathway report. This approach would be very similar to the "deficit carryover" concept that exists under the current U.S. Renewable Fuel Standard program, wherein an obligated party would not be penalized for falling short of its renewable volume obligations in year 1 as long as such shortfall and all other obligations are met in year 2. We believe this would be a reasonable compromise to help avoid triggering a punishment for what may be an atypical (and in many cases unpreventable) CI exceedance in a given year.

Sustainability Requirements for Crop-Based Feedstocks

CARB has proposed amendments at 17 CCR 95488.9(g) that would impose new sustainability obligations for crop-based feedstocks. MRL is supportive of sustainable production. We ask that CARB provide specific examples of existing third party certification systems, if any, that would satisfy the prescribed criteria proposed in Section 95488.9(g)(1)(B). We also believe that CARB should engage in a collaborative process with all stakeholders in the development and approval of consensus-based sustainability certification systems, and should tie the effective date of these new requirements to the adoption of these consensus standards.

To facilitate a smooth transition to the new sustainability obligations, we urge CARB to consider nation-level exemptions or to at least temporarily delay the effective date of these requirements for crop-based feedstocks originating in the U.S. and Canada. Such nation-level exemptions are common concepts that have been embraced under the U.S. Renewable Fuel Standard and Canadian Clean Fuels Regulation. U.S. and Canadian crops do not raise the same degree of sustainability concerns that undoubtedly have motivated the proposed new requirements. For these reasons, we believe nation-level exemption or implementation delays for U.S. and Canadian crops would be a reasonable addition to the sustainability amendments if finalized.

Changes to Annual Standards, Near-Term Step Down, and Automatic Acceleration Mechanism

CARB has proposed a variety of changes aimed at increasing the stringency of the program and, correspondingly, the demand for LCFS credits. These changes are a reflection of the overwhelming success of the program in incentivizing low carbon fuel production and consumption in California to-date. We note, however, that the proposed 5% reduction in the CI benchmarks in 2025 (referred to as the “near-term step down”) could have unintended consequences for existing renewable fuel producers. Each of the aforementioned measures attempt to head off a growing credit surplus that could stifle prices and deter future investments. If credit prices do not rise at the speed or to the degree CARB forecasts in its rulemaking analysis, the near-term step down could end up doing more harm than good for existing producers; credit generation would be curtailed by the sharp decline in the 2025 benchmark without a corresponding rise in prices to help offset these losses. We ask CARB to carefully consider the credit availability and pricing analyses of other stakeholders in their comments in evaluating the necessity of the near-term step down versus a more gradual approach to achieving the proposed 30% CI reduction target by 2030. CARB should also consider whether de-coupling the proposed CI benchmarks for diesel substitutes and fossil jet fuel substitutes, allowing the latter to progress at a slower pace, would more appropriately reflect the current state of the industry and afford greater credit generation potential (and incentivizes) for SAF produced from existing feedstocks and production technologies.

Streamlining Verification Requirements

MRL is currently or expects to soon be subject to annual verification or audit obligations under LCFS or LCFS-like programs in the states/provinces of California, Oregon, Washington, British Columbia, and Alberta, as well as the U.S. Renewable Fuel Standard, the Canadian Clean Fuels Regulation and the ISCC. We recognize and support the need for independent review to facilitate regulatory oversight and market confidence in the validity of emission reductions represented by credits. We ask CARB simply to consider where there may be opportunities to reduce redundancies and streamline verification obligations for consistency with equivalent programs, and to remain open to alignment on these requirements in the future.

* * *

Public Comments of Montana Renewables, LLC
California LCFS Amendments
February 20, 2024

Thank you for considering these comments. We look forward to working collaboratively with CARB throughout this rulemaking process. Please do not hesitate to contact us with any questions.

Regards,

A handwritten signature in black ink that reads "Greg Staiti". The script is cursive and fluid, with the first letters of each word being capitalized and prominent.

Greg Staiti
Compliance Director, MRL



May 10, 2024

Submitted via [CARB portal](#)

Subject: Proposed Amendments to the Low Carbon Fuel Standard Regulation

Dear Executive Officer Steven Cliff,

The Resource Recovery Coalition of California (RRCC) appreciates the opportunity to provide comments on the proposed amendments to the LCFS regulation. RRCC represents essential waste service providers that offer hauling, recycling, and composting services throughout California. Several of our members have invested in anaerobic digestion facilities to divert organic waste from landfills and produce renewable energy. Nearly all our members utilize low carbon fuels to fuel their solid waste collection vehicles.

144.2

We are writing today regarding the avoided methane crediting changes proposed in the LCFS regulation. We, along with many other stakeholders, also support more stringent interim CI reductions and a 2030 target to boost LCFS credit prices and achieve greater emissions reductions.

144.1

As currently drafted, the proposed credit phaseout for avoided methane emissions will put in-state producers of low carbon fuels derived from diverted organic waste at a severe disadvantage, as California is the only state with a 75% diversion goal for organic waste. Importantly, this is a statewide goal, not a local requirement. In other words, California communities are not obligated to reduce their organic waste by 75%, rather they are obligated to provide organic waste collection service to all customers. Moreover, local jurisdictions have optionality in how they manage organic waste outside the landfill and are not required to produce low carbon fuels from organic waste. For this reason, we support the continuation of avoided methane emissions credits for California projects that convert diverted organic waste to produce low carbon fuels.

Should California projects not receive avoided methane emission credits, they will be severely disadvantaged by the proposed approach. Out-of-state projects without the same organic waste diversion goals will continue to receive credit for avoided methane emissions, while in-state projects will not. This is in direct conflict with the goals of SB 1383, and could seriously impair our ability to build out the necessary infrastructure to manage diverted organic waste. Currently, we are far behind the 75% organic waste diversion goal, and the proposed language will only serve to exacerbate this issue and slow down a critical opportunity to reduce methane emissions in California. Instead, we need to adopt policies and incentives to increase the in-state production of biogas and biomethane. We strongly urge CARB to not discontinue credit for



RESOURCE RECOVERY
COALITION OF CALIFORNIA

144.1 avoided methane emissions based on “targets” for landfill diversion that are not binding legal
Cont. requirements.

Importantly, CARB should also be working to identify and develop new markets for biomethane, as committed to in the Advanced Clean Fleets resolution. These efforts are critical to California’s short-lived climate pollutant reduction goals.

We thank CARB for all of your hard work in helping California to clean up our air and help mitigate climate change. Please do not hesitate to reach out with any questions.

Sincerely,

Veronica Pardo

Executive Director

veronica@resourcecoalition.org



May 10, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: ChargePoint Comments on Proposed Verification of EV Charging Under the LCFS

Thank you for the opportunity to submit comments on the proposed amendments to the Low Carbon Fuel Standard (LCFS) issued on December 19, 2023 and expanded upon in the April 10 workshop.

About ChargePoint

Since 2007, ChargePoint has been committed to making it easy for businesses and drivers to go electric with one of the largest electric vehicle (EV) charging networks and a comprehensive portfolio of charging solutions. ChargePoint's cloud subscription platform and software defined charging hardware is designed internally and includes options for every charging scenario from home and multifamily to workplace, parking, hospitality, retail, corridor, and fleets of all kinds.

Summary of comments

- 145.1 • CARB should leverage the existing CTEP certification program and Division of Measurement Standards (DMS) regulations for EVSE under the LCFS verification program to establish and ensure EVSE accuracy. The accuracy and load test tolerance requirements under CTEP are more stringent than MRR and these are well established industry standards that the EVSE industry is already moving towards.
- 145.2 • Verifying the accuracy of an EV charging station and embedded meter (together henceforth referred to as "EVSE") based on that EVSE's use case (i.e., whether that EVSE financially charges for charging or not) will unnecessarily penalize EVSE that do not financially charge for charging because internal meters, as defined by the Mandatory Greenhouse Gas Regulation (MRR), face additional calibration requirements which will add significant cost. The accuracy of EVSE does not depend on whether or not that EVSE financially charges for charging.
- 145.3 • The calibration requirements, as proposed by MRR for EVSE deemed as "internal meters", are problematic for tens of thousands of EVSE across California. ChargePoint's EVSE meters themselves are sealed and unalterable once they leave the factory, rendering them impossible (and unnecessary) to calibrate in the field. If CARB moves forward with the proposed calibration requirements, it may result in the disqualification of tens of thousands of EV charging stations from the LCFS program and/or levy significant new administrative cost on the industry, quite possibly to the point where reporting entities drop out of the program altogether.



Verification of EV Charging Stations, Assumed Meter Accuracy, and Calibration

If CARB believes that on-road electricity reports must undergo third-party verification under the amended regulation due to largescale risk of misreporting, CARB should lean on existing standards and regulations when designing verification so as not to “reinvent the wheel”. The charging industry has worked hard over the years with various federal and state (including California) standards-setting bodies and agencies to come together around an industry standard governing meter accuracy and consumer protection that is robust, effective, and scalable.

There is an existing framework to assess and verify EV charger accuracy established in California. The Division of Measurement Standards (DMS) under the California Department of Food and Agriculture enforces the accuracy of commercial weighing and measuring devices. Since 2019, DMS regulations have adopted sections of the National Institute of Standards and Technology (NIST) Handbook 44, which specifies the accuracy requirements, testing procedures, and other specifications that charging equipment must meet to be used for a commercial purpose in California.¹ These standards are codified in the California Code of Regulations (CCR) under Title 4, Division 9.²

145.4 DMS requires that chargers used for a commercial purpose receive California Type Evaluation Program (CTEP) certification. CTEP is essentially certification that an EVSE make and model has demonstrated the specifications established by NIST Handbook 44 and adopted by DMS. CTEP mandates Accuracy Class 2.0 for alternating current (AC) Level 2 charging, and Accuracy Class 5.0 for direct current fast charging (DCFC). Class 2.0 means an accuracy threshold of +/- 1% off the manufacturing line and 2% in the field; Class 5.0 means an accuracy threshold of 2.5% off the manufacturing line and 5% in the field. CTEP also requires accuracy testing at various loads (referred to as “load test tolerances”). *Note that these accuracy requirements are stricter than those listed in MRR (+/- 5%) thus would result in more accurate reporting under the LCFS, if adopted.* ChargePoint is proud of our leadership to be one of the first manufacturers to receive CTEP certification in California.

CARB’s proposal to draw on the MRR regulations to define how EVSE meters must be verified ignores this work and does not acknowledge the differences between EV charging and conventional liquid and gaseous fueling. First, there are many use cases in EV charging where the EVSE operator does not financially charge for charging. Common use cases include multifamily charging, where property owners/developers will offer free EV charging to tenants as an added benefit, and dedicated fleet charging. Fleets typically don’t charge their own drivers to charge their vehicles since the infrastructure and vehicles are typically owned and operated by the same entity (and the drivers are employed by that same entity).

¹ NIST Handbook 44 establishes the standards for Electric Vehicle Fueling Systems in Section 3.40. Handbook 44 is available at: <https://www.nist.gov/publications/specifications-tolerances-and-other-technical-requirements-weighing-and-measuring-15>

² A summary of the DMS regulations related to EVSE is available at: https://www.cdfa.ca.gov/dms/pdfs/CA_EVSE_Regulation_Reference_Document.pdf



Retail charging is another common example whereby retail store owners may offer customers free charging to encourage more customers to visit their stores. Under CARB's current verification proposal, these EVSE would be treated as internal meters which must meet additional calibration requirements to participate in the LCFS program. Which brings us to the second critical difference between EV charging meters and conventional liquid and gaseous fuel meters.

The MRR regulations require that internal meters are calibrated on a regular basis, which may be at the manufacturers' recommended frequency but regardless must happen at least every five years. This requirement presents a significant challenge for charging devices that do not qualify as financial transaction meters, such as fleet chargers or chargers dispensing electricity for free, because many charging stations models are not able to be calibrated.

ChargePoint, a manufacturer of EV charging station hardware and software, calibrates each device's meter in the factory. Calibration is achieved using special firmware on the device, which is deleted entirely from the device after calibration is complete. This process is done such that the embedded meters used in ChargePoint devices are unalterable. This approach is consistent with NIST Handbook 44 and DMS regulations, which does not set specifications for charging stations to be recalibrated. While ChargePoint cannot speak to the manufacturing processes of other EVSE manufacturers, it is our understanding that it is relatively common across the industry for devices not to allow for calibration or alterability in the field. This is a strategy both to reduce the cost of charger maintenance and to prevent tampering. While the regulations and standards governing EVSE device accuracy are relatively nascent, we are confident that our process results in accurate devices. This process for calibration and accuracy is consistently applied to all ChargePoint products regardless of whether the charger is used to facilitate financial transactions or not.

- 145.5 ChargePoint is concerned that the requirement for internal meters to be calibrated sets an impossible standard for many devices that will be classified as "internal meters" by the MRR regulation to meet. We believe the negative impact of trying to squeeze charging stations into the existing MRR framework will be significant on business and customers, especially fleet chargers. We also expect that if unaddressed, this issue will create implementation difficulty for CARB and/or third-party verifiers, which may lead to a significant disruption in the LCFS program.

If CARB implements the verification rules as proposed that reference MRR, this could result in the disqualification of tens of thousands of EV charging stations from the LCFS program and/or significant additional verification costs on the industry.

ChargePoint Proposal

- 145.6 In addition to allowing reporting entities to prove accuracy via meeting the definition of a 'financial' meter or an 'internal' meter under MRR, CARB should allow reporting entities to



- 145.6 demonstrate accuracy of EVSE via CTEP certification. As detailed above, CTEP's accuracy
Cont. and load test tolerance requirements are more stringent than MRR and therefore would ensure accurate reporting under the LCFS (even more accurate than CARB is currently requiring under MRR). Additionally, for reasons stated above, the EV charging industry is
- 145.7 already galvanizing around CTEP so were CARB to leverage CTEP certification under the LCFS it would lower administrative costs on the industry. The CTEP certification is based on NIST Handbook 44, so CARB should accept CTEP as it provides NIST-level assurance that the EVSE meter is accurate.

- The use case of the charging station (financial meter vs internal meter, as defined under MRR) does not impact meter accuracy. EVSE OEMs sell the same EVSE make/model into
- 145.8 multiple use cases, so verifying meter accuracy based on the use case does not make sense. By demonstrating that an EVSE make/model has achieved CTEP certification ensures that that EVSE is technically accurate, which is what matters most for accuracy. To be clear, for EVSE make/models that are not CTEP certified, our proposal is not that these make/models would be ineligible under the LCFS; the reporting entities may still verify accuracy via the 'financial' or 'internal' meter frameworks.

Conclusion

ChargePoint would welcome the opportunity to meet with the CARB team to further discuss this issue or provide additional written comments/clarifications as needed. We urge the CARB team to consider the importance of designing an LCFS verification scheme that is workable for the charging industry: in 2023, there have been nearly 1.5 million credits issued for non-residential EV charging under the program, and this number is rapidly increasing. If verification is not feasible for the industry, it could strand a significant % of these credits and hamstring the industry going forward at a time when this segment is critical to achieving California's long-term decarbonization goals.

Respectfully,

Evan Neyland
Senior Manager, Carbon Markets

May 10, 2024
California Air Resources Board
1001 I Street
Sacramento, CA 95814
Via electronic submission

Re: April 10 Low Carbon Fuel Standard Workshop

The Iowa Soybean Association appreciates the opportunity to provide additional comments in response to the April 10 Low Carbon Fuel Standard (LCFS) workshop. It was a welcome opportunity to join staff and stakeholders for the in-person workshop. We encourage CARB to continue providing opportunities for in-person interaction.

The Iowa Soybean Association represents Iowa's over 40,000 soybean farmers. The Iowa Soybean Association is a grower driven organization with a vision to advance the long-term competitiveness of Iowa soybean farmers by delivering those farmers opportunities to thrive. This includes delivery of programs to increase the productivity and sustainability of thousands of Iowa farms while helping to build markets domestically and globally. We are committed to delivering improved productivity, profitability and sustainability of the Iowa soybean cropping system.

Iowa is the number two producer of soybeans in the United States and supports the nation's largest fleet of biodiesel plants at an annualized capacity of approximately 400 million gallons a year. Iowa is also home to a large share of the country's soybean processing industry capable of crushing approximately 1.6 million bushels of soybeans per day.

As CARB seeks to revise the provisions in the Initial Statement of Reasons (ISOR) and draft regulation, Iowa Soybean Association would like to highlight three remaining areas of concern for CARB Staff:

1. Proposed Crop-Based Biofuel Sustainability Guardrails
2. Indirect Land Use Change
3. Waste-based Feedstock Carbon Intensity Methodology

Sustainability Guardrails: Exploring Additional Options

Iowa Soybean Association appreciates the extensive analysis staff completed regarding the use of renewable diesel and biodiesel in the LCFS program. We agree with the staff's findings that reducing the usage of biomass-based diesel will likely lead to replacement with fossil diesel, given the elusive nature of heavy-duty zero-emission vehicles. Additionally, we agree with staff that if additional guardrails are deemed necessary by the board, a flat cap on a broad category of feedstock (lipids) is not in the interest of CARB, California citizens, the renewable energy industry, or the freight sector.

However, in its current form we remain opposed to CARB's feedstock certification proposal. As it is currently proposed, the certified feedstock attributes go far beyond the scope of the current and likely long-term trajectory of the program. Not only are many of the proposed certification requirements beyond the scope of calculating carbon intensity, but they are also inappropriate for the U.S. given the numerous local, state, and federal laws American farmers operate under relative to their peers in less developed countries. Again, if additional guardrails are deemed necessary by the board, we implore CARB to consider taking a more risk-based approach which



recognizes farmers operating under the laws of the United States are significantly less likely than those in other parts of the world to engage in farming practices that result in land conversion.

Specifically, we encourage CARB to reconsider what data would be necessary to achieve their goal of “...reduc[ing] the risk that rapid expansion of biofuel production and biofuel feedstock demand could result in deforestation or adverse land use change...” stated in the ISOR released in December of 2023.¹ It is our belief that data required to meet the narrow goal stated in the ISOR is as simple as existing field boundaries. This data American farmers submit annually to the federal government to certify their crops and acres to be eligible to enroll in numerous USDA programs. Rather than create a new, costly, and burdensome system of verification, we encourage CARB to utilize existing, high-quality, low-cost federal government data through a data sharing agreement.

When CARB staff make the decision to finally allow farmers to participate more fully in the LCFS, such as through a climate smart agricultural system, then it may be appropriate to collect some of the additional data points contemplated in the draft regulation to validate unique carbon intensity scores.

Updating Modeling for Soy Oil Feedstocks

Iowa Soybean Association remains concerned with CARB’s protracted use of outdated Indirect Land Use Change (iLUC) modeling runs. With the current penalty in place, soy-based feedstocks will be phased out of the LCFS in less than a decade, potentially sooner depending on the auto acceleration mechanism. This is highly concerning because on the one hand CARB is recommending stringent sustainability guardrails for U.S. soy, but on the other hand is still on track to phase-out soy-based biofuels from credit generation by approximately 2035 or sooner.

Staff mentioned in their presentation the desire to evaluate new, regionally specific land use change scores for feedstocks grown in regions that were not previously considered. Iowa Soybean understood that to mean South American oilseeds. We view this as a positive development as South America is likely to continue to expand acreage as part of a large geopolitically driven shift in global soybean sourcing. While we are encouraged to see CARB considering more regionally specific iLUCs, failure to reevaluate North America at the same time would be a lost opportunity and could disadvantage a less risky and more sustainable supply of feedstock.

Recently, the federal government updated their indirect effect assessment for soy-based biofuel as part of the Inflation Reduction Act 40B guidance. This reevaluation saw the total penalty cut from 24.8 kg CO₂e/MMBTU to 17.1 kg CO₂e/MMBTU, a 31% decline. We ask CARB to follow the lead of the federal government and bring their science up to date.

A Fresh Look at So-Called “Waste” Feedstocks

Iowa Soybean Association and the farmers we represent are **highly concerned** with recent large increases in the importation of so-called ‘used cooking oil’ of Asian origin. Following the very high-profile fraud in Europe surrounding cooking oil of the same origin, we strongly encourage CARB to continue on their path of increasing audit stringency and oversight for feedstocks at high-risk of adultery or misclassifications. The value of maintaining market integrity cannot be understated.

Finally, we encourage CARB to take a fresh look at their LCA methodology for these so-called ‘waste’ based feedstocks. While these oils may have at one time been a waste under the ISO 14001 definition, it is hard to argue they remain a waste given their elevated value. CARB recognized in previous rulemakings that feedstocks like corn

¹ [Staff Report: Initial Statement of Reasons \(ca.gov\)](#)

oil were not a waste, but a highly valuable co-product. As such CARB expanded the system boundary of this feedstock. Given the increased and sustained value of feedstocks like used cooking oil and animal fats we encourage CARB to consider an expansion of the system boundary of these feedstocks, just as staff is considering for manure-based renewable natural gas.

A Critical Need for Stakeholder Engagement

Any agricultural sustainability criteria that CARB establishes will have significant impacts on how the soy industry and biofuels value chain operates. We believe the current proposal should continue to be discussed and workshopped before adoption. In fact, CARB has spent more time openly contemplating new potential regulations which were not included in this package, such as climate smart ag, than they did opening discussing the proposed sustainability certification. A change of this magnitude needs significantly more dialogue with the agricultural community and especially those involved in the monitoring, reporting, and verification aspects of climate smart agriculture.

146.5

We encourage CARB to convene a working group that includes farmers, climate smart commodity companies, elevators, and soybean processors to help develop any crop-specific sustainability provisions. This working group should endeavor to flesh out workable sustainability guardrail provisions that CARB can implement by the second quarter of 2025. This would ensure that CARB develops a solution that does not unintentionally limit sustainable lipid-based feedstocks through onerous reporting requirements, while allowing CARB to continue to focus on implementation of the rest of the LCFS update by the end of 2024.

Conclusion

Iowa Soybean Association remains encouraged by the continued successes of the LCFS and the diverse low-carbon fuel market it is creating. California's LCFS creates demand for cleaner fuel which leads to healthier outcomes for Californian's and in turn this policy is supporting revitalization of rural economies across Iowa and the broader heartland. However, it is critical that CARB finalizes regulatory updates in a way that does not arbitrarily exclude agricultural feedstocks, create unnecessary onerous certification requirements, or inadvertently place additional scrutiny on lower-risk feedstock while accidentally turning a blind high to much higher risk activity abroad.

The Iowa Soybean Association is eager to continue working with CARB to support the role of agriculture in diversifying the fuel supply and supporting cleaner fuel options in California and beyond. On behalf of Iowa soybean farmers, we appreciate the opportunity to comment and look forward to collaborating with CARB and other relevant stakeholders on implementation of policies that expand the use of soy-based biofuels and market opportunities for soybean farmers.

Sincerely,

Matt Herman
Chief Officer, Advocacy and Demand
Iowa Soybean Association



May 10, 2024

Honorable Chair Liane Randolph and Honorable Board Members
Low Carbon Fuel Standard Program
California Air Resources Board
1001 I St., Sacramento, CA 95814

Sent via email to LCFSworkshop@arb.ca.gov

Re: April 10th California Low Carbon Fuel Standard (LCFS) Workshop

Chair Randolph and Members of the Board:

EVgo appreciates the opportunity to comment on the California Air Resources Board's (CARB) workshop on the Low Carbon Fuel Standard (LCFS) held on April 10, 2024. Headquartered in Los Angeles, EVgo is one of the nation's largest public fast charging providers for electric vehicles (EVs) with a mission to expedite the mass adoption of EVs by creating a convenient, reliable, and affordable EV charging network that delivers fast charging to all drivers.

147.1

The LCFS is one of California's most effective decarbonization tools. It supports critical investments in EV charging infrastructure needed to meet Advanced Clean Cars (ACC) II and other CARB zero-emission vehicle (ZEV) regulations. Unlike other California policies that incentivize EV charger deployment through one-time capex support, the LCFS provides critical ongoing support for EV charger operations, including maintenance, in a manner that enhances the EV charging experience for all drivers. EVgo appreciates all the effort CARB has made to improve the LCFS to-date, and it is imperative that CARB further strengthen the LCFS in this rulemaking to further accelerate ZEV adoption.

EVgo's comments are summarized as follows:

147.2

1. Adopt at least a 9% carbon intensity (CI) step down in 2025 to accelerate investment in ZEV infrastructure;

147.3

2. Allow the Auto Adjustment Mechanism (AAM) to be triggered in 2026 with an effective date of 2027 to strengthen guardrails on the LCFS; and

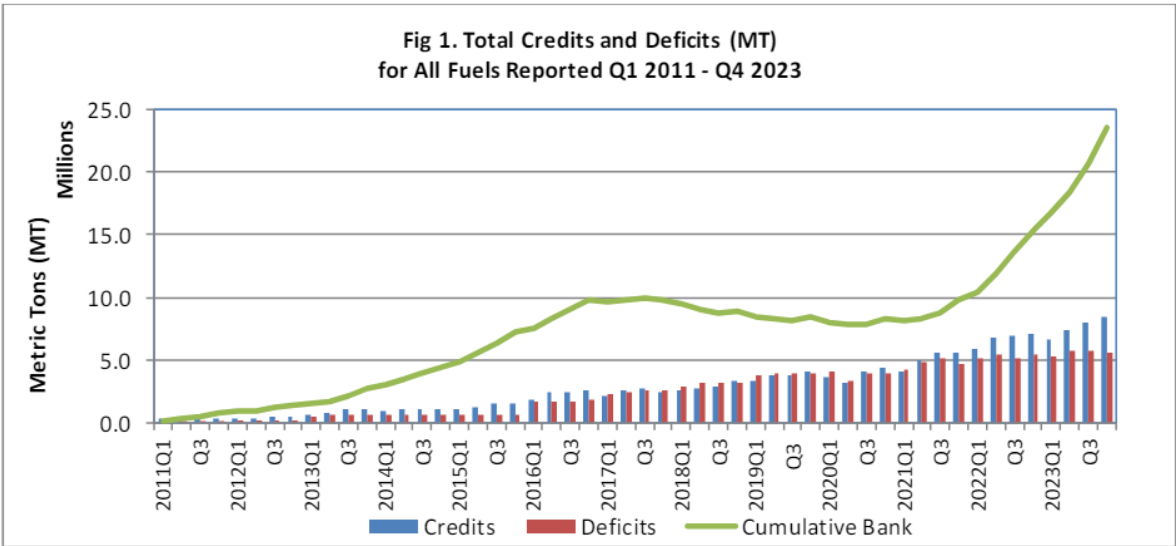
147.4

3. Permit EV charging network providers that have received California Type Evaluation Program (CTEP) certification from the CDFA Division of Measurement Standards to be eligible for less intensive verification requirements as defined in §95481 of the regulation

147.2
cont.

1. Adopt at least a 9% Carbon Intensity (CI) step down in 2025 to accelerate investment in ZEV infrastructure

During the April 10th workshop, CARB Staff presented new modeling scenarios that increased the stringency of the 2025 CI stepdown from 5% to 7-9%. EVgo appreciates Staff’s exploration of a deeper 2025 CI step down and supports at least a 9% step down to further bolster private investment in ZEV infrastructure needed to meet California’s climate and energy policy goals. Many commenters on the Initial Statement of Reasons (ISOR), including CalETC and the Electric Vehicle Charging Association (EVCA)¹, AJW², Bridge to Renewables (BTR) and General Motors (GM)³, Tesla⁴, and ICF⁵ support and recognize the need for increased CI stringency to address the continued imbalance in the LCFS credit market. As seen in Figure 1 below, CARB’s most recent quarterly data summary for Q4 2023 illustrates that the LCFS credit bank continues to grow at an accelerated pace, with a cumulative bank that has exceeded 23 million credits.⁶ Increasing the stringency of near-term CI targets is vital for correcting program overperformance and providing greater stability to the credit bank to ensure that the program functions as intended: to encourage the growth of low carbon fuels. EVgo encourages CARB to update the proposed LCFS regulation to include a 9% step down in 2025 and drive further progress on transportation decarbonization.



¹ <https://www.arb.ca.gov/lists/com-attach/6859-lcfs2024-VDEAcFAyWGoKIQVvm.pdf>

² <https://www.arb.ca.gov/lists/com-attach/6795-lcfs2024-BTdVZwAxBGUDNwk5.pdf>

³ <https://www.arb.ca.gov/lists/com-attach/6935-lcfs2024-UTIBZlQnWGkGX1c0.pdf>

⁴ <https://www.arb.ca.gov/lists/com-attach/7042-lcfs2024-AjBdb1VkJvcLP1Rk.pdf>

⁵ <https://www.arb.ca.gov/lists/com-attach/7078-lcfs2024-VDVcNfLyVGsLdFQu.pdf>

⁶

<https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/dashboard/quarterlysummary/Q4%202023%20Data%20Summary.pdf>

2. Allow the Auto Adjustment Mechanism (AAM) to be triggered in 2026 with an effective date of 2027 to strengthen guardrails on the LCFS

147.3
cont.

In response to CARB staff's request for feedback on modifications to the AAM, EVgo maintains that CARB can further support the ambition of California's decarbonization goals by allowing the AAM to be triggered in 2026 with a potential earliest effective date in 2027 as opposed to the currently proposed 2027 trigger year and effective date in 2028. As mentioned in AJW's comments on the Initial Statement of Reasons (ISOR), the AAM is intended to respond to market overperformance in a timely fashion.⁷ Under a scenario where the credit bank continues to grow unabated despite a more robust 2025 CI step down, it is critical that the AAM responds to near-term market conditions and raises the ambition of the LCFS accordingly to spur continued investment in ZEV infrastructure.

EVgo also agrees with AJW's recommendation to revise the average quarterly deficit ratio trigger from 3.0 to 2.0, as this ratio allows the AAM to respond more readily to market overperformance and encourages deeper transportation decarbonization necessary to meet state climate policy goals.⁸ ISOR comments from parties including CalETC and EVCA⁹, BTR and GM¹⁰, Tesla¹¹, and ICF¹² also echo the need to accelerate the implementation of the AAM and modify the average quarterly deficit trigger ratio. A 9% CI step down in 2025 and a strengthened AAM serve as important complements to recalibrate the LCFS and EVgo encourages CARB to take these near-term steps to enhance the program's performance.

3. Permit EV charging network providers that have received California Type Evaluation Program (CTEP) certification from the CDFA Division of Measurement Standards to be eligible for less intensive verification requirements as defined in §95481 of the regulation

147.4
cont.

EVgo supports timely, accurate reporting of dispensed fuel in the LCFS. To support more efficient LCFS compliance procedures, EVgo recommends that charging network providers with EV chargers that are CTEP-certified by CDFA be eligible for less intensive verification requirements. CDFA's Division of Measurement Standards is the lead state government body associated with testing and validating the accuracy of EV chargers and already has regulations in place to support accurate measurement of electric fuels. Specifically, DMS adopted regulations in January 2020 that require commercially available EV chargers to meet stringent accuracy standards – as well as other consumer protection requirements in the CTEP – which

⁷ <https://www.arb.ca.gov/lists/com-attach/6795-lcfs2024-BTdVZwAxBGUDNwk5.pdf>

⁸ *Id.*

⁹ <https://www.arb.ca.gov/lists/com-attach/6859-lcfs2024-VDEAcFAyWGoKIQVvm.pdf>

¹⁰ <https://www.arb.ca.gov/lists/com-attach/6935-lcfs2024-UTIBZlQnWGkGX1c0.pdf>

¹¹ <https://www.arb.ca.gov/lists/com-attach/7042-lcfs2024-AjBdb1VkVjcLP1Rk.pdf>

¹² <https://www.arb.ca.gov/lists/com-attach/7022-lcfs2024-UWMAMlVkUTAKPQk9.pdf>

147.4
cont.

conform to the National Institute of Standards and Technology Handbook 44 technical standards for charging equipment.¹³ These requirements, which include a +/- 5% maintenance tolerance for DC electricity as vehicle fuel, are aligned with CARB's proposed §95491.2(a)(1)(B) which would require all meters to achieve accuracy levels of +/- 5%.¹⁴ Furthermore, county weights & measures officials are responsible for enforcing compliance with these regulations by testing EV chargers in the field; if a charger is not performing within the accuracy tolerances prescribed by DMS regulation, counties can require a charger to enter maintenance until the charger's accuracy tolerance is corrected.¹⁵ Finally, EV charging providers already support continued implementation and enforcement of weights & measures regulations by paying annual device registration fees to counties where the devices are in operation.¹⁶

CARB's proposed verification requirements for non-residential EV charging duplicate existing CDFA EV charging accuracy regulations and would materially raise the cost of program participation for EV charging providers at a time when charger deployment must scale rapidly to meet state goals. Similarly, EV charging providers have already gone through great lengths to meet the accuracy requirements mandated by CDFA. Comments from stakeholders including CalETC and EVCA¹⁷, Sacramento Municipal Utility District¹⁸, BMW Group of North America¹⁹, ChargePoint²⁰, and Tesla²¹ reinforce the need to reconsider proposed verification requirements considering CDFA's existing regulatory authority and the costs imposed by site visit requirements across thousands of charging locations. At a minimum, EVgo encourages CARB to permit EV charging network providers that have received California Type Evaluation Program (CTEP) certification from the CDFA Division of Measurement Standards to be eligible for less intensive verification requirements as defined in §95481 of the regulation.²²

Conclusion

EVgo appreciates CARB's leadership in refining the LCFS in a manner consistent with California's nation-leading decarbonization goals. A robust LCFS underpins the success of the state's near-term ZEV targets, and strengthening the program will amplify the widespread benefits such as

¹³

[https://govt.westlaw.com/calregs/Document/IA5650EF3543B11ECAE2D000D3A7C4BC3?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=\(sc.Default\)](https://govt.westlaw.com/calregs/Document/IA5650EF3543B11ECAE2D000D3A7C4BC3?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default))

¹⁴

[https://govt.westlaw.com/calregs/Document/IA5650EF3543B11ECAE2D000D3A7C4BC3?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=\(sc.Default\)](https://govt.westlaw.com/calregs/Document/IA5650EF3543B11ECAE2D000D3A7C4BC3?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default))

¹⁵ https://www.cdfa.ca.gov/dms/docs/publications/2023/2023_Combined_BPC.pdf

¹⁶ *Id.*

¹⁷ <https://www.arb.ca.gov/lists/com-attach/6859-lcfs2024-VDEAcFAyWGoKIQVm.pdf>

¹⁸ <https://www.arb.ca.gov/lists/com-attach/6970-lcfs2024-AXJROgRwBTIKU1Ix.pdf>

¹⁹ <https://www.arb.ca.gov/lists/com-attach/6966-lcfs2024-AGJSOQZwU25QNwFe.pdf>

²⁰ <https://www.arb.ca.gov/lists/com-attach/6899-lcfs2024-VzQHaQFhV3YKawJn.pdf>

²¹ <https://www.arb.ca.gov/lists/com-attach/7042-lcfs2024-AjBdb1VkVjcLP1Rk.pdf>

²² https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/lcfs_appa1.pdf

cleaner air that transportation electrification provides to all Californians. EVgo looks forward to coordinating with CARB and other stakeholders to complete the LCFS rulemaking process with program changes taking effect in January 2025.

Respectfully submitted this 10th Day of May,

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May 10, 2024

Hon. Liane M. Randolph, Chair
California Air Resources Board
1001 I Street
Sacramento, California 95814

Re: Proposed Low Carbon Fuel Standard Amendments

Dear Chair Randolph:

Thank you for the opportunity to comment in response to the April 10, 2024 Public Workshop that the California Air Resources Board ("CARB") held to discuss the proposed Low Carbon Fuel Standard ("LCFS") amendments.

148.1 Bunge supports the comments submitted by the National Oilseed Processors Association ("NOPA"); NOPA is the leading industry group for the oilseed processing sector, and Bunge supports the positions NOPA has expressed to CARB in its submission to CARB. In addition, Bunge writes to share four recommendations to improve the proposed sustainability certification requirement for crop-based fuels and address CARB's land-use change concerns. 148.2 First, CARB should adopt a risk-based approach to sustainability certifications. Second, CARB 148.3 should not require segregation of certified and uncertified feedstocks. Third, a mass balance 148.4 approach to chain of custody should be accepted. And fourth, the compliance timeline should 148.5 be extended. Each recommendation is discussed in more detail in Part II.

I. Background

Bunge is the world's largest oilseed processor by crush volume capacity. Bunge buys and processes agricultural commodities, turning them into products used in the food industry, animal feed, and the renewable diesel industry. Bunge is also an industry leader in sustainability, embracing climate-focused decision making and setting ambitious goals. For instance, we are well on our way to meeting our commitment to eliminate deforestation and native vegetation conversion from our supply chain in 2025. We are also helping accelerate industry-wide progress through sector initiatives that seek to create common alignment and scalability on deforestation goals. Bunge's robust traceability and monitoring systems give us unprecedented insight into our supply chain. We achieved 97.7 percent traceability in our indirect supply of soy in Brazil's high-risk areas in 2023. Further, we have already achieved 100 percent traceability in our direct supply of soy in priority areas in South America. We are leveraging our experience working with farmers and incentivizing sustainable practices using technology and data to scale

our efforts across the wider agribusiness sector in many geographies where deforestation is a higher risk.

Bunge supports the LCFS, and we are proud of the role that we have played in the program's success. CARB's implementation of the LCFS has increased volumes of low-carbon fuels—including the biofuels that Bunge helps produce through supplying oilseed feedstocks to biofuel producers—such that California's overall petroleum fuel use has fallen by 1.3 billion gallons since 2019. Meanwhile, the carbon intensity ("CI") of the state's transportation fuels has declined 12.63 percent from 2010 levels.

148.6 With the LCFS's success in mind, we supported CARB's decision to reject an arbitrary cap on crop-based fuels in the December 2023 45-day package, as we expressed in our February 2024 comment letter. At the public workshop in April 2024, we were encouraged to hear CARB staff recognize that a cap would encourage continued fossil fuel use and conflict with CARB's mandate as a public health and environmental agency. An arbitrary cap on crop-based fuels would also undermine the science-based approach that is fundamental to the LCFS's success.

II. Four Recommendations to Improve CARB's Sustainability Certification Proposal

148.7 As a leader in renewable fuel feedstocks and sustainable practices, Bunge is concerned about aspects of CARB's proposed requirement that crop- and forestry-based feedstocks "maintain continuous third-party sustainability certification" to demonstrate they were not "sourced on land that was forested after January 1, 2008." See Proposed Regulation Order at § 95488.9(g).

We have expressed our concerns while meeting with CARB staff and in our February 2024 comment letter on the 45-day package. We follow up in today's comments with more detail on four specific recommendations that would address our concerns and achieve CARB's goals.

A. A Risk-Based Approach Should Be Adopted

148.2
cont. We recommend that CARB adopt a risk-based approach to sustainability, which would tailor measures to regions based on the real-world deforestation risk in specific geographies.

Bunge has substantial experience implementing sustainability certifications to meet our voluntary commitments and comply with the European Union's Renewable Energy Directive ("RED"). For example, Bunge has certified products using systems from the Round Table on Responsible Soy ("RTRS"), Biomass Biofuel Sustainability Voluntary Scheme ("2BSvs"), and International Sustainability and Carbon Certification ("ISCC").

Our experience with these certifications confirms that required traceability and monitoring can be important tools in certain environments. Our approach focuses on addressing areas where the risk of land-use change is highest, such as South America. In keeping with this approach, our traceability and monitoring systems track soy to the farm level in the Gran Chaco in Argentina

and Paraguay and the Cerrado in Brazil. Full traceability in these contexts is a logical solution, and one commensurate with the identified risk of deforestation. Bunge views certification schemes, such as ISCC RED, as appropriate and useful in these high-risk environments.

148.2
cont. However, agricultural expansion pressure is far lower in the United States and Canada. In fact, U.S. farmers today produce higher crop volumes on the same amount of land (or slightly less) than 40 years ago, according to U.S. Department of Agriculture data. In this context, implementing a full-traceability system like ISCC RED would be a complicated endeavor with little upside. Certifications devised for high-risk regions are a poor fit for these low-risk growers.

The best solution is a risk-based approach. A risk-based approach would set certification measures for particular regions based on their real-world deforestation risk. Full traceability and monitoring could be implemented in high-risk regions, such as South America. Less onerous approaches would be applied in North America, where experience and data demonstrate that the risk of deforestation is so low that ISCC RED-level certifications would have little benefit. For further details on implementing a risk-based approach, Bunge refers CARB to the NOPA comment letter.

B. Physical Segregation Should Not Be Required

Bunge recommends that CARB make clear in its final regulations that physical feedstock segregation is not required to comply with the LCFS sustainability certification requirements.

148.3
cont. Bunge is concerned that the proposed regulation and its sustainability certifications could require full physical segregation of certified crops from uncertified crops. The U.S. agricultural supply chain is not set up to segregate soy and other commodities in this way. As NOPA notes in its comments, the U.S. grain system operates at a level of complexity not seen in other countries. For instance, more than 300,000 U.S. farmers deliver grain to more than 8,000 storage points in the domestic supply chain. In contrast, most other countries have less elaborate supply chains and fewer delivery points, making segregation far more feasible in those countries. Indeed, segregated supply chains are more common in those countries in part because of those countries' higher deforestation risk. The lower deforestation risk in the United States and Canada is another reason that segregation should not be required in North America.

In sum, requiring full physical segregation of certified crops from uncertified crops in North America would be extremely difficult. Nor would North American segregation achieve the deforestation goals it seeks to accomplish in South America, because deforestation risk is low to nonexistent in North America. We recommend that CARB clarify in its final rule that segregation is not required to satisfy the sustainability certification requirements in the United States and Canada.

C. Mass Balance Should Be Accepted for Chain of Custody

148.4
cont.

We recommend that CARB accept a mass balance approach to chain of custody, rather than requiring full physical segregation.

Mass balance allows entities to track the amount and sustainability characteristics of certified feedstocks through the value chain, and to attribute those characteristics based on verifiable bookkeeping. As explained in Part II.B, segregation would be a huge logistical hurdle in the United States. A mass balance approach to chain of custody would be an effective, commonsense alternative to physical segregation. Moreover, mass balance would accomplish CARB's sustainability goals more practically than segregation. The rigorous ISCC standard accepts a mass balance approach, reinforcing that this approach should also be accepted in the LCFS context. See, e.g., ISCC EU 203 Traceability and Chain of Custody, § 4.4.

Bunge encourages CARB to clarify and confirm that a mass balance approach to chain of custody will be acceptable under the final LCFS regulation.

D. The Compliance Timeline Should Be Extended Beyond 2028

Bunge recommends that CARB extend the sustainability certification implementation timeline beyond 2028 to provide sufficient time for the rules to be implemented among growers in regions like the U.S. and Canada.

148.5
cont.

CARB's proposal requires crop-based feedstocks be certified at the point of origin by January 1, 2028. For a certification system to be approved, it must have been recognized by a government for at least 24 months. In other words, market participants have less than four years to implement certifications, and any certification scheme used must be recognized by a government now or in the very near future due to the 24-month criterion. But today, almost no North American growers have sustainability certifications in place. The initial response from North American growers may be one of skepticism due to the low risk of deforestation in the region, so it may take time to implement a system that growers feel comfortable with. U.S. and Canada compliance will thus be complex.

In light of this U.S. and Canada implementation challenge and the other unresolved concerns addressed in Part II, we encourage CARB to adopt an extended compliance timeline that gives North American growers sufficient time to implement sustainability certifications.

III. Conclusion

Bunge commends CARB's commitment to improving the LCFS in the 2024 amendments, including its decision to maintain a role for low-carbon biofuels.

Bunge has unique insight into sustainability certifications as an industry leader that has implemented these schemes to meet voluntary goals and comply with EU regulations. This first-hand experience means that Bunge appreciates and understands CARB's concerns about land-

use change. It is because we share CARB's concerns that we have committed to eliminate deforestation and native vegetation conversion from our supply chain in 2025. We believe that the recommendations that we have offered in this comment letter can help CARB address its concerns, while avoiding the pitfalls and implementation issues that Bunge has identified.

We appreciate the opportunity to share Bunge's perspective and to advance our common goal of a deforestation-free fuel supply.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert Coviello". The signature is fluid and cursive, with the first name "Robert" and last name "Coviello" clearly distinguishable.

Robert Coviello

Chief Sustainability Officer and Government Affairs



May 10, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: ChargePoint Comments on Proposed Verification of EV Charging Under the LCFS

Thank you for the opportunity to submit comments on the proposed amendments to the Low Carbon Fuel Standard (LCFS) issued on December 19, 2023 and expanded upon in the April 10 workshop.

About ChargePoint

Since 2007, ChargePoint has been committed to making it easy for businesses and drivers to go electric with one of the largest electric vehicle (EV) charging networks and a comprehensive portfolio of charging solutions. ChargePoint's cloud subscription platform and software defined charging hardware is designed internally and includes options for every charging scenario from home and multifamily to workplace, parking, hospitality, retail, corridor, and fleets of all kinds.

Summary of comments

- CARB should leverage the existing CTEP certification program and Division of Measurement Standards (DMS) regulations for EVSE under the LCFS verification program to establish and ensure EVSE accuracy. The accuracy and load test tolerance requirements under CTEP are more stringent than MRR and these are well established industry standards that the EVSE industry is already moving towards.
- Verifying the accuracy of an EV charging station and embedded meter (together henceforth referred to as "EVSE") based on that EVSE's use case (i.e., whether that EVSE financially charges for charging or not) will unnecessarily penalize EVSE that do not financially charge for charging because internal meters, as defined by the Mandatory Greenhouse Gas Regulation (MRR), face additional calibration requirements which will add significant cost. The accuracy of EVSE does not depend on whether or not that EVSE financially charges for charging.
- The calibration requirements, as proposed by MRR for EVSE deemed as "internal meters", are problematic for tens of thousands of EVSE across California. ChargePoint's EVSE meters themselves are sealed and unalterable once they leave the factory, rendering them impossible (and unnecessary) to calibrate in the field. If CARB moves forward with the proposed calibration requirements, it may result in the disqualification of tens of thousands of EV charging stations from the LCFS program and/or levy significant new administrative cost on the industry, quite possibly to the point where reporting entities drop out of the program altogether.



Verification of EV Charging Stations, Assumed Meter Accuracy, and Calibration

If CARB believes that on-road electricity reports must undergo third-party verification under the amended regulation due to largescale risk of misreporting, CARB should lean on existing standards and regulations when designing verification so as not to “reinvent the wheel”. The charging industry has worked hard over the years with various federal and state (including California) standards-setting bodies and agencies to come together around an industry standard governing meter accuracy and consumer protection that is robust, effective, and scalable.

There is an existing framework to assess and verify EV charger accuracy established in California. The Division of Measurement Standards (DMS) under the California Department of Food and Agriculture enforces the accuracy of commercial weighing and measuring devices. Since 2019, DMS regulations have adopted sections of the National Institute of Standards and Technology (NIST) Handbook 44, which specifies the accuracy requirements, testing procedures, and other specifications that charging equipment must meet to be used for a commercial purpose in California.¹ These standards are codified in the California Code of Regulations (CCR) under Title 4, Division 9.²

DMS requires that chargers used for a commercial purpose receive California Type Evaluation Program (CTEP) certification. CTEP is essentially certification that an EVSE make and model has demonstrated the specifications established by NIST Handbook 44 and adopted by DMS. CTEP mandates Accuracy Class 2.0 for alternating current (AC) Level 2 charging, and Accuracy Class 5.0 for direct current fast charging (DCFC). Class 2.0 means an accuracy threshold of +/- 1% off the manufacturing line and 2% in the field; Class 5.0 means an accuracy threshold of 2.5% off the manufacturing line and 5% in the field. CTEP also requires accuracy testing at various loads (referred to as “load test tolerances”). *Note that these accuracy requirements are stricter than those listed in MRR (+/- 5%) thus would result in more accurate reporting under the LCFS, if adopted.* ChargePoint is proud of our leadership to be one of the first manufacturers to receive CTEP certification in California.

CARB’s proposal to draw on the MRR regulations to define how EVSE meters must be verified ignores this work and does not acknowledge the differences between EV charging and conventional liquid and gaseous fueling. First, there are many use cases in EV charging where the EVSE operator does not financially charge for charging. Common use cases include multifamily charging, where property owners/developers will offer free EV charging to tenants as an added benefit, and dedicated fleet charging. Fleets typically don’t charge their own drivers to charge their vehicles since the infrastructure and vehicles are typically owned and operated by the same entity (and the drivers are employed by that same entity).

¹ NIST Handbook 44 establishes the standards for Electric Vehicle Fueling Systems in Section 3.40. Handbook 44 is available at: <https://www.nist.gov/publications/specifications-tolerances-and-other-technical-requirements-weighing-and-measuring-15>

² A summary of the DMS regulations related to EVSE is available at: https://www.cdfa.ca.gov/dms/pdfs/CA_EVSE_Regulation_Reference_Document.pdf



Retail charging is another common example whereby retail store owners may offer customers free charging to encourage more customers to visit their stores. Under CARB's current verification proposal, these EVSE would be treated as internal meters which must meet additional calibration requirements to participate in the LCFS program. Which brings us to the second critical difference between EV charging meters and conventional liquid and gaseous fuel meters.

The MRR regulations require that internal meters are calibrated on a regular basis, which may be at the manufacturers' recommended frequency but regardless must happen at least every five years. This requirement presents a significant challenge for charging devices that do not qualify as financial transaction meters, such as fleet chargers or chargers dispensing electricity for free, because many charging stations models are not able to be calibrated.

ChargePoint, a manufacturer of EV charging station hardware and software, calibrates each device's meter in the factory. Calibration is achieved using special firmware on the device, which is deleted entirely from the device after calibration is complete. This process is done such that the embedded meters used in ChargePoint devices are unalterable. This approach is consistent with NIST Handbook 44 and DMS regulations, which does not set specifications for charging stations to be recalibrated. While ChargePoint cannot speak to the manufacturing processes of other EVSE manufacturers, it is our understanding that it is relatively common across the industry for devices not to allow for calibration or alterability in the field. This is a strategy both to reduce the cost of charger maintenance and to prevent tampering. While the regulations and standards governing EVSE device accuracy are relatively nascent, we are confident that our process results in accurate devices. This process for calibration and accuracy is consistently applied to all ChargePoint products regardless of whether the charger is used to facilitate financial transactions or not.

ChargePoint is concerned that the requirement for internal meters to be calibrated sets an impossible standard for many devices that will be classified as "internal meters" by the MRR regulation to meet. We believe the negative impact of trying to squeeze charging stations into the existing MRR framework will be significant on business and customers, especially fleet chargers. We also expect that if unaddressed, this issue will create implementation difficulty for CARB and/or third-party verifiers, which may lead to a significant disruption in the LCFS program.

If CARB implements the verification rules as proposed that reference MRR, this could result in the disqualification of tens of thousands of EV charging stations from the LCFS program and/or significant additional verification costs on the industry.

ChargePoint Proposal

In addition to allowing reporting entities to prove accuracy via meeting the definition of a 'financial' meter or an 'internal' meter under MRR, CARB should allow reporting entities to



demonstrate accuracy of EVSE via CTEP certification. As detailed above, CTEP's accuracy and load test tolerance requirements are more stringent than MRR and therefore would ensure accurate reporting under the LCFS (even more accurate than CARB is currently requiring under MRR). Additionally, for reasons stated above, the EV charging industry is already galvanizing around CTEP so were CARB to leverage CTEP certification under the LCFS it would lower administrative costs on the industry. The CTEP certification is based on NIST Handbook 44, so CARB should accept CTEP as it provides NIST-level assurance that the EVSE meter is accurate.

The use case of the charging station (financial meter vs internal meter, as defined under MRR) does not impact meter accuracy. EVSE OEMs sell the same EVSE make/model into multiple use cases, so verifying meter accuracy based on the use case does not make sense. By demonstrating that an EVSE make/model has achieved CTEP certification ensures that that EVSE is technically accurate, which is what matters most for accuracy. To be clear, for EVSE make/models that are not CTEP certified, our proposal is not that these make/models would be ineligible under the LCFS; the reporting entities may still verify accuracy via the 'financial' or 'internal' meter frameworks.

Conclusion

ChargePoint would welcome the opportunity to meet with the CARB team to further discuss this issue or provide additional written comments/clarifications as needed. We urge the CARB team to consider the importance of designing an LCFS verification scheme that is workable for the charging industry: in 2023, there have been nearly 1.5 million credits issued for non-residential EV charging under the program, and this number is rapidly increasing. If verification is not feasible for the industry, it could strand a significant % of these credits and hamstring the industry going forward at a time when this segment is critical to achieving California's long-term decarbonization goals.

Respectfully,

Evan Neyland
Senior Manager, Carbon Markets



May 10, 2024

The Honorable Steven S. Cliff
Executive Officer
California Air Resources Board
Sacramento, CA 95814

Re: Proposed Amendments to the Low Carbon Fuel Standard Regulation

Dear Executive Officer Cliff:

I am writing on behalf of the Bioenergy Association of California (BAC) to comment on the proposed changes to Low Carbon Fuel Standard. BAC is extremely concerned that the proposed changes will hurt or even stop production of instate biomethane at precisely the time when production needs to increase to meet the requirements of SB 1383 and other important state policies. In particular:

150.1

- The changes to avoided methane crediting, especially for diverted organic waste projects, could result in far higher value for out of state projects where landfill diversion is not required than for instate projects that are helping to meet the requirements of SB 1383.

150.2

- The failure to adopt a meaningful delivery requirement will continue to put instate projects at a disadvantage since California has more stringent environmental, labor, pipeline injection, and other standards.

150.3

- The definition of "food scraps" should be corrected to be consistent with CalRecycle's definition.

150.4

- The increased carbon intensity reduction required in 2030 is not sufficient to boost credit prices and should be more stringent with a more significant step down in 2025 target and a 2030 target of 35 percent.

150.5

- CARB should move forward on the development of new markets for biomethane, as committed to in the Advanced Clean Fleets resolution adopted in April 2023.

BAC represents about 100 public agencies, private companies, and non-profit organizations working to convert organic waste to energy. BAC's public sector members include cities and counties, Tribes, local air districts, environmental and solid waste agencies, wastewater treatment facilities, public research institutions, community and environmental groups, and a publicly owned utility. BAC's private sector members

include bioenergy project developers, technology providers, investors, an investor owned utility, waste haulers, food processing and agricultural companies, and more.

BAC submits the following comments on the proposed changes to the LCFS.

1. The Proposed Phaseout of Credit for Avoided Methane Should be Consistent with SB 1383 and Should Not Put Instate Producers at a Severe Disadvantage.

150.6

The proposed regulations will severely impact instate projects that are converting diverted organic waste into low carbon fuels. The 45-day language released in January would end credit for avoided methane emissions that are required by law, but California is the only state with a 75 percent landfill diversion target beginning next year. That means that diverted organic waste projects in California may no longer receive credit for avoided methane emissions, but out of state projects using diverted organic waste will continue to receive credit for avoided landfill emissions.

As a consequence, out of state fuels produced from diverted organic waste could still have carbon intensities of negative 100 to negative 200 while instate fuels produced from diverted organic waste would have positive carbon intensities and be worth a small fraction as much under the LCFS. The LCFS would then provide far greater incentives for out of state projects than instate projects doing the same thing. This will slow or potentially even reverse progress in reducing California's organic landfill waste, impair progress in meeting the requirements of SB 1383, and put instate projects at a huge disadvantage.

Combining this change with the failure to meaningfully phase out credit for undelivered biomethane essentially means that the LCFS will no longer work for diverted organic waste projects instate that can no longer compete with out of state projects. This is exactly the opposite of SB 1383's requirement that state agencies adopt policies and incentives to increase the instate production of biogas and biomethane.¹

Ending the avoided methane credit for diverted organic waste projects is also not supported by the science. SB 1383 requires landfill diversion of organic waste, but it does not require that diverted organic waste be converted to energy or fuels. CalRecycle's SB 1383 regulations authorize far higher emission alternatives to bioenergy, including compost production and mulch. Even if fuels from diverted organic waste should no longer receive credit for avoided landfill emissions, they should still receive credit for avoided emissions from other allowable alternatives such as compost production. Numerous studies have found that bioenergy provides several times greater carbon reductions than compost. The State of Oregon's Department of Environmental Quality conducted a literature review of 148 separate studies and found that bioenergy plus composting the remainder (digestate) provides 3.5 times greater

¹ Health and Safety Code section 39730.8.

150.6
cont.

carbon reductions than compost alone.² CalRecycle affirmed this recently when it determined that a diverted organic waste to hydrogen project will have lower emissions than if that same waste were converted to compost (the finding required under Article 2 of CalRecycle's SB 1383 regulations). None of this is to dismiss the value of compost, but where low carbon fuel can be generated instead, the difference in emissions should still be valued under the LCFS.

BAC urges CARB to correct the 45-day language on avoided methane emissions from diverted organic waste projects in the following ways:

150.7

A. Update the calculation of landfill methane leakage to reflect actual monitoring data rather than outdated estimates. The Tier 1 calculator bases avoided methane emissions on significant underestimates of landfill methane emissions from poorly controlled landfills. According to a recent study by Harvard, actual emissions at those landfills is 50 percent greater than prior estimates.³ CarbonMapper, using monitoring data from NASA's Jet Propulsion Lab, has found that landfill methane leakage is three times higher than reported.⁴ To accurately account for avoided landfill emissions, it is critical to start with an accurate baseline of methane leakage at landfills.

150.8

B. Do not discontinue credit for avoided methane emissions based on "targets" for landfill diversion that are not binding legal requirements. The 45-day language recognizes that credit should not be given for emissions reductions that are required by law, but SB 1383 only sets statewide targets, not binding legal requirements. Health and Safety Code section 39730.6(a) states that "methane emissions reduction goals shall include the following targets to reduce the landfill disposal of organics." (emphasis added) Since organics diversion is a target, not a binding legal requirement, the LCFS should continue to provide full credit for avoided methane emissions from diverted organic waste projects.

150.9

C. If CARB decides nonetheless that it should phase out credit for avoided methane emissions from diverted organic waste, then it should do so only to the extent that organic waste is actually being diverted. This should be based on statewide diversion rates and updated every three years. For example, if California achieves statewide diversion of 25 percent of its organic landfill waste by 2030, the fuels generated from diverted organic waste would only receive 75 percent credit for avoided landfill emissions.

150.10

D. Crediting for avoided landfill emissions should be the same for instate and out of state biofuels. Out of state fuels produced from diverted organic waste should be based on the same diversion rates as achieved in California so that projects in

² Morris, et al, *Evaluation of Climate, Energy, and Soils Benefits of Selected Food Discards Management*, Prepared for the State of Oregon Department of Environmental Quality, October 2014, Table ES-2 at page iii.

³ <https://www.oregister.com/2024/05/04/tech-meets-trash-in-orange-countys-landfill-future/>.

⁴ Id. and <http://methane.jpl.nasa.gov/>

states without diversion targets do not have a competitive advantage over California projects that provide the same reductions and greater benefits overall.

- 150.11 E. Biofuels (biomethane, electricity, or hydrogen) from diverted organic waste should continue to receive credit for the difference between their avoided methane emissions and the avoided methane emissions achieved by the highest emitting procurement product allowed under CalRecycle's SB 1383 regulations. As noted above, projects that produce both bioenergy and compost provide several times greater carbon reductions than compost only projects, so the LCFS should continue to provide credit for the additional methane reductions that fuels from diverted organic waste provide compared to other alternatives under CalRecycle's regulations.

These corrections to the 45-day language are essential to maintain progress on organic waste diversion and Short-Lived Climate Pollutant reductions.

2. BOOK AND CLAIM SHOULD BE CONSISTENT WITH THE RPS AND SB 1440.

150.12 BAC urges the Air Board to go back to the staff recommendations in 2022 and 2023 that would have phased out undelivered biomethane consistent with the RPS and SB 1440. As BAC noted in its February comments on the 45-day language, continued credit for undelivered fuels harms California's climate and air quality goals for several reasons, including:

- Undelivered biomethane does not help California to reduce SLCP emissions.
- Undelivered biomethane means that California vehicles will continue to use fossil gas, contradicting one of two primary goals of the program, which is to reduce fossil fuel use on the road in California.
- Allowing undelivered biomethane puts instate projects at a severe disadvantage since instate production can be significantly more expensive due to stronger environmental, labor, pipeline injection, and other standards.
- Undelivered biomethane does not help to reduce landfilling, pollution from dairies, or wildfire risks, nor does it provide as many jobs and economic development in California.

For all these reasons, BAC urges the Air Board to go back to the staff proposals on the LCFS, which would have phased out undelivered biomethane consistent with the RPS and SB 1440. The 45-day language does not do this in any meaningful way. Projects built before 2030 will never be required to deliver their biomethane to California. And projects built after 2030 do not have to show delivery until 2040 or later and, even then, only have to inject the biomethane into a pipeline that flows in the general direction of California. This is not a clear standard and definitely does not ensure that the

biomethane will help reduce SLCP emissions instate or provide other environmental benefits in California.

150.13 BAC supports the use of Book and Claim for biomethane that is both generated and used in California or the western United States, whether it is used offsite as biomethane, for low-CI electricity generation or for hydrogen production. BAC urges the Air Board to clarify in the amendments to the LCFS regulation that book and claim for biomethane converted to low-CI electricity is allowed, provided that both the biomethane and low-CI electricity production are consistent with the RPS. This could be done by adding conversion of biomethane to low-CI electricity in Sections 95488.8(i)(2) and 95488.8(g)(1)(A)(2).

3. CARB Should Identify and Develop New Markets for Biomethane, as Committed to in its Advanced Clean Fleet Resolution.

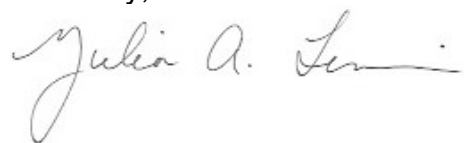
In its April 2023 Resolution on Advanced Clean Fleets, CARB recognized the need to develop new markets for biomethane to move it to hard to electrify end uses. As the Board Resolution stated:

“the Board recognizes that the successful implementation of the food waste diversion requirements and methane emissions reductions mandated by SB 1383 are critical to the State’s climate goals. The Board further recognizes that multiple reliable uses for non-fossil biomethane will be needed for successful implementation . . . As such, the Board directs staff to prioritize policy discussions related to SB 1383 and SB 1440 implementation and discussions on how to transition biomethane into hard to decarbonize sectors, or as a feedstock to produce hydrogen for FCEV fuel and to produce electricity to charge BEVs to achieve the SB 1383 target.”

150.14 BAC urges CARB staff to move forward on the development and implementation of new, reliable markets for biomethane as directed by the Board more than a year ago. This is critical to avoid backsliding on the state’s SLCP reductions, which will happen if biomethane is phased out of the transportation sector before new markets are developed. BAC looks forward to working with CARB on this and urges CARB to begin the process immediately.

Thank you for your consideration of these comments.

Sincerely,



Julia A. Levin
Executive Director

May 10, 2024

Rajinder Sahota, Deputy Executive Officer
California Air Resources Board
1001 "I" Street
Sacramento, CA 95814

RE: PG&E Comments on the Low Carbon Fuel Standard Public Workshop on Proposed Amendments

Pacific Gas and Electric Company (PG&E) appreciates this opportunity to comment in response to the California Air Resources Board's (CARB) public workshop held on April 10, 2024, to discuss the proposed amendments to the Low Carbon Fuel Standard (LCFS) program, public comments received, and Staff's related additional analysis.

PG&E Encourages an Expedient Conclusion to this Regulatory Amendment Process

151.1

PG&E supported the delay of the March Board hearing and understands CARB's cautious and deliberate approach to decision making around this incredibly important and nuanced program. Indeed, the large volume of public comments provided to CARB and the importance of the concerns raised by stakeholders about CARB's proposed amendments warrants additional consideration, and the April public workshop provided an important venue for this discourse to continue. However, PG&E reiterates the importance of moving this regulatory package across the finish line as soon as practicable. The investments at stake in support of attaining the State's various energy, environmental and clean transportation goals are too important to let linger indefinitely, and the current market imbalances are too significant to let the perfect be the enemy of the good in finalizing the current regulatory process.

151.2

While PG&E encourages serious consideration of stakeholder comments, sufficient analysis of the pros and cons of large-scale modifications such as removal or limitations on different fuel sources must also be weighed against several other factors. This includes taking a technology agnostic approach, and the urgency of adopting amendments related to increasing the stringency of the program, stabilizing the market, and further enabling LCFS revenue to accelerate transportation electrification in the near-term. PG&E notes that this is not the final opportunity CARB and stakeholders will have to reevaluate and amend the LCSF program. As new data and information comes forward, PG&E encourages continuous evaluation of

potentially needed programmatic modifications, including those raised in this rulemaking process.

PG&E Supports Program Stringency Increases Beyond What Was Originally Proposed

PG&E appreciates Staff's updated analysis as presented at the April workshop on overall program stringency, initial step-down, and Auto Acceleration Mechanism (AAM) scenarios which looked beyond the options included in the original 45-day regulatory draft. Significant evidence presented in stakeholder comments filed in February, and in subsequent studies and analysis, point to the need to move forward with a larger initial step down in stringency, and potentially greater near-term targets in order to meaningfully balance the market, address the significant credit bank, and correct for the near-term over-performance of the program.¹ As Staff's analysis and independent analyses indicate, an initial step down in 2025 in the range of 9-11% may be needed to accomplish these objectives, and the program may need to contemplate and allow for activation of the AAM as soon as 2026. Additionally, PG&E is supportive of the AAM trigger being set at an average quarterly deficit ratio of 2.0, rather than CARB's currently proposed 3.0, as noted in AJW's February comments to CARB.²

As recent past history demonstrates, California has an enduring ability to overperform and exceed what may seem like distant decarbonization projections. PG&E encourages decision making related to these important provisions to "...anticipate rapid and sustained decarbonization progress through the next 10+ years" as posited by Staff.³ Success cannot result in undermining the investments in electric cars, trucks, buses, ZEV charging and other low-carbon fuel infrastructure that underpins that very success. Accordingly, it is essential that the stringency be increased appropriately and expeditiously and be implemented as soon as possible to ensure the LCFS program continues to contribute meaningfully to the state's clean air, climate change, and zero-emission transportation requirements and goals.

¹ See ICF's Response to Staff Report, "Analyzing Future Low Carbon Fuel Targets in California", available at: <https://static1.squarespace.com/static/5b57ab49f407b4a7ffa44ffa/t/65cd3c74d1a72f445cdc7a7e/1707949173143/ICFReport2024.pdf>

² At p. 2. "AJW encourages CARB to reassess the proposed threshold when considering the credit bank to average quarterly deficit ratio formula, which is currently proposed at 3.0 (i.e., three quarters of credits in the credit bank). This, when combined with the threshold of 1.0 for the credit generation to deficit generation formula (i.e., credits are continuing to contribute to a growing cumulative bank), is an overly conservative proposal as it would not allow for the AAM to trigger in situations where there is general consensus on the overperformance of the program. For example, looking at recent LCFS history, this 3:1 ratio the AAM would not have been triggered even in 2022 despite most stakeholders observing that the LCFS was overperforming and needed adjustments to program stringency to course correct. After backcasting recent LCFS activity, we are instead recommending the average quarterly deficit ratio should be 2.0. The impact of this threshold would mean that the credit bank is able to cover one-half a year of deficits. Today, that would mean that credit production would need to fall by 50% to create that level of demand. Given this, a threshold of 2.0 appears ample, when taken in combination with the consideration of whether credits are continuing to outperform deficit generation." Available at <https://www.arb.ca.gov/lists/com-attach/6795-lcfs2024-BTdVZwAxBGUDNwk5.pdf>

³ See Staff April Workshop Slide 49.

Utility LCFS Programs are Critical in Supporting Equitable Zero Emission Vehicle Adoption and Ratepayer Benefits

151.5 PG&E emphasizes the critical importance of utility LCFS funding in delivering significant EV adoption, EV equity and ratepayer benefits to PG&E's customers and utility customers more broadly. LCFS represents a unique opportunity to support transportation electrification without using ratepayer funding, and over a quarter of a million vehicles for customers in nearly every corner of PG&E's service territory have already benefitted (54% of all EVs registered in PG&E's territory). Over \$250 million in incentives have been paid to PG&E customers through LCFS-funded programs to fuel this progress, doing so with no upward impact to customer electricity bills. Funding a portion of PG&E's EV programs through LCFS rather than through ratepayer funding saved the average residential customer an estimated \$40 on their bills from 2016-2023 – about \$5 per year.

These programs have made a significant investment and impact in addressing EV equity, providing incentives to over 21,000 California Alternative Rates for Energy (CARE) reduced rate customers and 14,000 customers living in Disadvantaged Communities within PG&E's service territory. Moreover, income-qualified EV buyers make up 33% of all rebates paid through PG&E's Pre-Owned EV Rebate program, which provides rebates for used EV purchases/leases, and renters make up 23% of the Pre-Owned EV Rebate recipient pool. Income-qualified customers can take advantage of a \$4,000 rebate for a pre-owned EV and a \$700 rebate for a charging station – both funded by LCFS – and a \$2.10 eGallon price when combining the CARE reduced rate with PG&E's EV-2A rate. PG&E's proposed LCFS programs, if approved by the California Public Utilities Commission, will add a prepaid debit card for public charging worth up to \$50 a week, and \$4,000 for panel upgrades. These facts dispel the myth that low-income drivers don't drive EVs, while underscoring the critical importance of LCFS funding in enabling and accelerating an equitable EV transition.

Important Modifications to the 45-Day Regulatory Text are Needed to Enable and Maximize Utility Support for and Customer Benefits from LCFS

PG&E's February 20 comments detailed a list of largely technical changes and fixes to the 45-day regulatory draft, that while potentially appearing minor, are in fact critically important to our ability to effectively propose, administer and run LCFS-funded programs and projects for our customers that best serve their needs and the needs of the grid. At a high level, these necessary modifications include:

- 151.6
- Merging the proposed two separate holdback project lists into a single project list, and clarifying that certain project types are considered equity regardless of their geographic location;

- 151.7 • Aligning CARB’s increased equity requirement of 75% for large Investor-Owned Utilities (IOUs) with the CPUC requirements for all aspects of the requirement, not just the reporting percentage;
- 151.8 • Ensuring that grid-side investments that support both light-duty and medium/heavy-duty (MHD) EV charging be eligible for equity spending requirements, if serving projects in an equity community;
- 151.9 • Reverting to a 10% cap on equity administration spend for holdback programs, expanding the definition of administrative costs to include program-specific costs aligned with how utilities report for other regulators, and clarifying that this excludes start-up costs and marketing, education, and outreach (ME&O) costs; and
- 151.10 • Making key edits to the proposed third-party verification requirements for electricity pathways to accommodate the unique, distributed nature of EV charging.

Further detailed explanations of these important, necessary changes are provided in our February 20 comments.⁴ We encourage review and incorporation of these critical modifications.

Restrictions on MHD Fast Charging Infrastructure (FCI) Capacity Credit Projects to a One-Mile Radius from Major Highways should be Removed

- 151.11 In addition to the changes detailed in our 45-day comments, PG&E reiterates an important consideration several other commenters highlighted in their February comments, and which PG&E, alongside SCE and SDG&E, jointly raised in an October 2nd, 2023 email to Staff supporting the proposed new MHD vehicle FCI program. PG&E continues to believe that CARB should not include the proposed one mile from a major highway limitation for several reasons, but in particular because these deployments will require significant available utility grid infrastructure with capacity to interconnect new loads, which may not always align with highway corridor infrastructure. Overly restricting the eligible locations for funding from the FCI program could create adverse impacts on the grid, delay deployment and increase overall cost.

PG&E reiterates these concerns and notes that further internal analysis has validated the potential adverse impacts of this requirement as it relates to our distribution system. The requirement has the potential to put undue costs on ratepayers and delay the deployment of critical MHD charging infrastructure. Accordingly, PG&E recommends that CARB allow for greater flexibility in allowable locations for sites seeking to claim MHD FCI credits.

⁴ PG&E Comments: <https://www.arb.ca.gov/lists/com-attach/7082-lcfs2024-BmpRNFUyUnlEXQM3.pdf>

Conclusion

PG&E looks forward to continuing collaboration with CARB staff and public stakeholders on potential amendments to the Program that will best support the State's climate goals in a timely, and effective manner.

Sincerely,

/s/

Fariya Ali

Air & Climate Policy Manager

May 10th, 2024



The Honorable Liane Randolph
Chair California Air Resources Board
1001 I Street
Sacramento, CA 95814

Dear Chair Randolph:

As a developer of dairy digester RNG and biogas-to-electricity projects for EV charging in West Coast states, Promus Energy appreciates the opportunity to comment on the proposed changes to the CA Low Carbon Fuel Standard (LCFS). Promus values CARB's serious consideration and incorporation of feedback provided by us and other stakeholders as revisions to the LCFS program have been carefully crafted over the last several years. We urge CARB to move forward at pace with the long-anticipated, and urgently needed, LCFS program rules package.

Promus appreciates CARB's continued effort to refine the LCFS program with a science-based, data-driven approach and for presenting detailed analysis and modeling scenarios for the April 2024 workshop.

Carbon Intensity Target Adjustments

- 152.1 The LCFS program is the single most important driver of the low carbon fuels market in the US, and its near- and long-term strength and stability are essential to meet climate goals. Promus supports an immediate step down of at least 5% (or 9%, which better reflects the need to immediately bring credits and deficits into better balance) and at least a 39% CI reduction target by 2030 to ensure both near- and medium-term strength in the credit market. A 39% CI reduction by 2030 is consistent with the 2 AAM trigger scenario CARB presented during the April 2024 workshop. While that scenario appeared very promising from the standpoint of drawing down the credit bank and keeping prices strong and stable
- 152.2 long-term, the reliance in that scenario on the AAM triggering twice before 2030 adds an element of risk to investors looking at financing low carbon fuels projects. Rather than relying on AAM triggers – important as they are -- Promus believes that setting the 2030 target at a 39% reduction will give investors confidence that the credit market will be strong between now and 2030. However, Promus prioritizes CARB finalizing the new rules quickly and would accept the previously proposed 2030 target if it means the rulemaking process can be completed more quickly.
- 152.3 The AAM proposed in the updated LCFS rules package is an absolutely necessary reform to prevent a repeat of the boom-and-bust cycle that occurred after the 2017 LCFS amendments and to keep credits and deficits in balance. Promus joins other commentors in urging CARB to allow the AAM to trigger before 2027 to prevent market instability within the next few years.

Sustainability Guardrails on Crop-Based Biofuels

- 152.4 Sustainability guardrails on biofuels are appropriate to prevent adverse land use changes and to ensure that priority is placed on waste-based fuels that have a lower CI than crop-based biofuels. While Promus supports sustainability guardrails on biofuels, we also recognize that fundamental changes to feedstock

152.4
cont. eligibility in the LCFS could lead to the canceling of projects or stranding of assets used to produce biofuels that currently flow into California. CARB should however place a priority on leveling the playing field by fully accounting for all externalities when calculating CI scores for biofuels in the GREET 4 calculator.

Dairy Biogas Avoided Emissions Crediting

152.5 Promus supports CARB's commitment to continue dairy biogas avoided emissions crediting. This approach ensures that there are long-term crediting opportunities available to finance projects that capture and eliminate methane emissions at dairies. Biomethane pathways (to RNG, hydrogen, electricity, etc.) are some of the only fuels that will be credit generators as the CI compliance curve approaches 90% by 2045. CARB's analysis and studies confirm that targeting avoided methane emissions produces the most bang for the buck and that it is needed to achieve the goal of a 90% reduction by 2045.

152.6 Additionally, Promus requests CARB to begin outlining and provide clarity around its desire to long-term channel biomethane to other hard-to-decarbonize sectors. Knowing that there will be sectors outside of the transportation market that will be a market for biomethane will further incentivize the capture of methane and help California meet its emissions reductions goals.

We appreciate the opportunity to provide feedback on the proposed changes to the LCFS program and we encourage CARB to finalize the rules quickly and send them to the CARB Board for approval this summer.

Thank you for your consideration.

Sincerely,

Dan Evans, President
Promus Energy LLC
1201 Third Ave., Suite 320
Seattle, Washington 98101
dan@promusenergy.com
206.300.0835

May 10, 2024

Hon. Liane M. Randolph, Chair
California Air Resources Board
1001 I Street
Sacramento, California 95814

Re: Proposed Low Carbon Fuel Standard Amendments

Dear Chair Randolph:

Thank you for the opportunity to comment in response to the April 10, 2024 Public Workshop that the California Air Resources Board ("CARB") held to discuss the proposed Low Carbon Fuel Standard ("LCFS") amendments.

Bunge supports the comments submitted by the National Oilseed Processors Association ("NOPA"); NOPA is the leading industry group for the oilseed processing sector, and Bunge supports the positions NOPA has expressed to CARB in its submission to CARB. In addition, Bunge writes to share four recommendations to improve the proposed sustainability certification requirement for crop-based fuels and address CARB's land-use change concerns. First, CARB should adopt a risk-based approach to sustainability certifications. Second, CARB should not require segregation of certified and uncertified feedstocks. Third, a mass balance approach to chain of custody should be accepted. And fourth, the compliance timeline should be extended. Each recommendation is discussed in more detail in Part II.

I. Background

Bunge is the world's largest oilseed processor by crush volume capacity. Bunge buys and processes agricultural commodities, turning them into products used in the food industry, animal feed, and the renewable diesel industry. Bunge is also an industry leader in sustainability, embracing climate-focused decision making and setting ambitious goals. For instance, we are well on our way to meeting our commitment to eliminate deforestation and native vegetation conversion from our supply chain in 2025. We are also helping accelerate industry-wide progress through sector initiatives that seek to create common alignment and scalability on deforestation goals. Bunge's robust traceability and monitoring systems give us unprecedented insight into our supply chain. We achieved 97.7 percent traceability in our indirect supply of soy in Brazil's high-risk areas in 2023. Further, we have already achieved 100 percent traceability in our direct supply of soy in priority areas in South America. We are leveraging our experience working with farmers and incentivizing sustainable practices using technology and data to scale

our efforts across the wider agribusiness sector in many geographies where deforestation is a higher risk.

Bunge supports the LCFS, and we are proud of the role that we have played in the program's success. CARB's implementation of the LCFS has increased volumes of low-carbon fuels—including the biofuels that Bunge helps produce through supplying oilseed feedstocks to biofuel producers—such that California's overall petroleum fuel use has fallen by 1.3 billion gallons since 2019. Meanwhile, the carbon intensity ("CI") of the state's transportation fuels has declined 12.63 percent from 2010 levels.

With the LCFS's success in mind, we supported CARB's decision to reject an arbitrary cap on crop-based fuels in the December 2023 45-day package, as we expressed in our February 2024 comment letter. At the public workshop in April 2024, we were encouraged to hear CARB staff recognize that a cap would encourage continued fossil fuel use and conflict with CARB's mandate as a public health and environmental agency. An arbitrary cap on crop-based fuels would also undermine the science-based approach that is fundamental to the LCFS's success.

II. Four Recommendations to Improve CARB's Sustainability Certification Proposal

As a leader in renewable fuel feedstocks and sustainable practices, Bunge is concerned about aspects of CARB's proposed requirement that crop- and forestry-based feedstocks "maintain continuous third-party sustainability certification" to demonstrate they were not "sourced on land that was forested after January 1, 2008." See Proposed Regulation Order at § 95488.9(g).

We have expressed our concerns while meeting with CARB staff and in our February 2024 comment letter on the 45-day package. We follow up in today's comments with more detail on four specific recommendations that would address our concerns and achieve CARB's goals.

A. A Risk-Based Approach Should Be Adopted

We recommend that CARB adopt a risk-based approach to sustainability, which would tailor measures to regions based on the real-world deforestation risk in specific geographies.

Bunge has substantial experience implementing sustainability certifications to meet our voluntary commitments and comply with the European Union's Renewable Energy Directive ("RED"). For example, Bunge has certified products using systems from the Round Table on Responsible Soy ("RTRS"), Biomass Biofuel Sustainability Voluntary Scheme ("2BSvs"), and International Sustainability and Carbon Certification ("ISCC").

Our experience with these certifications confirms that required traceability and monitoring can be important tools in certain environments. Our approach focuses on addressing areas where the risk of land-use change is highest, such as South America. In keeping with this approach, our traceability and monitoring systems track soy to the farm level in the Gran Chaco in Argentina

and Paraguay and the Cerrado in Brazil. Full traceability in these contexts is a logical solution, and one commensurate with the identified risk of deforestation. Bunge views certification schemes, such as ISCC RED, as appropriate and useful in these high-risk environments.

However, agricultural expansion pressure is far lower in the United States and Canada. In fact, U.S. farmers today produce higher crop volumes on the same amount of land (or slightly less) than 40 years ago, according to U.S. Department of Agriculture data. In this context, implementing a full-traceability system like ISCC RED would be a complicated endeavor with little upside. Certifications devised for high-risk regions are a poor fit for these low-risk growers.

The best solution is a risk-based approach. A risk-based approach would set certification measures for particular regions based on their real-world deforestation risk. Full traceability and monitoring could be implemented in high-risk regions, such as South America. Less onerous approaches would be applied in North America, where experience and data demonstrate that the risk of deforestation is so low that ISCC RED-level certifications would have little benefit. For further details on implementing a risk-based approach, Bunge refers CARB to the NOPA comment letter.

B. Physical Segregation Should Not Be Required

Bunge recommends that CARB make clear in its final regulations that physical feedstock segregation is not required to comply with the LCFS sustainability certification requirements.

Bunge is concerned that the proposed regulation and its sustainability certifications could require full physical segregation of certified crops from uncertified crops. The U.S. agricultural supply chain is not set up to segregate soy and other commodities in this way. As NOPA notes in its comments, the U.S. grain system operates at a level of complexity not seen in other countries. For instance, more than 300,000 U.S. farmers deliver grain to more than 8,000 storage points in the domestic supply chain. In contrast, most other countries have less elaborate supply chains and fewer delivery points, making segregation far more feasible in those countries. Indeed, segregated supply chains are more common in those countries in part because of those countries' higher deforestation risk. The lower deforestation risk in the United States and Canada is another reason that segregation should not be required in North America.

In sum, requiring full physical segregation of certified crops from uncertified crops in North America would be extremely difficult. Nor would North American segregation achieve the deforestation goals it seeks to accomplish in South America, because deforestation risk is low to nonexistent in North America. We recommend that CARB clarify in its final rule that segregation is not required to satisfy the sustainability certification requirements in the United States and Canada.

C. Mass Balance Should Be Accepted for Chain of Custody

We recommend that CARB accept a mass balance approach to chain of custody, rather than requiring full physical segregation.

Mass balance allows entities to track the amount and sustainability characteristics of certified feedstocks through the value chain, and to attribute those characteristics based on verifiable bookkeeping. As explained in Part II.B, segregation would be a huge logistical hurdle in the United States. A mass balance approach to chain of custody would be an effective, commonsense alternative to physical segregation. Moreover, mass balance would accomplish CARB's sustainability goals more practically than segregation. The rigorous ISCC standard accepts a mass balance approach, reinforcing that this approach should also be accepted in the LCFS context. See, e.g., ISCC EU 203 Traceability and Chain of Custody, § 4.4.

Bunge encourages CARB to clarify and confirm that a mass balance approach to chain of custody will be acceptable under the final LCFS regulation.

D. The Compliance Timeline Should Be Extended Beyond 2028

Bunge recommends that CARB extend the sustainability certification implementation timeline beyond 2028 to provide sufficient time for the rules to be implemented among growers in regions like the U.S. and Canada.

CARB's proposal requires crop-based feedstocks be certified at the point of origin by January 1, 2028. For a certification system to be approved, it must have been recognized by a government for at least 24 months. In other words, market participants have less than four years to implement certifications, and any certification scheme used must be recognized by a government now or in the very near future due to the 24-month criterion. But today, almost no North American growers have sustainability certifications in place. The initial response from North American growers may be one of skepticism due to the low risk of deforestation in the region, so it may take time to implement a system that growers feel comfortable with. U.S. and Canada compliance will thus be complex.

In light of this U.S. and Canada implementation challenge and the other unresolved concerns addressed in Part II, we encourage CARB to adopt an extended compliance timeline that gives North American growers sufficient time to implement sustainability certifications.

III. Conclusion

Bunge commends CARB's commitment to improving the LCFS in the 2024 amendments, including its decision to maintain a role for low-carbon biofuels.

Bunge has unique insight into sustainability certifications as an industry leader that has implemented these schemes to meet voluntary goals and comply with EU regulations. This first-hand experience means that Bunge appreciates and understands CARB's concerns about land-

use change. It is because we share CARB's concerns that we have committed to eliminate deforestation and native vegetation conversion from our supply chain in 2025. We believe that the recommendations that we have offered in this comment letter can help CARB address its concerns, while avoiding the pitfalls and implementation issues that Bunge has identified.

We appreciate the opportunity to share Bunge's perspective and to advance our common goal of a deforestation-free fuel supply.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert Coviello". The signature is fluid and cursive, with the first name "Robert" and last name "Coviello" clearly distinguishable.

Robert Coviello

Chief Sustainability Officer and Government Affairs

Submitted Comment

Name

Phoebe Seaton

Affiliation

Coalition to Fix the LCFS

Subject

Fix the Low Carbon Fuel Standard -Stand Strong for Environmental Justice, Clean Air and a Stable Climate

Message

On behalf of 50 cross-sectoral public interest organizations across the country, we respectfully submit the attached comments urging the California Air Resources Board to fix the Low Carbon Fuel Standard. Our organizations remain concerned that, as the Staff proposal stands, the LCFS will continue to drive investments toward false climate solutions that perpetuate environmental injustice across the country and undermine CARB's efforts to transform our transportation system toward truly zero-emissions solutions. The Board's guiding light should be to use the program to support the advancements that make CARB a world leader in air and climate action.

Doing so means:

Ending lavish incentives to factory farms across the country to produce methane and factory farm gas that California does not need.

Capping the unfettered rise of biofuels, which pose grave risks to our climate and ecosystems, and which are driving a glut of credits that is weighing down the program.

Enhancing support for truly zero-emissions solutions.

Not relying on offset projects like direct air capture and factory farm gas to decarbonize the transportation sector, as this is a way for the oil industry to justify its continued operations and pollution in communities.

We ask that you prioritize the health of communities and the climate first and fix the LCFS.

File Upload (i.e., Attachments):

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(800) 242-4450 | helpline@arb.ca.gov

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May 10, 2024

Ms. Rajinder Sahota
Deputy Executive Officer - Climate Change & Research
California Air Resources Board
1001 I Street
Sacramento, California 95814

Re: California Bioenergy's Comments on CARB's April 10th, 2024 Public Hearing on the Low Carbon Fuel Standard

Dear Ms. Sahota,

Thank you for the opportunity to provide these comments to California Air Resources Board (CARB) relating to the Low Carbon Fuel Standard (LCFS) Public Hearing which took place on April 10th, 2024. California Bioenergy LLC (CalBio) is appreciative of CARB's efforts over the past several years to develop the LCFS program into one of the most impactful policies to support the transition from fossil fuels to lower carbon alternatives. There are few programs in the world which can boast the significant decarbonization of the transportation sector through sound science and policy. We write these comments from the perspective that the climate emergency demands CARB strengthen the program to support achievement of California's legislatively-mandated greenhouse gas (GHG) reduction targets.

Founded in 2006, CalBio works closely with California dairy farm families, dairy co-ops and cheese producers, CARB, the California Department of Food and Agriculture (CDFA), the California Public Utility Commission (CPUC), the California Energy Commission (CEC), and the U.S. Environmental Protection Agency (EPA). We exist to reduce methane emissions and are committed to enhancing environmental sustainability for all Californians. CalBio's digester projects produce carbon-negative renewable natural gas and electricity, both used as a vehicle fuel to power low-emission trucks, buses, and cars. Our projects create the following in-state benefits:

- Reduce GHGs which help the state achieve the legislated carbon reduction goals.
- Support SB1383 methane reduction goals.
- Produce renewable energy that displaces fossil-derived fuels such as diesel, gasoline, and natural gas.
- Improve local air quality by reducing emissions and formation of H₂S, PM, SO_x, and NO_x.
- Direct investment and job creation in disadvantaged communities.
- Invest in the community by creating scholarships, supporting affordable housing and engaging in community benefits agreements.
- Provide a new revenue stream along with other meaningful benefits to our multigenerational dairy partners.



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In our comments below, we suggest practical and necessary revisions which serve to improve the LCFS program in its ambition to reduce GHG emissions and implement a successful program.

1. CalBio recommends a 9% stepdown in 2025

155.1

As of Q4 2023, the LCFS credit bank has swelled to more than 23.5 million credits, largely driven by growth in renewable diesel, electricity, and biomethane. The program has become a victim of its own success and now overcompliance threatens to stifle investment making it uneconomic to build new projects under the current market conditions.

155.2

In the April 10th, 2024 workshop, CARB covered various scenarios of strengthening a near-term stepdown, showing the current 5%, 7%, 9%, as well as a 5% scenario in which the AAM is triggered twice. In the interest of moving swiftly to a final rule that can be implemented, CalBio recommends a stepdown of at least 9% in 2025. We further recommend that CARB retain the annual rate of CI reductions proposed in the 45-day package to complement increasing the step down in 2025 to 9%. This means that with a 9% step down in 2025 the 2030 CI reduction target should be 34%. However, it is important for CARB to recognize CATS modeling inputs and outputs represents a significant understatement of the reality of low carbon fuel production from operating facilities. For example:

155.3

- Our review of industry RD-SAF plants that have recently commenced operation and have announced intentions to direct more supply to California indicates that the CATS model is underestimating supply by approximately 1 billion gallons in 2024.
- Similarly, based on our review of the LCFS quarterly report and built projects, we believe the CATS model is severely underestimating dairy RNG production by at least 92 million gallons (Q4 2023 annualized) in 2024 and 100 million gallons in 2025.
- Of additional importance, we would like to highlight that the CATS model does not include a tailpipe emission factor for RD and biodiesel as the April 10th workshop presentation indicates. In our view, this results in greater credit generation for RD and biodiesel production as ULSD is increased by approximately 6 CI points while RD and biodiesel production are unchanged.
- The combined effects of the above could result in a credit bank increase of greater than 10 million credits in 2024 that is not appropriately recognized or accounted for in CARB's modeling.

155.4

The recognition of an oversupplied credit bank is also supported by ICF, an international consulting firm who has been analyzing the LCFS for years. ICF has found that the program could accommodate a near-term stepdown of 10.5-11.5%¹. A stepdown of this magnitude would lead to further investment in low-

¹ <https://www.arb.ca.gov/lists/com-attach/7078-lcfs2024-VDVcNFIyVGsLdFQu.pdf>



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cont.

carbon fuels delivering millions of tons of additional GHG reductions, consistent with CARB's goals for the program and 2022 Scoping Plan.²

2. The Automatic Acceleration Mechanism (AAM) should be allowed to trigger in 2027

155.5

Given even a 9% stepdown will not be sufficient to bring the bank down to a level to incentivize carbon reductions, CalBio recommends allowing the AAM to trigger one year earlier. As currently proposed, the AAM will not kick in until 2028 based on the 2026 data.

CalBio does not believe there is any reason to delay implementation of the AAM. Delaying and waiting to review the market performance until 2027 creates the likelihood for excessive bank builds in 2025 and 2026, leading to further stagnation of investment in low-carbon fuels. Such a delay in investment now will make it harder for CARB to achieve its carbon reduction targets in the out-years of the program when decarbonization will be more challenging. In particular, the dairy digester industry is ready to help the state meet its SB1383 methane reduction goals, but the mechanism must be designed properly to achieve those necessary reductions in the future. See our recommendations and rationale below for how the AAM should function.

Specifically, CalBio recommends that the Automatic Acceleration Mechanism be considered on a four-quarter rolling basis, rather than on an annual basis. If the criteria for the AAM are met on a four-quarter rolling basis, then the change in the CI could be implemented on January 1st of the next calendar year after the criteria are met. For instance, evaluating the AAM triggers annually risks missing a bank build and not allowing for a correction for a full 2 years. Consider if the AAM as currently proposed by CARB were in effect in 2022. When evaluating 2022 data in 2023, the conditions triggering the AAM would not have been met which would have led to the bank build in 2023 occurring as it did. The AAM trigger would not occur until May 2024, effective Jan 1, 2025, meaning the depressed market we are observing today would not have been avoided. The AAM as currently proposed is too slow to react to this dynamic of a market. However, if the AAM were allowed to trigger based on a four-quarters rolling basis, the Q1 2023 data would have resulted in a new, lower CI target for January 1, 2024. This approach minimizes the duration of bank builds from 8 quarters to 4 quarters, enhancing market responsiveness.

Lastly, CalBio recommends that the first criteria for the Automatic Acceleration Mechanism be modified such that the mechanism is enacted when the credit bank is more than 2.5 times greater than the quarterly deficits generated on a four-quarter rolling basis (down from the proposed value of 3 times). The reason for this is the first criteria for the AAM would not have been met based on data from 2022 and the market would not have avoided the oversupply of credits we have observed in 2023 and 2024.

² <https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf>



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3. CI True-Ups are Necessary for Proper GHG Accounting

CalBio is appreciative to CARB for proposing a credit True-Up after provisional certification and recognizing the actual GHG reductions that have occurred when a project's CI score decreases.

Unfortunately, this approach fails to recognize, perhaps more importantly, the true GHG reductions that should be credited once the provisional certification is achieved relative to the GHG reductions credited while operating under the -150 CI Temporary Pathway for dairy digesters. It is unclear why CARB deviated from this approach in the proposed rule, particularly when it was workshopped in 2022 during which time it proposed adjusting the temporary CI score and did not contemplate adjustments for subsequent verifications.³

A key point raised in those workshops was the idea that a True-Up would ease the pressure for CARB to review pathways and alleviate concerns with delays in certification. Considering CARB staffing shortages leading to pathway review times often exceeding 18 months from the time they are submitted, it would be in CARB's own interest to give itself the necessary time to review projects without unfairly discounting legitimate GHG reductions for delays outside the project's control. The Temporary CI has been conservatively set to -150 gCO₂e/MJ; this can cost a project millions of dollars while waiting for a return on investment. If this issue is left unresolved, it further poses risks to future investment in projects and reduces the potential for additional GHG reduction opportunities. CARB should be taking steps to encourage development, and credit projects appropriately in the interest of fairness and reflecting true environmental performance.

As it relates to pathways CI score changes, it remains necessary to properly recognize the true environmental performance of all pathways. A project should be able to apply its actual CI score retroactively to the period for which credits were generated at a higher score. Similarly, a project which experiences a CI exceedance to what was previously certified should not be subject to the draconian 4x credit penalties contemplated in the proposed regulation. This rule will only cause projects to report unnecessarily high conservative margins of safety, making already financially challenged projects even more difficult to build, and leaving carbon reduction opportunities on the table. CARB must recognize that CI scores are extremely dynamic at dairy projects given they are based on biological conditions over which the operator has very little control due to shifts in herd populations, temperature, manure management practices, and natural variations in biogas production. An increase in CI is often the result of improved performance and efficiency at a digester, and the project should not be penalized for that. However, CalBio strongly endorses a full credit true-up, in either direction, to maintain proper and true GHG accounting.

³ <https://ww2.arb.ca.gov/sites/default/files/2022-08/August%202022%20Workshop%20Slide%20Deck%20Presentations.v16.pdf>



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4. Allow for Book & Claim of RNG to Off-site Electric Generators

155.7

An important opportunity for CARB to incentivize additional GHG reductions is to expand the language in §95488.8(i)(2) to allow for the book-and-claim of pipeline-injected biomethane to be used to generate Low-CI electricity as a transportation fuel. Currently, CARB recognizes electricity as a transportation fuel in §95482(b) and moreover in §95488.8(i)(1) recognizes that “Low-CI electricity used as a transportation fuel can be indirectly supplied through a green tariff program...or other contractual electricity supply relationship.” This is achieved by REC-matching, where the reporting entity must demonstrate that the low-CI electricity is supplied through book-and-claim accounting to electric vehicle charging provided “that any renewable energy certificates associated with the low-CI electricity were retired in the WREGIS for the purpose of LCFS credit generation” (see §95491(d)(3)). However, in the context of electricity derived from low-CI dairy biogas, this pathway requires the RECs to be created from a generator co-located with the digester.

Given the recognition CARB has for 1) book-and-claim of Low-CI electricity production to be matched to electric vehicles, and 2) RNG injected into the commercial distribution pipeline and withdrawn at a CNG station in California, CalBio argues that by the same logic, RNG injected and withdrawn via book-and-claim should qualify for the purposes of generating electricity. In this construct, RECs generated from an electric generator located off-site from the dairy powered by gas fed through the utility pipeline should similarly be allowed to match RECs to electric vehicles.

This approach aligns with CARB’s existing book-and-claim accounting framework and greater GHG reductions could be realized by making this targeted change to the regulatory text that is in keeping with CARB’s objectives of supporting the transition to zero emission transportation. As noted, this recommendation is fully aligned with CARB’s goals expressed in the Initial Statement of Reasons (ISOR), page 4, which states:

“This regulatory update proposal, which is described in detail in this staff report, is focused on the following key concepts:

- *Increasing the stringency of the program to reduce emissions and decarbonize the transportation fuel sector, which will also aggressively reduce our dependence on fossil fuels;*
- *Strengthening the program’s equity provisions to promote investment in disadvantaged, low-income and rural communities;*
- **Supporting electric and hydrogen truck refueling; (emphasis added)**
- *Incentivizing more production of clean fuels needed in the future, such as low-carbon hydrogen;*
- **Supporting methane emissions reductions and deploying biomethane for best uses across transportation; (emphasis added)**

Further on page 6 of the ISOR, it states:



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*"The purpose of the LCFS regulation is to reduce the carbon intensity (CI) of transportation fuels used in California, thereby reducing GHG emissions, and to **incentivize the production of low-carbon and renewable alternatives, such as low-CI electricity** and renewable hydrogen, and biofuels to displace fossil fuels and allow more energy security in the transportation sector."* (emphasis added)

Further on page 30 of the ISOR, it states:

*"**Biomethane can play a key role in decarbonizing stationary sources** or other energy applications, and the 2022 Scoping Plan Update identifies additional end uses in the industrial, commercial, and residential sectors; production of hydrogen; and **electricity generation by displacing the need for fossil gas.**" (emphasis added)*

155.7
cont.

CARB would be remiss to lose this opportunity to encourage and incentivize low-CI dairy biomethane to be used for electricity generation. This will create an additional market for RNG derived from dairy biogas, as CARB has signaled it is seeking to phase it out of combustion in CNG vehicles and "direct biomethane to sectors that are hard to decarbonize or as a feedstock for energy."⁴ Directing RNG as a feedstock to electricity production is a readily available solution and further encourages grid resiliency which will be necessary as electric vehicle charging scales in the state.

5. Establish a Temporary CI for Dairy Biogas to Electricity

155.8

It is of great concern to CalBio that no Temporary CI for Dairy Biogas-to-Electricity pathways has been established in the LCFS since the program's inception and that CARB has not sought to correct for this in the proposed amendments. The failure to include this provision discriminates and disadvantages in-state dairy digester projects which contribute to California's SB 1383 goals and provide renewable electricity as a grid resource and transportation fuel. As referenced in the ISOR and quoted in CalBio's comments under topic #4 above, one of the **primary purposes** of the LCFS regulation is to incentivize the production of low-carbon and renewable alternatives, such as low-CI electricity.

CARB should correct this oversight given dairy biogas-to-electricity pathways fully reduce methane in the same manner as dairy biogas-to-RNG pathways and thus should be treated equally. Project economics for dairy biogas-to-electricity are generally more challenging than RNG projects given they are currently not eligible to participate under the EPA's Renewable Fuel Standard program or participate in the LCFS and BioMAT simultaneously. Failure to allow electric projects to receive a Temporary CI score further exacerbates the concerns expressed in CalBio's comments under topic #3 by preventing beneficial projects from receiving revenue until the provisional certification is achieved, a process which can last close to two years.

⁴ <https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf>



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559-667-9560

155.8
cont.

It should be noted that CalBio has made significant financial investments in cleaner electricity generating technologies such as Bloom Fuel Cells and Mainspring Linear Generators which convert methane into electricity without combustion. These technologies should alleviate concerns around NOx emissions associated with internal combustion engines. CalBio would be supportive of CARB unlocking the Temporary CI for dairy biogas-to-electricity if it meant requiring the use of a non-combustion technology such as a fuel cell or linear generator.

6. Grandfather Existing Pathways Certified under GREET v3.0

155.9

CalBio is proposing CARB consider grandfathering in pathways which have already been certified under GREET v3.0. These pathways have already undergone the public review and comment period and should remain under models which have been validated and verified through the end of their crediting periods. It would be administratively burdensome to deviate from the modeling that has been established for existing pathways and require unnecessary adjustments to the information CARB and 3rd party verifiers have already reviewed and approved.

7. Section 95491.2 Missing Data Provisions requires significant reforms

The requirements for submitting an Alternate Method Request (AMR) within 10 days after submitting an Annual Fuel Pathway Report (AFPR) as written in Section 95491.2 will be challenging if not impossible to comply with. This is a technical issue and discussion yet important nevertheless to manage projects.

155.10

There are often situations when missing data or other situations requiring an AMR are identified after these deadlines and are deemed necessary after review by a verifier after consulting with CARB. For example, we had a case where a dairy temporarily used a diesel vacuum truck to haul manure from a few pens for two weeks of the year. This information was not reported by the dairy owner until the AFPR site visit, which occurred well after the annual AFPR report deadline. CARB's program should be designed around flexibility and the ability to report accurately without prohibiting the ability to generate credits wholly on account of missing this 10-day deadline. Such an approach is overly punitive for small issues that have a negligible impact on the CI and will not solve CARB's well-intentioned approach to reduce staff time reviewing these issues.

A couple of potential suggestions:

- We suggest a more reasonable 30-day deadline from the date a reason for an AMR is identified by the applicant, the verifier, or CARB. This will allow AMRs to be submitted and reviewed throughout the year and not burden CARB staff time all at once, consistent with CARB's goals of
- Alternatively, we suggest a calendar-based requirement that the AMR be submitted no later than 10-days after the August 31 annual verification deadline which will allow the pathway



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holder to complete verification and work with CARB and the verifier to determine an Executive Officer-approved method.

- Note, this appears to be consistent with the intent as stated in the Appendix E: Purpose and Rationale of Proposed Amendments for the Low Carbon Fuel Standard Requirements:

Providing 10 days after report submittal allows the applicant to ensure they can complete the reporting process and still have up to 10 days to provide the necessary documentation to CARB as part of the alternate method request.

This implies CARB's intent is to allow flexibility on behalf of the pathway holder, but the plain language suggests credits will be invalidated if an AMR is not submitted for an issue that is not known by the pathway holder at the time of the deadline. Furthermore, LCFS credit generators should be afforded the opportunity to work with CARB to "assign a conservative alternate method for use during the missing data timeframe" in the same way that is allowed for deficit generators.

Separately, CARB should specify a lower threshold for "Missing Data" where the requirements to use Table 13 are only triggered if a certain duration or volume of missing data is observed. For instance, if >95% of the data is available, then the default should be that any missing data should be left to a verifier to review and confirm reasonableness rather than prescribing a one-size-fits-all approach. This will reduce the burden on CARB staff while still maintaining a high level of integrity for the data used in a pathway.

Lastly, three out of four data substitution methods in Table 13 require calculations that rely on "quality assured values from the current data year". Using data from the entire data year is unreasonable and will be highly problematic to implement for Quarterly Fuel Pathway Reports. For instance, if there is a metering data outage lasting 20 days covering a period between March and April, according to the guidance this would trigger data substitution requiring use of the "10th or 90th percentile of quality assured value from current data year". However, given that data will continually be collected throughout the remainder of the year, the substituted values will similarly need to change all the way until December 31 of that year. That means potentially every quarter, the previous Quarterly Fuel Pathway Reports which had the affected data period will need to be re-opened to modify values according to the newly collected data. Instead, CalBio strongly recommends CARB limit the substitution to occur using data only within a fixed number of days (30 days before or after), or within the calendar month or calendar quarter as opposed to the entire calendar year (Jan to Dec). Otherwise, this will lead to reporting volumes in the LRT continually needing to be opened up to revise, requiring CARB staff time review and approval for an insignificant change in the number of credits.

CalBio thanks CARB for the opportunity to comment on the LCFS regulations and we look forward to further dialogue on these topics.



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Sincerely,

A handwritten signature in black ink, appearing to read "Andrew Craig", with a large, stylized "C" at the end.

Andrew Craig
Vice President, Greenhouse Gas Programs
California Bioenergy LLC



May 10, 2024

The Honorable Steven S. Cliff
Executive Officer
California Air Resources Board
Sacramento, CA 95814

Re: Proposed Amendments to the Low Carbon Fuel Standard Regulation

Dear Executive Officer Cliff:

I am writing on behalf of the Bioenergy Association of California (BAC) to comment on the proposed changes to Low Carbon Fuel Standard. BAC is extremely concerned that the proposed changes will hurt or even stop production of instate biomethane at precisely the time when production needs to increase to meet the requirements of SB 1383 and other important state policies. In particular:

- The changes to avoided methane crediting, especially for diverted organic waste projects, could result in far higher value for out of state projects where landfill diversion is not required than for instate projects that are helping to meet the requirements of SB 1383.
- The failure to adopt a meaningful delivery requirement will continue to put instate projects at a disadvantage since California has more stringent environmental, labor, pipeline injection, and other standards.
- The definition of "food scraps" should be corrected to be consistent with CalRecycle's definition.
- The increased carbon intensity reduction required in 2030 is not sufficient to boost credit prices and should be more stringent with a more significant step down in 2025 target and a 2030 target of 35 percent.
- CARB should move forward on the development of new markets for biomethane, as committed to in the Advanced Clean Fleets resolution adopted in April 2023.

BAC represents about 100 public agencies, private companies, and non-profit organizations working to convert organic waste to energy. BAC's public sector members include cities and counties, Tribes, local air districts, environmental and solid waste agencies, wastewater treatment facilities, public research institutions, community and environmental groups, and a publicly owned utility. BAC's private sector members

include bioenergy project developers, technology providers, investors, an investor owned utility, waste haulers, food processing and agricultural companies, and more.

BAC submits the following comments on the proposed changes to the LCFS.

1. The Proposed Phaseout of Credit for Avoided Methane Should be Consistent with SB 1383 and Should Not Put Instate Producers at a Severe Disadvantage.

The proposed regulations will severely impact instate projects that are converting diverted organic waste into low carbon fuels. The 45-day language released in January would end credit for avoided methane emissions that are required by law, but California is the only state with a 75 percent landfill diversion target beginning next year. That means that diverted organic waste projects in California may no longer receive credit for avoided methane emissions, but out of state projects using diverted organic waste will continue to receive credit for avoided landfill emissions.

As a consequence, out of state fuels produced from diverted organic waste could still have carbon intensities of negative 100 to negative 200 while instate fuels produced from diverted organic waste would have positive carbon intensities and be worth a small fraction as much under the LCFS. The LCFS would then provide far greater incentives for out of state projects than instate projects doing the same thing. This will slow or potentially even reverse progress in reducing California's organic landfill waste, impair progress in meeting the requirements of SB 1383, and put instate projects at a huge disadvantage.

Combining this change with the failure to meaningfully phase out credit for undelivered biomethane essentially means that the LCFS will no longer work for diverted organic waste projects instate that can no longer compete with out of state projects. This is exactly the opposite of SB 1383's requirement that state agencies adopt policies and incentives to increase the instate production of biogas and biomethane.¹

Ending the avoided methane credit for diverted organic waste projects is also not supported by the science. SB 1383 requires landfill diversion of organic waste, but it does not require that diverted organic waste be converted to energy or fuels. CalRecycle's SB 1383 regulations authorize far higher emission alternatives to bioenergy, including compost production and mulch. Even if fuels from diverted organic waste should no longer receive credit for avoided landfill emissions, they should still receive credit for avoided emissions from other allowable alternatives such as compost production. Numerous studies have found that bioenergy provides several times greater carbon reductions than compost. The State of Oregon's Department of Environmental Quality conducted a literature review of 148 separate studies and found that bioenergy plus composting the remainder (digestate) provides 3.5 times greater

¹ Health and Safety Code section 39730.8.

carbon reductions than compost alone.² CalRecycle affirmed this recently when it determined that a diverted organic waste to hydrogen project will have lower emissions than if that same waste were converted to compost (the finding required under Article 2 of CalRecycle's SB 1383 regulations). None of this is to dismiss the value of compost, but where low carbon fuel can be generated instead, the difference in emissions should still be valued under the LCFS.

BAC urges CARB to correct the 45-day language on avoided methane emissions from diverted organic waste projects in the following ways:

- A. Update the calculation of landfill methane leakage to reflect actual monitoring data rather than outdated estimates. The Tier 1 calculator bases avoided methane emissions on significant underestimates of landfill methane emissions from poorly controlled landfills. According to a recent study by Harvard, actual emissions at those landfills is 50 percent greater than prior estimates.³ CarbonMapper, using monitoring data from NASA's Jet Propulsion Lab, has found that landfill methane leakage is three times higher than reported.⁴ To accurately account for avoided landfill emissions, it is critical to start with an accurate baseline of methane leakage at landfills.
- B. Do not discontinue credit for avoided methane emissions based on "targets" for landfill diversion that are not binding legal requirements. The 45-day language recognizes that credit should not be given for emissions reductions that are required by law, but SB 1383 only sets statewide targets, not binding legal requirements. Health and Safety Code section 39730.6(a) states that "methane emissions reduction goals shall include the following targets to reduce the landfill disposal of organics." (emphasis added) Since organics diversion is a target, not a binding legal requirement, the LCFS should continue to provide full credit for avoided methane emissions from diverted organic waste projects.
- C. If CARB decides nonetheless that it should phase out credit for avoided methane emissions from diverted organic waste, then it should do so only to the extent that organic waste is actually being diverted. This should be based on statewide diversion rates and updated every three years. For example, if California achieves statewide diversion of 25 percent of its organic landfill waste by 2030, the fuels generated from diverted organic waste would only receive 75 percent credit for avoided landfill emissions.
- D. Crediting for avoided landfill emissions should be the same for instate and out of state biofuels. Out of state fuels produced from diverted organic waste should be based on the same diversion rates as achieved in California so that projects in

² Morris, et al, *Evaluation of Climate, Energy, and Soils Benefits of Selected Food Discards Management*, Prepared for the State of Oregon Department of Environmental Quality, October 2014, Table ES-2 at page iii.

³ <https://www.oregister.com/2024/05/04/tech-meets-trash-in-orange-countys-landfill-future/>.

⁴ Id. and <http://methane.jpl.nasa.gov/>

states without diversion targets do not have a competitive advantage over California projects that provide the same reductions and greater benefits overall.

- E. Biofuels (biomethane, electricity, or hydrogen) from diverted organic waste should continue to receive credit for the difference between their avoided methane emissions and the avoided methane emissions achieved by the highest emitting procurement product allowed under CalRecycle's SB 1383 regulations. As noted above, projects that produce both bioenergy and compost provide several times greater carbon reductions than compost only projects, so the LCFS should continue to provide credit for the additional methane reductions that fuels from diverted organic waste provide compared to other alternatives under CalRecycle's regulations.

These corrections to the 45-day language are essential to maintain progress on organic waste diversion and Short-Lived Climate Pollutant reductions.

2. BOOK AND CLAIM SHOULD BE CONSISTENT WITH THE RPS AND SB 1440.

BAC urges the Air Board to go back to the staff recommendations in 2022 and 2023 that would have phased out undelivered biomethane consistent with the RPS and SB 1440. As BAC noted in its February comments on the 45-day language, continued credit for undelivered fuels harms California's climate and air quality goals for several reasons, including:

- Undelivered biomethane does not help California to reduce SLCP emissions.
- Undelivered biomethane means that California vehicles will continue to use fossil gas, contradicting one of two primary goals of the program, which is to reduce fossil fuel use on the road in California.
- Allowing undelivered biomethane puts instate projects at a severe disadvantage since instate production can be significantly more expensive due to stronger environmental, labor, pipeline injection, and other standards.
- Undelivered biomethane does not help to reduce landfilling, pollution from dairies, or wildfire risks, nor does it provide as many jobs and economic development in California.

For all these reasons, BAC urges the Air Board to go back to the staff proposals on the LCFS, which would have phased out undelivered biomethane consistent with the RPS and SB 1440. The 45-day language does not do this in any meaningful way. Projects built before 2030 will never be required to deliver their biomethane to California. And projects built after 2030 do not have to show delivery until 2040 or later and, even then, only have to inject the biomethane into a pipeline that flows in the general direction of California. This is not a clear standard and definitely does not ensure that the

biomethane will help reduce SLCP emissions instate or provide other environmental benefits in California.

BAC supports the use of Book and Claim for biomethane that is both generated and used in California or the western United States, whether it is used offsite as biomethane, for low-CI electricity generation or for hydrogen production. BAC urges the Air Board to clarify in the amendments to the LCFS regulation that book and claim for biomethane converted to low-CI electricity is allowed, provided that both the biomethane and low-CI electricity production are consistent with the RPS. This could be done by adding conversion of biomethane to low-CI electricity in Sections 95488.8(i)(2) and 95488.8(g)(1)(A)(2).

3. CARB Should Identify and Develop New Markets for Biomethane, as Committed to in its Advanced Clean Fleet Resolution.

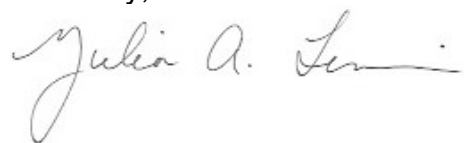
In its April 2023 Resolution on Advanced Clean Fleets, CARB recognized the need to develop new markets for biomethane to move it to hard to electrify end uses. As the Board Resolution stated:

“the Board recognizes that the successful implementation of the food waste diversion requirements and methane emissions reductions mandated by SB 1383 are critical to the State’s climate goals. The Board further recognizes that multiple reliable uses for non-fossil biomethane will be needed for successful implementation . . . As such, the Board directs staff to prioritize policy discussions related to SB 1383 and SB 1440 implementation and discussions on how to transition biomethane into hard to decarbonize sectors, or as a feedstock to produce hydrogen for FCEV fuel and to produce electricity to charge BEVs to achieve the SB 1383 target.”

BAC urges CARB staff to move forward on the development and implementation of new, reliable markets for biomethane as directed by the Board more than a year ago. This is critical to avoid backsliding on the state’s SLCP reductions, which will happen if biomethane is phased out of the transportation sector before new markets are developed. BAC looks forward to working with CARB on this and urges CARB to begin the process immediately.

Thank you for your consideration of these comments.

Sincerely,

A handwritten signature in cursive script, reading "Julia A. Levin".

Julia A. Levin
Executive Director

May 10th, 2024

VIA ELECTRONIC FILING

The Honorable Liane M. Randolph, Chair
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: BTR's Comments on Low Carbon Fuel Standard ("LCFS") April 10, 2024, Workshop

Dear Chair Randolph and California Air Resources Board's Transportation Fuels Branch Staff,

Bridge To Renewables, Inc. (BTR) is pleased to provide comments on potential changes to California's Low Carbon Fuel Standard ("LCFS") program in response to the LCFS Workshop on April 10th, 2024. We appreciate the continued opportunity to engage with Air Resources Board ("ARB") staff during this process. These comments emphasize prior comments we have submitted, most recently on 2/20/2024.¹

Measuring Success

Consistent with those prior comments, we again highlight the extraordinary progress California's LCFS program has made in reducing the carbon intensity of transportation fuels in California.

As ARB itself illustrates on its recently updated [LCFS Data Dashboard](#), on average in 2023 the program achieved a 15.34% CI reduction – over 4% greater than the program's current 2023 target of 11.25%.

The realized reduction in Q4 2023 alone was 17.25%, 6% greater than current 2023 target and a 1.75% increase above the realized reduction in Q3 2023, which itself was roughly 1.25% above the realized reduction in the first half of the year.

Not only is the LCFS program achieving success at a level far above its current targets, but it is doing so at an accelerating rate. This is a measure of success of which both the state and ARB should be proud.

However, the program's continued success is jeopardized by the regulatory delay in amending the program and the uncertainty around whether those amendments will be sufficiently ambitious.

¹ See public comments BTR submitted \ on the Preliminary Staff Report Low Carbon Fuel Standard (LCFS) Amendments, available at: <https://ww2.arb.ca.gov/applications/public-comments>

157.1
cont.

LCFS prices have dropped 25%, to \$48.75/MT, in the 30 days since the April 10th workshop.² That is an echo of the price response after the release of the ISOR, when prices dropped 20%. The market continues to send a clear signal to ARB that without timely and aggressive action, it believes the program's performance will continue to outpace its targets, with the result that the LCFS could be a victim of its own success.

Resetting Carbon Intensity Targets To Ensure Continued Success

The program's outperformance in 2023 led to an 8.2 million build in the credit bank, swelling it to 23.55 million credits, a level sufficient to cover over a years' worth of deficits.³

157.2

If the current rate of realized reduction persists through 2024, by year-end the program will be reducing the carbon intensity of transportation fuels in California by over 20% below 2010 levels.⁴ Put another way, in just seven months' time the program's performance will be in excess of the current 2030 target, further swelling the bank to at least 30 million credits.⁵

This foreseeable prospect starkly highlights the need for a carbon-intensity Step-Down in 2025 significantly larger than the 5% Step-Down ARB proposed in the ISOR. ARB appears to recognize this, and we commend the analysis ARB Staff presented at the April 10th workshop that included Step-Downs of 7% and 9%.

As we have emphasized in our prior comments, the fundamental purpose of the Step-Down is to reset the ambitions of the program ahead of its performance. It is a forward-looking mechanism that responds to the immediate and foreseeable oversupply in the market, and results in an immediate and predictable inflection in the trajectory of the credit bank.

A reversal of the build in the credit bank is a necessary first-step to create a reversal in the credit price towards a level that provides a sufficient and sustained incentive to support continued investment in transportation decarbonization.

Neither a 5% nor a 7% Step-Down will achieve this purpose. They would result in a 2025 CI reduction target of only 18.75% and 20.75% respectively, levels insufficient to reset the ambitions of the program ahead of its foreseeable 2025 performance.

Recommendations:

- Adopt a Carbon Intensity Step-Down of at least 9% below the current 2025 level.

² OPIS Carbon Market Report, May 9th, 2024.

³ <https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/dashboard/quarterlysummary/Q4%202023%20Data%20Summary.pdf>

⁴ *Analyzing Future Low Carbon Fuel Targets in California: Response to Staff Report*, ICF Resources, LLC, February 2024, page 7, available at: <https://ww2.arb.ca.gov/applications/public-comments>; BTR estimates.

⁵ *Ibid.*, page 6; BTR estimates.

157.2
cont.

- This implies a new 2025 CI reduction target of at least 22.75% below the 2010 baseline.
- This creates the most certainty to rebalance the LCFS credit bank, a primary goal of the current rulemaking process and a conclusion supported by the analysis ARB Staff presented at the April 10th workshop.⁶
- This increases the likelihood that the program will avoid any near-term triggering of the AAM which, as ARB noted in that same analysis, could significantly accelerate draws in the bank.⁷
- This aligns with the work conducted by the consulting firm ICF which recommended an optimal step down of 10.5% to 11.5% in 2025.⁸

157.3

- Adopt a 2030 Carbon Intensity target greater than 30%.
 - Greater reductions are achievable and would align with CARB's primary Scoping Plan scenario which targeted a 48% economy-wide reduction in greenhouse gases by 2030.⁹

Accelerating Success

A Step-Down of at least 9% and 2030 target greater than 30% are the most effective means to respond to the immediate and foreseeable oversupply, provide a sufficient and sustained incentive for continued investment, and ensure the program's continued success.

157.4 However, the Automatic Acceleration Mechanism ("AAM") is an important tool to allow the program to adjust more flexibly for unforeseen imbalances in the future.

In the ISOR, ARB proposed that the AAM could not trigger until 2027, which would not impact CI reduction targets until 2028 - three years after ARB's proposed Step-Down in 2025.

We believe that timing is too late and encourage ARB to consider an earlier, modified trigger.

Recommendations:

- Allow the AAM to trigger in 2026, one year after the effective date of the Step-Down in 2025.
- Adjust the bank-to-deficit ratio to between 2.0 and 2.5 from 3.0.

⁶ <https://ww2.arb.ca.gov/sites/default/files/2024-04/LCFS%20April%20Workshop%20Slides.pdf>, page 47.

⁷ Ibid.

⁸ *Analyzing Future Low Carbon Fuel Targets in California: Response to Staff Report*, ICF Resources, LLC, February 2024, page 7, available at: <https://ww2.arb.ca.gov/applications/public-comments>

⁹ <https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf>

Conclusion

157.5

The nearly four-year regulatory amendment process makes it imperative that ARB takes immediate and aggressive action to reset the LCFS program's ambitions ahead of its performance. Additional delays and insufficiently ambitious adjustments to ARB's current proposals will only exacerbate the near-term oversupply and exert additional downward pressure on prices, risking a sharp drop in clean fuels and technologies investment. Such an outcome would impede, rather than build upon, the program's clear success to date.

The transportation sector is the largest sector contributing to greenhouse gas emissions and reducing those emissions is critical to achieving carbon neutrality. We therefore encourage ARB to pursue aggressive policies that support California's climate goals.

157.6

The most effective policies ARB can adopt are to significantly adjust the magnitude of the Step-Down, raise the 2030 carbon-intensity reduction target and adjust the timing and trigger of the Auto Acceleration Mechanism

We thank you again for the opportunity to provide these comments, and we look forward to continued engagement with ARB staff.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jack Barrow', with a stylized, cursive script.

John (Jack) Barrow
Chief Executive Officer
Bridge to Renewables

May 10, 2024

Matthew Botill
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Sevana Bioenergy Comments Regarding the Low Carbon Fuel Standard Workshop April 10, 2024

Dear Mr. Botill:

158.1 Thank you for the opportunity to submit comments on the topics discussed at the Low Carbon Fuel Standard (LCFS) workshop April 10, 2024. We strongly support CARB's rulemaking process. The staff's recent proposed workshop approaches appear well grounded at striking a balance among stakeholders, and we support expeditiously implementing the most ambitious versions of these without further delay.

Sevana Bioenergy develops RNG projects through design, construction, and operations, with strong partnerships and contributions to the local communities we serve. Our mission is to accelerate the production of RNG from anaerobic digestion facilities and contribute significantly to worldwide greenhouse gas reduction with net carbon-negative projects. Unfortunately, we have seen decarbonization projects being cancelled or even defaulting as a result of depressed LCFS credit prices. We continue to support an ambitious LCFS and suggest:

158.2 **Adopt a 2025 or if possible 4Q 2024 "step down" of at least 9%**

As modelled, this is a minimum amount needed in order to begin reducing the excess credit bank.

Strengthen the AAM's mechanics

158.3 First, allow the AAM to take effect in 2026, adjusting the triggering timeframe as needed, since a 9% step down will not alone reduce the excess credit bank until 2027 resulting in continued depressed prices preventing investments in low carbon projects. Secondly, set the triggering threshold when the credit bank is more than 2.0 times greater than the quarterly deficits generated, based on analysis by AJW and others that 3.0 is excessive. Finally, the AAM should allow for the program to trigger continuously (no "freeze" needed between years as currently proposed, or even waiting for a full year to trigger). These minor adjustments to the AAM will ensure it is effective enough to avoid repeat regulatory revisions and give sufficient confidence to market participants to make informed investments and long term commitments.

Consider increasing the 2030 target

158.4 Based on our review and independent runs of the CATS model, we note generally high cost and limited availability assumptions may skew the results to predict too high prices with too few substitutes. In the future, implementing learning curves and Monte Carlo scenarios across ranges of assumptions could provide additional insights for policy making. We support the proposed 30% and potentially recommend the previously modelled 35% target in 2030, as the program has demonstrated it can and will over-achieve its targets.

True-up Temporary Pathway Codes

- 158.5 A true-up remains necessary to properly recognize the true environmental performance of all pathways for Temporary Pathway Code (TPC) time periods. Under industry-standard carbon intensity sliding scale contracts the TPC's worse-than-actual carbon intensity disproportionately shifts economics away from producers during the critical "valley of death" shortly after startup but before provisional pathway revenues are realized.
- 158.6 Furthermore, the penalty for inadvertently overstated carbon intensities during the true-up should be revised to 1.25x rather than 4.0x to penalize but not bankrupt producers that do not achieve carbon intensity modelled with best available information but fall short due to factors outside their control.

Streamline Tier 1 Pathway calculators

- 158.7 We support improvements to the Tier 1 calculators to improve processing timelines and streamline verification currently requiring Tier 2 pathways. We would recommend the Tier 1 DSW model enable entering 0, 1, or more lagoon cleanouts per year based on verified inputs based on historical practices. This best reflects the actual avoided emissions.

Align to be consistent with the latest methane science and SB 1383 definitions

- 158.8 We also support recognizing the latest science finding higher methane emissions are otherwise generated from landfilling organic waste prior to processing in anaerobic digestors. Do not discontinue credit for avoided methane emissions based on "targets" for landfill diversion in 1383 that are not binding legal requirements without alternative mechanisms. The definition of "food scraps" should be corrected to be consistent with
- 158.9 CalRecycle's definition.

Maintain avoided methane and deliverability mechanics

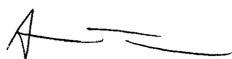
- 158.8 cont. Sevana is developing projects both inside and outside California, with both carbon negative electricity and RNG pathways, so we are familiar with and not biased toward any specific fuel type or geography. Furthermore, RNG can be used to generate hydrogen and other low carbon fuels. The science-based, technology-neutral and inter-state commerce compliant framework of the LCFS make it a strong and tested policy.

We recommend CARB maintain or extend the timeframes in the ISOR for eligibility of avoided methane deliverability. These mechanisms are supported by science and aligned with programs such as the RFS and other state LCFS. This will avoid tremendous risk of legal challenges, fuel shortages, higher emissions through workarounds such as trucking rather than pipeline deliveries, and perpetuating the sustained usage of fossil fuels by arbitrarily hindering low carbon fuels.

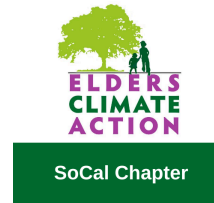
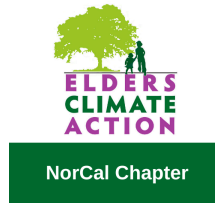
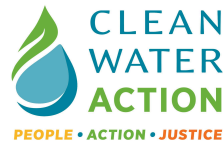
Methane is one of the most powerful greenhouse gases with a potency nearly 30 times that of carbon dioxide. RNG projects capture methane including from livestock and organic waste that would otherwise be released to the atmosphere and thus reduce greenhouse gas emissions and improve air quality. California should employ all options available to help mitigate methane emissions.

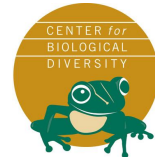
We look forward to moving forward rapidly into final rulemaking.

Sincerely,



Steve Compton
President & COO
Sevana Bioenergy





May 10, 2024

Re: Low Carbon Fuel Standard – We Need You to Stand Strong for Environmental Justice, Clean Air and a Stable Climate.

Dear Chair Randolph and Members of the Board:

159.1 We write as public interest groups across the country to ask the California Air Resources Board (CARB) to do the right thing when it comes to the Low Carbon Fuel Standard (LCFS). Environmental justice, labor union, and social justice colleagues in California have sounded the alarm bell that this program harms people across the State, from the fenceline of factory farms to the residents living in the shadows of refineries. In fact, the program has incentivized harm in similar rural and urban communities across the country. The program amendments proposed by CARB staff extend to 2045, so this rulemaking is critical to send the right investment and policy signals for decades to come.

159.2 Unfortunately, the current proposal will continue to drive investment toward false climate solutions that perpetuate environmental injustice across the country and undermine CARB's efforts to transform our transportation system toward truly zero-emissions solutions. Furthermore, we are disturbed that CARB staff appear to be moving away from including intrastate jet fuel in the LCFS instead of expanding the scope of coverage to include interstate and international flights. We need the Board to do what California groups have called for, which is to Fix the LCFS.

The Board's guiding light should be to use the LCFS to support the advancements that make CARB a world leader in air and climate action. Doing so means:

- 159.3 • Ending lavish incentives to factory farms across the country to produce methane and factory farm gas that California does not need. Not only is methane-producing liquified manure management a choice but also CARB has an obligation to regulate that methane rather than subsidize its creation.
- 159.4 • Capping the unfettered rise of biofuels, which pose grave risks to our climate and ecosystems, and which are driving a glut of credits that is weighing down the program.
- 159.5 • Enhancing support for truly zero-emissions solutions, like electric school and transit buses, that deliver multiple long-term benefits, like VMT and air pollution reductions.
- 159.6 • Not relying on offset projects like direct air capture and factory farm gas to decarbonize the transportation sector, as this is a way for the oil industry to justify its continued operations and pollution in communities. These projects will perpetuate the oil industry's environmental racism in communities across the country.

159.7 We need the Board and the Governor of California to understand that this program impacts many people in California and beyond. For those of us outside of California, we see polluting projects in our communities justified because California's LCFS is sending the wrong investment signals. And we fear more will come down the line. CARB Staff's proposal does not align with what the Board has voted on through other regulations.

We recognize that policy reform can be hard when it requires standing up against incumbent industries like the oil industry, the methane industry, and big agricultural interests. But we ask you to place the health of communities and the climate ahead of these powerful and entrenched interests and fix the LCFS.

Sincerely,

Román Partida-López
Senior Legal Counsel for Transportation Equity
The Greenlining Institute

Teresa Bui
Climate Policy Director
Pacific Environment

Marven Norman
Policy Coordinator
Center for Community Action and Environmental Justice

Dashel Murawski
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Christina Scaringe
California Climate Policy Director
Center for Biological Diversity

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Defensores del Valle Central para el Aire y Agua Limpio

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Sunflower Alliance

Tracy Carluccio
Deputy Director
Delaware Riverkeeper Network

Daniel Chandler
Steering Committee
350 Humboldt

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Don't Gas the Meadowlands Coalition

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Long Island Progressive Coalition

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Amelia Keyes
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Communities for a Better Environment

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Gracyna Mohabir
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Animal Legal Defense Fund

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Lauren Jacobs
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Duwamish River Community Coalition

Catherine Garoupa
Executive Director
Central Valley Air Quality Coalition

Jesse N Marquez
Executive Director
Coalition For A Safe Environment

Sherri Dugger
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Patty Lovera
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Adrian Martinez
Deputy Managing Attorney
Earthjustice

Lucas Zucker
Co-Executive Director
Central Coast Alliance United for a Sustainable Economy (CAUSE)

Linda Rudolph
Senior Policy Advisor
Center for Climate Change and Health

CC: Governor Newsom



The Honorable Liane Randolph
Chair, California Air Resources Board
1001 I St, Sacramento, CA 95814
Sacramento, California 95814

May 10, 2024

RE: Potential Changes to the Low Carbon Fuel Standard

Dear Chair Randolph and Members of the Board:

I write on behalf of Clean Energy to emphasize our support for many of the proposed amendments to the Low Carbon Fuel Standard (LCFS) in the “Initial Statement of Reasons (ISOR)” and urge adoption of several additional amendments that will allow the state of California to effectively achieve its climate and clean air goals. The comments herein are in response to the staff workshop presentation on the LCFS held on April 10th.

The LCFS has displaced over 25 billion gallons of petroleum, reduced the carbon intensity (CI) of fuels sold in California by 12.5%, and resulted in approximately \$4 billion of annual low carbon investments. It is recognized as one of the most effective climate policies across the globe and is being replicated in other states and provincial governments. These successes, and the adoption of cleaner technologies to produce lower carbon transportation fuels should be celebrated, but it is no time to slow down and be less ambitious.

The program’s success has also resulted in a massive surplus of LCFS credits, largely in part due to widespread adoption of renewable diesel which is driving down prices and stalling new project investments that would capture avoided methane emissions and support zero emission strategies. California needs billions of dollars of investment to implement the California Air Resources Board’s (CARB’s) *2022 Scoping Plan for Achieving Carbon Neutrality* in the transportation sector. Low carbon projects, like renewable natural gas (RNG) facilities that capture methane at landfills, wastewater treatment facilities, and livestock farms, rely on LCFS revenues to be financed, built, and operated, and these projects are unable to be developed without a robust LCFS program.

As CARB staff indicated in the April workshop, the vast majority of all market participants are asking for more stringency in the program and an aggressive LCFS curve. We support the science-based analysis presented by CARB and urge you to please consider adopting the following amendments:

- 160.1
- **A 9% step-down in the compliance curve in 2025:** there are over 25 million credits in the LCFS bank and growing. To support a more ambitious program, CARB needs to adopt the

9% step-down in 2025 modeled by staff. Industry has provided analytics justifying an even more aggressive step-down in 2025, so the 9% step-down is the minimum that should be done. Without it, the credit bank will not reduce fast enough and we will be stuck in a depressed LCFS price environment.

- **Auto-Acceleration Mechanism (AAM):** allow the AAM tool to be used annually starting in 2025 if data confirms that the credit bank drawdown is occurring too slow (i.e., the credit build is 2.5 times larger than the credit draw in any given quarter). This mechanism would dynamically respond to a potential future event where there is a significant underestimation of CI reductions in a given year. A more stringent and necessary target would be established to help: (A) avoid large credit bank builds, (B) push credit prices up that are currently at an all-time low of \$48.75; and (C) help deter some low carbon fuel producers from converting facilities back to fossil fuel production as we are witnessing at one facility in Mobile, Alabama¹.

- **Compliance Curve:** we urge CARB to set an ambitious compliance curve course with a minimum 9% step-down that immediately draws down the credit bank and ensures a steady market to 2030. ICF forecasts that the program will have a bank of about 29-30 million credits by the end of 2024² and suggests that the currently proposed CI step-down of 5% will slow the bank build by about 50% compared to previous years. However, the credit bank is still likely to grow by nearly 4 million credits by the end of 2025 and therefore a CI reduction of 25% in 2025 is likely needed to ensure that the credit bank reverses and is drawn down to a level that is in line with a credit bank of only two quarters' worth of deficits.

This level of stringency, while seemingly high, is likely what is needed to achieve CARB's stated intent of correcting for the "near-term over-performance" of the program."³ We are also supportive of at least a 35% CI reduction target by 2030. Our industry's extensive quantitative modeling⁴ concludes that implementing a 41% CI reduction would increase the current approximate \$52 credit price to \$100-\$120 by the end of 2025 and maintain at least that price through 2030, thereby sufficiently supporting investment.

The primary reason for the substantial surplus in credits is the increasing supply of renewable diesel, which EIA forecasts to top 6 billion gallons by 2026. Several in-state projects are projecting to operate at full capacity by year-end and additional projects are coming online. This is positive as it displaces fossil diesel supply, but without a compliance curve change and more stringency in the program, the credit bank will continue to increase, prices will remain low, and the LCFS program will effectively be a refiner's program.

¹ "Vertex Energy to 'Pause' Renewable Diesel Production at Alabama Refinery – OPIS," May 9, 2024, [Vertex Energy to 'Pause' Renewable Diesel Production at Alabama Refinery – OPIS - MarketWatch](#)

² "Analyzing Future Low Carbon Fuel Targets in California; Response to Staff Report," Page 3, ICF, February 2024

³ "Analyzing Future Low Carbon Fuel Targets in California; Response to Staff Report," Page 4, ICF, February 2024

⁴ "Analyzing Future Low Carbon Fuel Targets in California; Initial Results for Accelerated Decarbonization, Central Case," ICF, June 2023

The oversupply of credits in the market hurts existing project returns, limits new project development, and sends the wrong signal to investors. In fact, based on spot and futures markets, Wall Street believes California has lost its urgency to decarbonize transportation and the market has not reacted favorably to each proposal released thus far during the LCFS update public process. Investment banks are viewing and buying credits as distressed assets rather than proactively investing in low carbon projects that move California closer to its climate and clean air goals.

- 160.4 • **Pathway CI True-up:** this remains necessary to properly recognize the true environmental performance of all pathways. The certification of pathway approvals can take anywhere from 18 to 22 months which places a significant financial hardship on a project and those in the entire value chain. A project should be able to apply its actual CI performance retroactively to the start of a project. The project would be eligible to claim the full benefit of its project CI even when starting with the temporary pathway (also known as the project start up period).
- 160.5 • **Increased Pathway Processing Times:** we encourage CARB to move dairy and livestock sector projects from Tier 2 to Tier 1 pathways immediately so that all RNG projects are processed under a more time efficient process. Currently, a Tier 2 dairy pathway takes 18-21 months to receive approval of its Provisional CI pathway application. These capital intensive projects are left to generate credits based on a -150 CI Temporary Pathway (default) while waiting for approval, resulting in hundreds of thousands of dollars of revenue loss and lower project returns. Incrementally, the state is unable to recognize the true CI benefit of the project because it is being recognized at a default CI vs the actual project CI. As outlined in the LCFS regulation, this process is supposed to take approximately 6 months.
- 160.6 • **Remove Fixed-year Phase-out of Avoided Methane Crediting:** removing this from the proposed rule would prevent any dramatic reduction in LCFS market value that enables methane capture and beneficial use projects. Without that revenue stream and market certainty, projects such as dairy digesters will not be able to be financed or implemented post-2030. The development of dairy digesters is widely recognized by the California Air Resources Board⁵ and the Legislative Analyst Office⁶ as the most productive and cost-effective climate investment currently being implemented. Without avoided methane crediting under the LCFS, new projects will not be developed, and existing projects will not remain economical and will cease operating.
- 160.7 • **Four-To-One CI Penalty:** we do not recommend CARB adopt a penalty mechanism for CI changes at a project. Projects are biological in nature and can experience changes in CI due to many factors, including but not limited to, ambient temperature, energy input increases and/or decreases, cloud cover, etc. When these types of natural changes occur, the operator of the low carbon project, like an anaerobic digester, will properly manage the fluctuating

⁵ California Air Resources Board, *California Climate Investments 2022 Mid-Year Data Update*, https://ww2.arb.ca.gov/sites/default/files/auction-proceeds/ci_2022_mydu_cumulativeoutcomes.pdf (page 4).

⁶ Legislative Analyst Office, *Cap-and-Trade Spending Overview*, March 30, 2023.

<https://sbud.senate.ca.gov/sites/sbud.senate.ca.gov/files/230238LAO%20Cap%20and%20Trade.pdf>

160.7
cont.

project CI and credits being generated. In the event the CI changes unfavorably resulting in an over-generation of credits, normal course of operations is to bank these credits for retirement through the Annual Fuel Pathway Reporting (AFPR) process.

Unfortunately, the proposed regulation will apply a four-to-one penalty to the CI if it moves unfavorably to the credit generating CI. Because of this, an operator will be forced to apply a very conservative margin of safety to the CI of their project, thus reducing its quarterly revenues. As it stands today, the pathway approval process takes nearly two years to complete, resulting in lower revenues at the beginning of a project and now you will also see lower revenues during a project while it goes through the AFPR process, which can take up to two years. This proposed change will not provide any CI emissions benefit to the program and puts additional financial strain on low carbon investments.

The success of the LCFS is due to ambitious state goals and targets, backed by science-based, fuel neutral policies, along with a broad portfolio of clean fuel stakeholders working together to decarbonize California's transportation sector. The LCFS needs to double-down on its aggressive state goals by being more stringent and continuing to reward projects based GHG outcomes. Remaining true to these core concepts will ensure California leads the world in rapid transportation sector decarbonization.

Sincerely,



Todd R. Campbell
Vice President, Public Policy & Regulatory Affairs
Clean Energy



May 10, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: ChargePoint Comments on Proposed Verification of EV Charging Under the LCFS

Thank you for the opportunity to submit comments on the proposed amendments to the Low Carbon Fuel Standard (LCFS) issued on December 19, 2023 and expanded upon in the April 10 workshop.

About ChargePoint

Since 2007, ChargePoint has been committed to making it easy for businesses and drivers to go electric with one of the largest electric vehicle (EV) charging networks and a comprehensive portfolio of charging solutions. ChargePoint's cloud subscription platform and software defined charging hardware is designed internally and includes options for every charging scenario from home and multifamily to workplace, parking, hospitality, retail, corridor, and fleets of all kinds.

Summary of comments

- 161.1 • CARB should leverage the existing CTEP certification program and Division of Measurement Standards (DMS) regulations for EVSE under the LCFS verification program to establish and ensure EVSE accuracy. The accuracy and load test tolerance requirements under CTEP are more stringent than MRR and these are well established industry standards that the EVSE industry is already moving towards.
- 161.2 • Verifying the accuracy of an EV charging station and embedded meter (together henceforth referred to as "EVSE") based on that EVSE's use case (i.e., whether that EVSE financially charges for charging or not) will unnecessarily penalize EVSE that do not financially charge for charging because internal meters, as defined by the Mandatory Greenhouse Gas Regulation (MRR), face additional calibration requirements which will add significant cost. The accuracy of EVSE does not depend on whether or not that EVSE financially charges for charging.
- 161.3 • The calibration requirements, as proposed by MRR for EVSE deemed as "internal meters", are problematic for tens of thousands of EVSE across California. ChargePoint's EVSE meters themselves are sealed and unalterable once they leave the factory, rendering them impossible (and unnecessary) to calibrate in the field. If CARB moves forward with the proposed calibration requirements, it may result in the disqualification of tens of thousands of EV charging stations from the LCFS program and/or levy significant new administrative cost on the industry, quite possibly to the point where reporting entities drop out of the program altogether.

Verification of EV Charging Stations, Assumed Meter Accuracy, and Calibration

If CARB believes that on-road electricity reports must undergo third-party verification under the amended regulation due to largescale risk of misreporting, CARB should lean on existing standards and regulations when designing verification so as not to “reinvent the wheel”. The charging industry has worked hard over the years with various federal and state (including California) standards-setting bodies and agencies to come together around an industry standard governing meter accuracy and consumer protection that is robust, effective, and scalable.

There is an existing framework to assess and verify EV charger accuracy established in California. The Division of Measurement Standards (DMS) under the California Department of Food and Agriculture enforces the accuracy of commercial weighing and measuring devices. Since 2019, DMS regulations have adopted sections of the National Institute of Standards and Technology (NIST) Handbook 44, which specifies the accuracy requirements, testing procedures, and other specifications that charging equipment must meet to be used for a commercial purpose in California.¹ These standards are codified in the California Code of Regulations (CCR) under Title 4, Division 9.²

DMS requires that chargers used for a commercial purpose receive California Type Evaluation Program (CTEP) certification. CTEP is essentially certification that an EVSE make and model has demonstrated the specifications established by NIST Handbook 44 and adopted by DMS. CTEP mandates Accuracy Class 2.0 for alternating current (AC) Level 2 charging, and Accuracy Class 5.0 for direct current fast charging (DCFC). Class 2.0 means an accuracy threshold of +/- 1% off the manufacturing line and 2% in the field; Class 5.0 means an accuracy threshold of 2.5% off the manufacturing line and 5% in the field. CTEP also requires accuracy testing at various loads (referred to as “load test tolerances”). *Note that these accuracy requirements are stricter than those listed in MRR (+/- 5%) thus would result in more accurate reporting under the LCFS, if adopted.* ChargePoint is proud of our leadership to be one of the first manufacturers to receive CTEP certification in California.

CARB’s proposal to draw on the MRR regulations to define how EVSE meters must be verified ignores this work and does not acknowledge the differences between EV charging and conventional liquid and gaseous fueling. First, there are many use cases in EV charging where the EVSE operator does not financially charge for charging. Common use cases include multifamily charging, where property owners/developers will offer free EV charging to tenants as an added benefit, and dedicated fleet charging. Fleets typically don’t charge their own drivers to charge their vehicles since the infrastructure and vehicles are typically owned and operated by the same entity (and the drivers are employed by that same entity). Retail charging is another common example whereby retail store owners may offer customers free charging to encourage more customers to visit their stores. Under CARB’s current verification proposal, these EVSE would be

¹ NIST Handbook 44 establishes the standards for Electric Vehicle Fueling Systems in Section 3.40. Handbook 44 is available at: <https://www.nist.gov/publications/specifications-tolerances-and-other-technical-requirements-weighing-and-measuring-15>

² A summary of the DMS regulations related to EVSE is available at: https://www.cdfa.ca.gov/dms/pdfs/CA_EVSE_Regulation_Reference_Document.pdf



treated as internal meters which must meet additional calibration requirements to participate in the LCFS program. Which brings us to the second critical difference between EV charging meters and conventional liquid and gaseous fuel meters.

161.4
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The MRR regulations require that internal meters are calibrated on a regular basis, which may be at the manufacturers' recommended frequency but regardless must happen at least every five years. This requirement presents a significant challenge for charging devices that do not qualify as financial transaction meters, such as fleet chargers or chargers dispensing electricity for free, because many charging stations models are not able to be calibrated.

ChargePoint, a manufacturer of EV charging station hardware and software, calibrates each device's meter in the factory. Calibration is achieved using special firmware on the device, which is deleted entirely from the device after calibration is complete. This process is done such that the embedded meters used in ChargePoint devices are unalterable. This approach is consistent with NIST Handbook 44 and DMS regulations, which does not set specifications for charging stations to be recalibrated. While ChargePoint cannot speak to the manufacturing processes of other EVSE manufacturers, it is our understanding that it is relatively common across the industry for devices not to allow for calibration or alterability in the field. This is a strategy both to reduce the cost of charger maintenance and to prevent tampering. While the regulations and standards governing EVSE device accuracy are relatively nascent, we are confident that our process results in accurate devices. This process for calibration and accuracy is consistently applied to all ChargePoint products regardless of whether the charger is used to facilitate financial transactions or not.

ChargePoint is concerned that the requirement for internal meters to be calibrated sets an impossible standard for many devices that will be classified as "internal meters" by the MRR regulation to meet. We believe the negative impact of trying to squeeze charging stations into the existing MRR framework will be significant on business and customers, especially fleet chargers. We also expect that if unaddressed, this issue will create implementation difficulty for CARB and/or third-party verifiers, which may lead to a significant disruption in the LCFS program.

If CARB implements the verification rules as proposed that reference MRR, this could result in the disqualification of tens of thousands of EV charging stations from the LCFS program and/or significant additional verification costs on the industry.

ChargePoint Proposal

161.5

In addition to allowing reporting entities to prove accuracy via meeting the definition of a 'financial' meter or an 'internal' meter under MRR, CARB should allow reporting entities to demonstrate accuracy of EVSE via CTEP certification. As detailed above, CTEP's accuracy and load test tolerance requirements are more stringent than MRR and therefore would ensure accurate reporting under the LCFS (even more accurate than CARB is currently requiring under MRR). Additionally, for reasons stated above, the EV charging industry is already galvanizing around

161.4
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CTEP so were CARB to leverage CTEP certification under the LCFS it would lower administrative costs on the industry. The CTEP certification is based on NIST Handbook 44, so CARB should accept CTEP as it provides NIST-level assurance that the EVSE meter is accurate.

The use case of the charging station (financial meter vs internal meter, as defined under MRR) does not impact meter accuracy. EVSE OEMs sell the same EVSE make/model into multiple use cases, so verifying meter accuracy based on the use case does not make sense. By demonstrating that an EVSE make/model has achieved CTEP certification ensures that that EVSE is technically accurate, which is what matters most for accuracy. To be clear, for EVSE make/models that are not CTEP certified, our proposal is not that these make/models would be ineligible under the LCFS; the reporting entities may still verify accuracy via the 'financial' or 'internal' meter frameworks.

161.4
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Conclusion

ChargePoint would welcome the opportunity to meet with the CARB team to further discuss this issue or provide additional written comments/clarifications as needed. We urge the CARB team to consider the importance of designing an LCFS verification scheme that is workable for the charging industry: in 2023, there have been nearly 1.5 million credits issued for non-residential EV charging under the program, and this number is rapidly increasing. If verification is not feasible for the industry, it could strand a significant % of these credits and hamstring the industry going forward at a time when this segment is critical to achieving California's long-term decarbonization goals.

Respectfully,

Evan Neyland
Senior Manager, Carbon Markets



To: California Air Resources Board

Date: May 7, 2024

RE: LCFS Workshop April 10, 2024

Terraform Industries appreciates the opportunity to comment on the California Air Resources Board (CARB)'s Low Carbon Fuel Standard (LCFS) workshop on April 10, 2024. Terraform Industries uses alkaline electrolyzers, direct air capture, and chemical reactors to produce low-carbon methane. This renewable power-to-gas technology produces a carbon-neutral drop-in successor to conventional fossil fuel drilling. Below are Terraform's comments on low carbon intensity hydrogen and alternative fuels.

Renewable/Low Carbon Intensity Hydrogen & Hydrogen as a Feedstock

162.1

Terraform agrees with both the 2022 Scoping Plan Update and CARB's LCFS ISOR which highlight the need for low-carbon hydrogen. Terraform is also in concurrence with the ISOR's proposal that indirect accounting, the expanding of book-and-claim provisions, should be allowed for low-carbon hydrogen to increase the flexibility of hydrogen end uses.

Terraform particularly agrees that low-CI hydrogen should be used as a feedstock in addition to a primary fuel. A compelling use case of low-CI hydrogen is in the production of other low-carbon transportation fuels, such as renewable diesel and e-natural gas. Studies have shown that up to 12% of hydrogen's energy content can be lost when compressing to required pressures for storage and transport.¹ Hydrocarbons are a durable and transportable energy carrier; producing methane, for example, from low-CI hydrogen retains the majority of hydrogen's combustion energy. The ubiquitous production, storage, transportation, and end uses for methane decrease the friction of transitioning away from fossil fuels. In addition, a recent IEA report revealed that novel hydrogen applications in heavy industry and transport accounted for less than 0.1% of the global demand.² Therefore, the use of alternative fuels as a renewable hydrogen carrier has the potential to accelerate hydrogen demand and create a more stable hydrogen economy.

Innovative Alternative Fuels

162.2

In alignment with Jordan Ramalingam's presentation on the LCFS support for California's climate, air quality, and zero-emission vehicle goals, Terraform agrees that LCFS should incentivize *both* ZEV and alternative fuel adoption. While Terraform supports the advancement of ZEVs and direct electrification in the fight against poor air

¹ <https://doi.org/10.3389/fenrg.2020.570112>

² <https://www.iea.org/reports/tracking-clean-energy-progress-2023>

quality and climate change, LCFS should not play a zero-sum game and pick and choose technology “winners.” To meet the LCFS goals of adding competition to fossil fuels while not increasing retail fuel costs, we need to increase the incentives for innovative fuel development. Innovative alternative fuels, such as Terraform’s e-natural gas, are drop-in replacements for their petroleum counterparts. Therefore, alternative fuels leverage trillions of dollars worth of existing industrial infrastructure—without additional capital investments nor land use concerns—to quickly decrease costs, giving clean fuels the fighting chance to economically compete with fossil fuels.

Terraform Industries appreciates the opportunity to provide comments. Further questions and correspondence can be directed towards Tiana Wong at tiana.wong@terraformindustries.com.



9 May, 2024

State of California, Air Resources Board
Industrial Strategies Division, Transportation Fuels Branch
California Air Resources Board
1001 I St.
Sacramento CA, 95814

Re: Comments on April 10, 2024 Workshop

Dear LCFS Staff:

Thank you for the opportunity to comment on the current rulemaking to amend the Low Carbon Fuel Standard (LCFS). The University of California, Davis Institute of Transportation Studies, and the Policy Institute for Energy, Environment, and the Economy have been engaged in research, policy analysis, and technical assistance relating to the LCFS since it was first developed, over 15 years ago. Since then, it has become a critical part of California's climate policy portfolio and a model that has been adopted in many other jurisdictions around the world. Following the strategic vision laid out in the 2022 Scoping Plan, the LCFS would continue to support profound changes in California's transportation and energy systems in order to meet the statutory goals of a 40% reduction in greenhouse gas (GHG) below 1990 levels by 2030, and carbon neutrality by 2045.¹

California's progress toward its climate policy goals stands at a critical inflection point in 2024. Our policies have helped bring many critical low-carbon technologies onto the market at massive scale, and often lower cost than initially projected. Wind and solar power, lithium-ion batteries, and electric vehicles (EVs) have emerged as invaluable tools in the struggle to limit climate change, in large part because of California's forward-looking policies. While it is perfectly appropriate to recognize these successes, we must not assume that simply staying the course will achieve our long-term goals. As technologies, markets, and consumer behavior evolve, so must policies evolve with them. The process of converting a fossil-fuel dominated energy system to a low-carbon renewable one will not follow a simple, consistent path. There will be twists and turns along the way, and as policies begin to transform our energy and transportation system, we must critically re-evaluate existing policies, analyses, and the assumptions that underpin them to be certain that our state is course towards an efficient and equitable transition.

This is certainly true in the case of the LCFS. The LCFS has successfully guided the evolution of California's transportation fuels for almost 15 years, supporting the deployment of low-carbon

¹ SB 32 ([Pavley, Chapter 249, Statutes of 2016](#)), AB 1279 ([Muratsuchi, Chapter 337, Statutes of 2022](#))



POLICY INSTITUTE FOR ENERGY, ENVIRONMENT, AND THE ECONOMY

biofuels, electric vehicles, and other advanced technologies. To date, the LCFS has displaced over 25 billion gallons of petroleum fuels with lower-carbon alternatives, and achieved a 12.6% reduction in carbon intensity of our fuel portfolio. These successes deserve recognition and should not be taken for granted. At the same time, we should not take for granted that critical policies like the LCFS will maintain their effectiveness without continuous, science-based updates. The 2024 LCFS rulemaking is among the first opportunities for reflection and review of existing tools, so that California can continue to be a model of effective climate policies..

We commend Staff for facilitating a robust series of workshops over the last two years, and for their willingness to engage with stakeholders on this complex issue. These comments are presented in the spirit of UC Davis' and the Policy Institute's mission to bring science into the policy process. Neither UC Davis nor the Policy Institute seek a specific policy outcome; these comments are offered to help California meet its climate, environmental, and equity goals. We focus the majority of these comments on two main topic areas: Market modeling and compliance trajectories, as well as Feedstock Sustainability and Indirect Land Use Change.

Market Modeling and Compliance Trajectories

At the April 10th workshop, Staff presented updated CATS modeling showing the results of several new scenario analyses, and updates to input data. Our own FPSM modeling confirms many of the key points from the workshop: EVs will generate the majority of LCFS credits by 2030, and most crop-based biofuels will cease to be credit-generating fuels by the early- to mid-2030's.²

Recent LCFS program data have indicated that the pace of credit bank accumulation continues to increase, with almost 3 million additional credits added to the aggregate bank in Q4 of 2023. This is the largest quarterly aggregate bank increase in the program's history, over 700,000 more than the previous record, set in Q3 of 2023. The total bank now exceeds the total number of deficits generated in 2023, and is clearly indicative of a significant oversupply of compliance credit relative to regulatory obligations. Our own modeling projects that this growth trend will continue, due to the rapid expansion of renewable diesel (RD) production capacity in the U.S. which could supply virtually all additional compliance credit required under higher targets for the next several years at least.³ We have discussed, in our published reports as well as previous

² It should be noted however, that even once these fuels cease to generate credits, they will generate significantly fewer deficits than petroleum. The sum of credits plus avoided deficits between petroleum and biofuels will remain the same, even when biofuels generate no credits.

³ **Initial report:** Ro, J., Murphy, C. W., & Wang, Q. (2023). Fuel Portfolio Scenario Modeling (FPSM) of 2030 and 2035 Low Carbon Fuel Standard Targets in California. *UC Office of the President: University of California Institute of Transportation Studies*. <http://dx.doi.org/10.7922/G2S46Q8C> Retrieved from <https://escholarship.org/uc/item/6f2284rg>



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LCFS comments, why higher targets alone are unlikely to resolve the underlying structural imbalance in the market caused by the unprecedented expansion of RD production capacity, and showed why a restriction on the ability of RD to enter the market, such as a cap on volumes of fuels from specified types of feedstock, appears to be the most viable path among alternatives aired thus far by CARB to push the market quickly toward credit balance.

163.1

Reviewing the CATS Modeling Framework and Results

Many of the CATS model outputs align with those from FPSM, however the models vary greatly in how they project future consumption of RD; understanding the mechanisms behind these differences can help explain why CATS is structurally predisposed to forecasts of lower RD growth than FPSM.

CATS is an optimization model that develops feedstock supply curves for various fuels by a mix of regression analysis and use of other literature. For lipids, earlier technical documentation from CARB indicated supply curves are derived from historical trends in feedstock quantities and wholesale biodiesel prices, using regression analysis to estimate a relationship used to indicate price responsiveness – i.e., feedstock supply curves – in the model. This regression uses a simplified model, with fuel price (along with constant and error terms) associated with lipid supply levels. According to the recent staff presentation, the updated model accounts for time trends in feedstock supply and aligns timeframes in analysis for the different types of oils (residual oils and vegetable oils). While this approach provides an association between quantities supplied and price, its use requires care in interpretation of the outputs.⁴ Because demand constitutes another key quantity/price relationship, use of just price and quantity might not definitively identify the supply relationship, absent other statistical methods to control for this key endogeneity. Nor does the estimation control for other factors that may influence biomass-based diesel (renewable diesel as well as biodiesel) price and resulting lipid supply as fuel feedstock, such as those noted on slide 54 from the April 10th workshop. Given what we know about how agricultural commodities markets function, however, it is unlikely that biofuel price is the only variable with significant explanatory power over the supply of biofuel feedstock in U.S. commodities markets.⁵ Effectively mapping the supply curve with higher fidelity to

2024 update: Murphy, C., & Ro, J. (2024). Updated Fuel Portfolio Scenario Modeling to Inform 2024 Low Carbon Fuel Standard Rulemaking. *UC Davis: Policy Institute for Energy, Environment, and the Economy*. <http://dx.doi.org/10.7922/G25719BV> <https://escholarship.org/uc/item/5wf035p8>

⁴ The limitations on fuel market data are observed and discussed in Mazzone, *et al.* (2022) <https://escholarship.org/uc/item/7vx4c5wr>

⁵ It is entirely possible that no data were available to allow exploration of other model specifications, or that full analysis of other functional forms would have increased the complexity of the econometric modeling beyond what was tractable for CARB staff at the time. We merely observe that only a single explanatory variable appears to have been examined and only a single functional form of the modeled relationship is discussed in the CATS documentation. These factors should be considered when interpreting the results from the model.



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real-world behavior would require either a structural approach with a more complicated set of equations and explanatory variables, or some exogenous source of variation in the demand for lipids. As CATS had neither, the supply curves it uses are best viewed as highly approximate and heavily abstracted correlations, which may not accurately represent future market behavior.

Perhaps even more fundamentally, given large, and largely unprecedented, shifts in the lipids markets for biofuels under policy accompanying the renewable diesel boom, historical supply relationships may provide less of an indicator of future responsiveness to price than they would in a more stable situation. While all data describing a relationship are, by necessity historical, the difficulties in identifying supply curves and the fast-changing nature of the lipid markets for biofuels indicate caution in interpretation. These projections of feedstock supply to fuel price are highly uncertain and may not reflect future behavior. Additionally, the conversion costs represented in the historical dataset reflect the earliest entrants onto the market; these are likely to have higher conversion costs and lower yields due to technological immaturity and the higher capital costs and risk premiums associated with newly-emerged technologies. As a result, CATS analysis may overstate the costs, and underestimate future RD growth. The CATS output for the proposed 5% step-down scenario forecasts a nearly 16% reduction in RD consumption between 2023 and 2024, an outcome that appears highly unlikely given preliminary data on fuel consumption trends in early 2024. Even the more aggressive step-down scenarios project RD consumption to reach a high point in 2024 and decline gradually thereafter, despite continued use of petroleum diesel and generally strong projected LCFS credit prices.

This counterintuitive behavior is, in part, an artifact of how CATS performs its least-cost optimization to set the portfolio of fuels for compliance in a given year. CATS assembles the least-cost portfolio that provides enough credit to match the total amount of deficit generation in a given year; credit banking does not occur except in extraordinary circumstances, such as when prices are zero or at the statutory ceiling. The model therefore assumes that obligated parties and fuel producers will produce precisely enough credit for yearly compliance, but no more. In practice, however, credit banking is a significant phenomenon in the LCFS and an important part of how the market hedges against future market volatility and finds the lowest cost compliance options. The last two years of LCFS performance clearly establish the fact that market participants will over-produce credit-generating fuels, relative to total annual deficit obligations, and bank surplus credits for future years. CATS design cannot represent the behavior that has dominated the LCFS market over the last 2-3 years, and is therefore likely to underestimate future RD consumption in California. Given that this behavior is probably an artifact of CATS' structure, caution must be exercised when using CATS outputs to guide policy decisions.

We want to be clear that these critiques of CATS reflect the difficulties in modeling this space with current data, and under time pressure. LCFS modeling is complex, critical data are scarce and unreliable, and the system is beset by numerous compounding factors. CATS adopts



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163.2
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understandable modeling principles given constraints and makes its assumptions transparent through the public documentation. Our critiques are meant to highlight that care must be taken when using quantitative outputs from CATS as policy guidance, and as with any model, the limitations of the modeling methodology must be considered alongside any outputs.

Higher Step-Downs Will Not Address the Core Market Imbalance

At the April 10th workshop, Staff presented scenarios that analyzed target increases taking effect Jan 1, 2025 that were 5%, 7%, and 9% higher than 2024 (this large one-time target increase is often referred to as a “step-down”). The aggregate credit generation through 2046 is presented for these scenarios on slide 47. FPSM modeling generally aligns with the bank drawdown results; we predict a net drawdown of around 8 million credits through 2035 for the 7% step-down as compared to the 5% one, and an additional 7 million credits for the 9% step-down as compared to the 7%. These results are quite similar, when accounting for the different temporal scope of each model.

163.3

While these larger step-downs do reduce the size of the net bank of credits in 2030 and beyond, that reduction is unlikely to significantly impact the long-term balance of credits and deficits in the LCFS, and is therefore unlikely to significantly affect credit price. While CATS does not explicitly model the size of the credit bank, FPSM does, and the scenarios we published in February project a bank of over 60 million credits in 2030, compared to 35 million deficits under a 30% target. If the automatic acceleration mechanism (AAM) as described in the current amendments is triggered - and FPSM modeling indicates that is the most likely outcome if these amendments are adopted as-is, the bank will remain nearly the same size, but 45 million deficits will be generated in 2030. Under these conditions, reducing the bank by 15 million credits - approximately the difference between the 5% and 9% step-down rates - still leaves the credit bank significantly above the threshold for triggering additional AAM events in the future. Given the current market dynamics, a higher step-down is therefore unlikely to significantly shift the balance of credits and deficits through 2030. While we would anticipate the higher deficit generation from a larger step-down to increase aggregate demand for LCFS credits, renewable diesel will continue to set the marginal cost of compliance under the LCFS, which suggests that a larger step-down is likely to have little impact on credit prices over the next few years.

Renewable Diesel is Setting the LCFS Credit Price, and Will Continue to Do So Under the Proposed Amendments

Our research group has released two reports in the last year related to modeling of California’s LCFS through 2035. The more recent of these reports details evidence of a recent, and very significant shift in alternative fuel market dynamics in California. The LCFS has historically supported a variety of fuels and technologies, including ethanol, biodiesel, renewable diesel, renewable natural gas, electricity, hydrogen and others. Despite some of these technologies



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being more mature and lower-cost than others, no single technology or fuel pathway was able to dominate the market or grow in such a fashion that it restricted or crowded out the others. This is, in large part, because the growth of each technology or fuel type was constrained by limits imposed by factors outside of the LCFS. Ethanol, for example, was constrained by the E10 blend wall and the limited uptake of higher-ethanol blends like E85. Electricity, renewable natural gas, and hydrogen were constrained by the relatively limited number of vehicles capable of consuming these fuels. Biodiesel was subject to blend limits and infrastructure compatibility challenges, which limited its potential growth.

Renewable diesel (RD), however, was not subject to similar inherent limitations on its growth. Since it can be used at 100% blends in virtually all diesel engines, and is broadly compatible with existing distribution infrastructure (and additional infrastructure, e.g., pipelines, has emerged alongside the increased consumption in the state), the only limit on the amount that could be consumed in California is the total production available to our market, or the total consumption of diesel fuel and diesel substitutes. Prior to 2020, total global capacity to produce RD was quite limited, and much of what existed was sold into the European market; this capacity limit prevented runaway growth for RD in the California market, despite robust incentives. Rapid deployment of RD production capacity in North America over the last 3-4 years, however, has effectively eliminated this constraint.⁶ As a result, volumes of RD entering the California market have grown very rapidly, more than tripling since 2020, to almost 2 billion gallons in 2023.⁷ Approximately 61% of total diesel consumed in California in 2023 was biodiesel or renewable diesel.

163.4

While the displacement of petroleum fuels by lower carbon alternatives is one of the primary goals of the LCFS, this development also carries with it several significant risks that have been inadequately addressed by the analysis presented in LCFS workshops and hearings. One of these, related to indirect land use change (ILUC) risk will be discussed later in this comment.

163.5

Another significant risk is that continued growth of RD will continue to hold LCFS credit prices down, and crowd out other fuels for the next several years. LCFS credit prices fell below \$100 in mid-2022, and have generally been between \$60 and \$75 for the last 18 months. This is widely considered to be too low to support the deployment of many critical low-carbon fuel infrastructure and production capacity projects, notably medium- and heavy-duty EV charging infrastructure, cellulosic fuel or e-fuel production capacity, and carbon capture and sequestration

⁶ EIA, Domestic renewable diesel capacity could more than double through 2025 - U.S. Energy Information Administration (EIA). <https://www.eia.gov/todayinenergy/detail.php?id=55399> and M. Gerverni, T. Hubbs, and S. Irwin, "Revisiting Biomass-Based Diesel Feedstock Trends over 2011-2022" (2024); <https://farmdocdaily.illinois.edu/2024/01/revisiting-biomass-based-diesel-feedstock-trends-over-2011-2022.html>

⁷ CARB Quarterly Data Summary Spreadsheet. https://ww2.arb.ca.gov/sites/default/files/2024-04/quarterlysummary_Q42023.xlsx



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(CCS) projects. Renewable diesel, however, has continued its very rapid growth during this period, indicating that LCFS credit prices in this range are sufficient to support its growth.

Staff's presentation on April 10th acknowledged that U.S. RD production capacity was sufficient to displace all of California's diesel consumption, and the last three years have provided ample evidence that large volumes of RD are available to the California market at LCFS credit prices in the \$60-80 range. Despite gradual reductions in RIN prices, the pace of RD production capacity growth shows little sign of abating, with over 1 billion gallons of nameplate capacity expected to come online in California during 2024, with more slated in other parts of the U.S.. This continued capacity growth indicates that significant volumes of RD in addition to what is already consumed in California will be available this year or shortly thereafter. Even with higher deficit generation due to increased program targets, including large step-downs, the amount of RD available is sufficient to supply all additional compliance credit needs for the next 2-3 years at least.

Market mechanisms like the LCFS are explicitly designed to minimize total compliance costs by giving obligated parties the flexibility to pick the most attractive route to compliance. RD has clearly demonstrated itself to be the lowest-cost option to expand credit generation over the last 2-3 years. This can continue for several more years at least, until the remaining 40% of our total diesel demand that continues to be satisfied by petroleum, around 1.5 billion gallons/year, is converted to RD.

Rapid growth of RD is not always a negative outcome. Displacing fossil fuels with alternatives is, in fact, a primary goal of the LCFS and we are reasonably confident that the RD that has entered the state to date is lower-carbon than petroleum over its full life cycle. So it is reasonable to ask why California should rein in this rapid transition to RD. There are two primary reasons for this. First, the analysis of the carbon intensity of RD used by the LCFS includes estimates of indirect land use change impacts that are outdated and do not reflect current market conditions. It is likely that actual life cycle GHG emissions from many RD pathways are higher than their certified CI scores under the program, and as volumes increase the per-gallon ILUC impacts are likely to increase as well. There is a significant risk that GHG benefits from continued RD growth will be significantly smaller than their LCFS credit generation would imply, or even that future RD may no longer provide significant GHG benefits when displacing petroleum. We will discuss ILUC in more depth later in this comment. Second, even where RD GHG benefits are appropriately quantified, the technology has limited potential to reduce emissions significantly below current levels. Waste-based RD pathways can achieve 70-80% reductions in life cycle GHG emissions compared to petroleum diesel, however the supply of wastes is extremely limited. Byproduct or coproduct feedstocks, or crop-based ones, cannot achieve deep GHG reductions due to emissions from feedstock production. While some opportunities to reduce GHG emissions from RD production exist, such as the use of low-carbon hydrogen or sequestration of process emissions, these cannot fully offset all production emissions. This means that RD lacks a plausible pathway to zero or near-zero emissions for

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non-waste feedstocks and is best viewed as a bridge fuel, to help reduce emissions while zero-emission options like EVs are deployed. Under current market conditions, RD is likely to dominate the market for additional compliance credit until California's diesel pool is fully saturated, depriving other technologies that may have a better capacity to provide zero-emission transportation fuel in the future of badly-needed investment. While continued LCFS target increases will eventually result in some varieties of RD no longer generating credits, this is not expected to occur for 5-10 years. During the years when uncontrolled growth of RD allows it to continue setting the marginal cost of LCFS compliance, technologies that need a higher credit price to deploy will be unable to receive the amount of incentive they need. This will result in several years in which we would expect minimal investment in technologies apart from RD, which will mean several years of lost opportunities for zero- or near-zero carbon technologies to enter the market and begin maturing. While the reliance on RD may minimize short-term LCFS compliance costs, it would likely increase the long-run cost of achieving carbon neutrality.

This is not to say that complete removal of RD from the LCFS is advisable. Bridge fuels can play a valuable role in the transition to zero-carbon transportation and even the most optimistic projections of EV deployment predict billions of gallons of liquid fuel demand in the on-road space through the mid-2040's or longer; most liquid fuels have the potential to shift into the aviation market which will likely be dependent on liquid fuels for several more decades.⁸ To the extent bridge fuels can be made from wastes, residues or feedstocks that pose little risk or ILUC or other indirect effects, these fuels can provide critical near-term emissions benefits and help displace petroleum. To the extent that our comments sound a cautionary note about RD and other lipid-based fuels, we emphasize that the concern is more focused on continued growth of these fuels at present rates. Our February report and comment letter evaluates several options for restricting the growth of these fuels. We conclude that while a cap is a relatively blunt, imperfect approach, it is probably the only one that can feasibly be implemented within the timeframe of the current rulemaking, and offer the following suggestions regarding effective cap design and implementation.

- The cap could target either crop-based feedstocks, all lipids or both. Targeting crop-based feedstocks allows for greater use of wastes and residues, but a cap on all lipids offers better protection against ILUC risk.
- Setting the cap at approximately 2022 levels of consumption - 500 million gallons/year of crop-based fuels or 2 billion gallons/year of lipid based fuel - offers a good degree of certainty that the market will be brought back into balance and the AAM will not be triggered, thereby minimizing gas price impacts to California consumers. 1 billion

⁸ Brown, et al. (2021) *Driving California's Transportation Emissions to Zero by 2045*
<https://escholarship.org/uc/item/3np3p2t0>



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gallons/year of crop-based fuels, or 3 billion gallons/year of lipid-based fuels are both likely to trigger 2 AAM events and result in a 39% LCFS target in 2030.

- The cap could be implemented by duplicating the existing LCFS Reporting Tool and Credit Bank & Transfer System (LRT-CBTS) to create a separate credit tracking platform for the specified credit types (those based on crop or lipid feedstocks). Alternatively, CARB or a designated entity could establish a quota system for producing fuels from the specified feedstock types, in which case credits would only be issued for those fuels when the producer can show they have obtained an adequate share of the quota.
- The cap could be imposed as a temporary measure, until a permanent solution could be developed.
- If a cap is set at levels below present-day consumption of the specified fuel types, then a phase-in period should be granted to allow time for producers to find alternative markets for their product.

Reasons Stated for Rejecting the EJ Alternative or Alternative 1 Do Not Negate the Need to Restrict Crop-Based Biofuel Growth

At the April 10th workshop, Staff reiterated the reasons for rejecting alternatives proposed in the ISOR that included a cap on crop-based fuels, the EJ Scenario and Alternative 1. These included lower total GHG reductions and air quality improvement. We appreciate the additional explanation provided by Staff at the workshop, however the reasons specified do not rebut the need to restrict the growth of BBD.

First, both scenarios adopt unnecessarily tight restrictions on the total quantity of lipid-based fuels (biodiesel, renewable diesel, and SAF, all of which are made from fats, oils and greases). Alternative 1 peaks at around 2 billion total gallons of these fuels, but consumes significantly less in most years. The EJ Scenario limits the total to around 1.4 billion gallons. Our recent paper and previous comment identify 2 billion gasoline-equivalent gallons as a level of consumption under which we have a high confidence that no AAM triggering events will be initiated; setting the cap slightly above this level may also allow the supply of credits and deficits in the market to be brought back into balance. CATS model outputs for the proposed 7% step-down scenario modeling outputs show that lipid based fuel consumption never exceeds 2.4 billion gallons. As discussed above, the structure of CATS and lack of banking behavior suggest that this is a significant underestimate of actual lipid-based fuel consumption under such a scenario, however it does confirm that the market can meet even more ambitious step-down levels with a cap on crop- or lipid-based feedstocks. Moreover, the total quantity of GHG reductions from biofuels under a the 2 billion gallon total lipids cap scenario we analyzed in our recent report will be quite similar to those presented in the 7% step-down scenario. Because the total volumes of BBD and SAF are approximately equivalent, we would expect similar air quality impacts as well.



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Staff also noted that the restrictions on BBD and SAF use would reduce air quality benefits as compared to a scenario in which the use of these fuels was unrestricted. While both BBD and SAF offer some air quality benefits, when displacing petroleum fuels, the additional benefits are minimal when considered in the context of total state emissions. The difference in state-wide PM_{2.5} emissions between the EJAC scenario and the proposed alternative was 1.43 tons per day at its maximum, in 2025, and less than 1 ton per day for all years after 2028. This compared to total statewide PM_{2.5} emissions of over 960 tons per day through this period, of which, around 370 tons per day are from anthropogenic sources, and around 50 are from mobile sources. This means that the reduction in PM is around 0.4% of total anthropogenic emissions, or less than 0.2% of total emissions. Given the inherent uncertainties in projecting future vehicle fleet composition and behavior, the potential PM benefit from higher levels of BBD and SAF are quite probably smaller than the inherent uncertainty associated with these modeling tools.

163.7 The analysis of the NO_x impacts show even less benefit for the Proposed Scenario as compared to the EJ Scenario. First, it should be noted that the CARB analysis finds a NO_x benefit from the use of SAF, whereas guidance from the National Academies of Science indicates no significant NO_x benefits from blend levels <50%.⁹ The impact of SAF on total NO_x emissions from aircraft is small in this analysis, however, and new data are constantly emerging on the impacts of SAF on modern jet turbine engines. Even assuming significant NO_x impacts from SAF, the EJ scenario shows lower state-wide NO_x emissions than the Proposed Scenario through 2036. Similar to the PM_{2.5} analysis, the difference between these two scenarios is significantly less than 1% of total anthropogenic emissions in all years, and likely smaller than the uncertainty associated with the modeling tools and data sources employed.

Taken together, the PM and NO_x emissions benefits from the Proposed Scenario, which does not limit the use of biofuels, are minimal and significantly smaller than the uncertainty inherent in the modeling tools used to perform this analysis. PM and NO_x benefits do not provide a compelling reason to reject caps on crop- or lipid- based biofuels.

163.8 Finally it should be noted that the higher GHG benefits Staff's analysis ascribes to unrestricted consumption of biofuels depends on the pathway CI scores for such fuels actually matching real-world performance. Given the uncertainty around ILUC adjustment factors, which will be discussed in the next section, this cannot be taken for granted. The purpose of a cap on crop- or lipid-based biofuels is, in part, to limit the potential damage if real-world GHG emissions exceed certified pathway CI scores. Given the likelihood that ILUC impacts from lipid based fuels are significantly higher than the values currently used in the LCFS, it is possible that the purported GHG benefits of scenarios with no cap or limitation on consumption are less than expected.

⁹ ACRP (2019),. *Alternative Jet Fuels Emissions Quantification Methods Creation and Validation Report*, https://onlinepubs.trb.org/onlinepubs/acrp/acrp_wod_41.pdf



Feedstock Sustainability and Indirect Land Use Change

A second major area of discussion at the April 10th workshop concerned feedstock sustainability requirements and indirect land use change (ILUC) risk mitigation. Staff provided more detail regarding the feedstock sustainability certification proposed in the 45-day amendment package, as well as provisions for ILUC assessment in cases where the feedstocks used are outside the scope of ILUC adjustment values reported in Table 6 of the regulation.

163.9 While we appreciate the additional discussion, and staff's efforts to strengthen the proposed sustainability certification provisions, as well as address stakeholder feedback about novel ILUC scenarios, the new proposals do not effectively address the concerns we discussed in our February 20th comment letter. Even with the concepts discussed at the April 10th workshop, the proposed amendments fail to address the serious risk that the LCFS will drive harmful land use change due to increased biofuel consumption. In that case, not only would GHG emissions be significantly higher than the pathways CI scores would indicate, but California's fuel policy would be supporting patently unsustainable land conversion, loss of ecosystems, and encroachment on culturally sensitive lands. Significant additional steps are required to effectively mitigate this risk. New modeling is required to update the ILUC adjustment values in table 6 to bring them into line with current data and scientific understanding of land use change, and they must be regularly reviewed and updated in the future.

163.10

Proposed Sustainability Guardrails Are Inadequate Protection Against Environmental Risks

At the April 10th workshop, staff proposed a set of sustainability "guardrails" to protect against land use change risk, food vs. fuel competition, and other negative environmental impacts from the use of biofuels. Staff requested information and perspectives from stakeholders on several key questions related to vegetable oil consumption for biofuels, provided additional information regarding previously proposed feedstock sustainability requirements, and proposed additional provisions relating to indirect land use change (ILUC) impacts from feedstocks sourced outside the U.S. We appreciate the additional clarity provided by staff about these provisions, and agree that feedstock sustainability requirements are a useful tool that should be part of the LCFS. Even with the clarification and new proposals however, the proposed amendments create a severe risk of spurring ILUC-driven deforestation, which in turn causes significant GHG emissions, loss of biodiversity and critical ecosystems, and negative impacts on local communities.

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The material presented at the April 10th workshop does not articulate a response to the analysis we presented in our 2024 report or Feb 20th comment letter; these issues were corroborated by comments submitted by several other independent, non-profit organizations and land use researchers.¹⁰ The proposed feedstock sustainability requirements can only be applied to the quantities of vegetable oil being used to produce fuels that are credited under the LCFS. While appropriately designed and implemented sustainability guidelines can help ensure that this feedstock is grown and processed according to best practices, all extant sustainability certifications we are aware of are blind to the impacts of ILUC, which occur elsewhere in the world. When soybean oil that was historically exported into global vegetable oil markets is instead turned into biofuels in the U.S., alternative sources of vegetable oil emerge to replace that lost supply. Some of that replacement is obtained by bringing more land into cultivation, this is the mechanism by which ILUC occurs. The majority of total global vegetable oil consumption occurs in markets that lack effective sustainability certification systems. So long as markets present sufficient demand to accommodate the amount of oil grown on recently-deforested land, sustainability certifications will be unable to prevent ILUC.

Sustainability Certification Systems Could Mitigate ILUC Risk If They Can Show That Feedstock Used For Biofuels Does Not Result in Unmet Demand Elsewhere

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Staff asked for input on how sustainability certifications could be applied to reduce ILUC risk. Given their limited scope, as discussed above, we can think of only one way that they could effectively limit ILUC risk: by ensuring that there was no prior use of feedstock that came from the source in question. ILUC is ultimately caused by increasing net demand for agricultural commodities, when fats, oils, and greases are taken from a previous use and redirected to biofuels, the previous consumer now has an unmet demand. That demand came into existence because of the expansion of biofuel production, even though the entity that actually directly responsible for the demand may be completely unconnected to the biofuel industry and in a different country. If certification systems could provide strong certainty that the use of a specified lot of feedstock did not result in the creation of unmet demand, it would provide significant reassurance that ILUC impacts were low.

Certifying that a specific lot of feedstock, when used to produce biofuels, would not cause unmet demand is difficult, however, and may require extensive documentation that is not routinely collected at present. Certification bodies would have to provide certainty that the feedstock would not otherwise have gone to some productive use that would demand an alternative if they lost access to their *status quo* feedstocks. For example, if it could be conclusively documented that waste or residue oils had historically been disposed of in a landfill, or by incineration, and the feedstock provider could provide credible documentation of

¹⁰ Murphy & Ro, *UC Davis Comment on Proposed LCFS Amendments*.
<https://www.arb.ca.gov/lists/com-attach/7085-lcfs2024-Wi9QNQNdAzRXMAF3.zip>



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163.13 this historical behavior, then that feedstock could be reasonably said to have no ILUC impact.¹¹ For crop-based feedstocks, the producer would have to be able to demonstrate that the land used to produce the feedstock had not been in productive use, or that there would be no unmet demand arising from the redirection of feedstock away from a previous use and into biofuels instead. We note that most certification systems protect against emissions from direct land use change by refusing to certify feedstocks grown on land that has not been under cultivation for an extended period of time. This means that the certification conditions required to prevent direct land use change - that the land has been under cultivation - and the conditions required to prevent indirect land use change - that no useful products had historically been produced on the land used to grow feedstock - would combine to exclude the vast majority of land from being able to produce feedstock that could be certified as sustainable. This is why certification systems are generally not well-suited for mitigating against ILUC risk, and model-based approaches are typically preferred.

Current Evidence Suggests that Biomass Based Diesel Demand is Affecting Global Vegetable Oil Markets, and Contributing to Deforestation

163.14 In the April 10th workshop, Staff requested input on whether biomass-based diesel (BBD) demand is increasing oilseed demand or prices, or leading to deforestation. Staff correctly observed that the price trends around oilseeds are highly variable and subject to a wide range of economic, environmental, and geopolitical factors. Oilseed price alone cannot conclusively determine whether BBD demand is spurring ILUC or increasing emissions. ILUC's harm is caused by the conversion of land to agricultural use, with the products of that land back-filling commodities lost to biofuel production; that is to say, ILUC occurs when new demand for agricultural commodities caused by expansion of biofuels is satisfied by new production. The new demand for agricultural commodities is a simple, easily observable fact: millions of tons of feedstock is being consumed in the U.S. today that was not consumed 5 or more years ago. We have seen no evidence of disruption in the markets that formerly consumed current biofuel feedstocks, e.g. vegetable oil for human consumption, animal feed, soap production etc., which strongly suggests that these markets have found alternative suppliers to replace what was lost. This is clear evidence that biofuel policies are increasing global vegetable oil demand since the only plausible alternative source of lipids at commercial scale is vegetable oil. So long as the new producers of vegetable oil have a similar cost structure as the incumbent ones, this expanded supply would not be expected to significantly shift prices in related commodity markets.

¹¹ In the case of incineration, we assume that any energy production from the incinerator would be replaced by zero-carbon sources, meaning no net demand for energy would emerge from having the feedstock shifted to biofuel production. In practice, certification bodies would have to document this to certify a specific batch of fuel.



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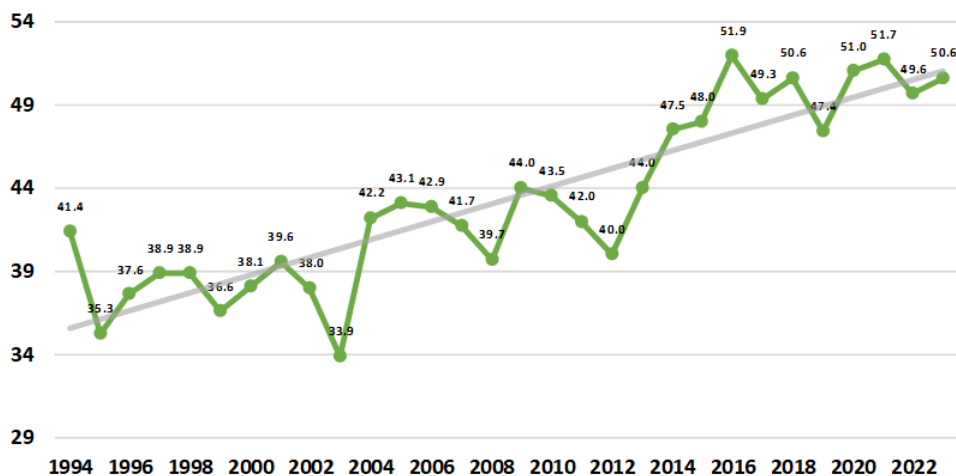
There is clear and direct evidence, however, that BBD is adding significant new demand to global vegetable oil markets, and that yields of U.S. oilseeds have not kept pace. Figure 1 shows per-acre yields of the primary oilseed grown in the U.S., soybeans.¹² Yields have been nearly flat across the 2016-2022 time period. Even if we take the lowest-yielding year in this range, 2018, as the starting point, yields have gone up by just 4.6% since then.



Soybean Yield United States



Bushels per Acre



United States Department of Agriculture
National Agricultural Statistics Service

January 12, 2024

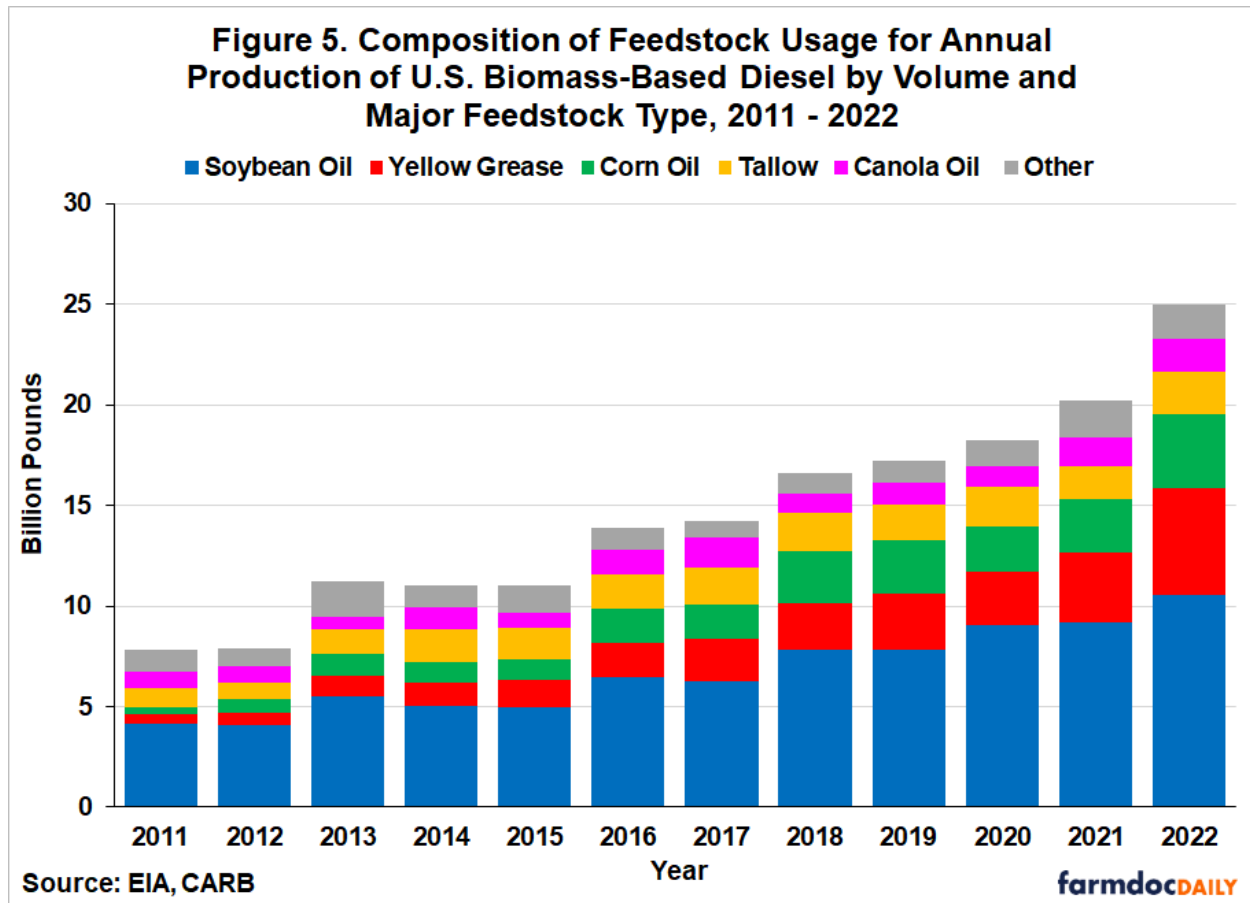
Consumption of vegetable oils as BBD feedstock, especially RD, has grown extremely rapidly over the same period. Total U.S. feedstock demand has grown from around 14 billion lbs in 2016 to 25 billion lbs in 2022, a 79% increase. 4-5 billion gallons of that increase was met by soybean and canola oils, the rest came from residues like tallow and yellow grease (primarily used cooking oil or UCO, a significant fraction of which is imported). Data presented by Staff at the April 10th workshop corroborate this impression; slide 55 showed an approximately 15% increase in global soybean oil production since 2016, compared to an approximately 50% increase in industrial demand for soybean oil, primarily from the U.S., over the same period. Even where waste and residue feedstocks are used, most of those feedstocks were previously used as inputs to other industrial processes like animal feed production or soap making. In most

¹² USDA National Agricultural Statistics Service (2024)
https://www.nass.usda.gov/Charts_and_Maps/Field_Crops/soyld.php



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cases, these industrial consumers will turn to an alternative source of lipids for their process, such as vegetable oils. This means that even waste and residue oils have a non-zero ILUC impact, though typically a smaller one than crop-based oils.



Given the clear evidence of massive increases in demand for lipids, and equally clear evidence that this demand is not being met via yield increases or the emergence of novel low ILUC risk crops, one of two things must be true: either non-biofuel consumption of lipids has declined proportionately to the increase in demand from BBD production, or production has increased to compensate for the new demand. We can find no evidence global consumption of vegetable oils has significantly declined in the last 6-8 years - in fact it continues to increase with population and economic growth - nor is there any evidence that oilseed yields outside the U.S. have increased significantly faster than the historical trend. In short: there are few, if any, plausible alternative explanations for the increased supply of lipids that exclude significant ILUC.

163.14
cont.

Data on global rates of deforestation support the conclusion that biofuel demand is contributing to, though not solely responsible for, continued loss of forest. Forest tracking by the World Resources Institute showed a significant increase in aggregate global forest cover loss starting in 2016, roughly the start of significant BBD capacity expansion in the North American market;



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163.14 deforestation has remained above the pre-2016 trend since then.¹³ Indonesia, a focal point for
 cont. biofuel-driven deforestation in the 2000's and 2010's, has seen an increase in rates of
 deforestation since 2021. Clearly, biofuels are not the sole cause of deforestation, but it is
 equally clear that additional demand from biofuel growth exacerbates this harmful trend.

163.15 Sustainability requirements and preferences for waste or residue feedstocks are insufficient to
 protect against this risk. The LCFS already provides substantially higher incentives for wastes
 and residues than for crop-based fuels due to their lower CI scores. Despite this preference, the
 amount of crop-based BBD has more than doubled since 2021.¹⁴ While it is too soon to tell what
 impact the sustainability certification requirements will have on feedstock availability, comments
 from U.S. biofuel producers and agricultural companies typically claim that standard industry
 practices meet or exceed the environmental metrics required under the proposed sustainability
 certification. We have seen no evidence to indicate that the proposed sustainability certification
 will reduce the pool of potential feedstock available to the California market to the point where it
 impedes continued growth of BBD production. This is to say, the proposed combination of
 preferences for waste-based fuels and sustainability certification requirements is likely to have a
 very limited impact on the actual supply of feedstock for biofuel production. While they may
 exclude isolated cases of high environmental impact, they are unlikely to represent a significant
 change in market dynamics compared to the *status quo*. Given that the *status quo* is
 characterized by problematically low LCFS credit prices, unsustainable rates of growth in BBD
 production, and significant concerns about ILUC impacts, alternative approaches may deserve
 serious consideration.

163.16 ILUC is, at its core, a problem of aggregate demand for agricultural commodities. Biofuel
 demand for vegetable oils or other agricultural commodities was nearly zero until the
 mid-2000's, but has grown rapidly since then. The additional production used to satisfy the
 demand from this new use came, in part, from expansion of cultivated area. Waste feedstock
 preferences and sustainability certification can ensure that biofuels use the highest-quality,
 lowest-GHG feedstock available, however not all increased demand is satisfied by high-quality,
 low-GHG feedstock. The only way to limit these harms is to restrict the total demand growth to a
 level that can be satisfied without requiring additional land conversion. A cap on specified types
 163.17 of feedstock could achieve this.

¹³ World Resources Institute (2024) <https://research.wri.org/gfr/latest-analysis-deforestation-trends>

¹⁴ CARB Quarterly Data Summary Spreadsheet.

https://ww2.arb.ca.gov/sites/default/files/2024-04/quarterlysummary_Q42023.xlsx This assumes that the vast majority of the RD-Other category comes from canola or other crop-base oils.



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The Proposed ILUC Approach for Un-Specified Feedstock Types is Inadequately Protective Against ILUC Risk, Methodologically Unsound, and Could Benefit Imported Fuels Compared to Domestic Ones

163.18

At the April 10th workshop, Staff discussed revisions to the current LCFS approach around ILUC. In particular, Staff noted that the Land Use Change adjustment values specified in Table 6 of the regulation are specific to certain geographical areas. Pathways using feedstock from areas not covered by Table 6 have been submitted for public comment in recent months, and Staff sought input on how these should be handled in the future.

Slide 65 indicates that in cases where a pathway uses feedstock not covered by Table 6, Staff would make a case-by-case determination based on empirical sub-national production data. The use of land cover data, including remote sensing or satellite imagery was proposed as one option for obtaining the required empirical data. Few details on the nature of this analysis were provided, and it is difficult to effectively evaluate the efficacy of such a solution without knowing more about the methodology to be employed in making these determinations.

At a conceptual level, however, ILUC analysis is not amenable to purely, or even primarily empirical solutions. ILUC cannot be directly measured, because it is a phenomenon that works indirectly, through global markets. While sensors can provide empirical data to show that a given parcel of land was cleared for cultivation, there is no empirical way to conclusively identify why that clearance, or any land use change decision, occurred; not all land clearance is due to ILUC. More importantly, many ILUC impacts occur in different regions, or different countries than the activity that causes them. For example, reduced U.S. soybean oil exports results in un-met demand for vegetable oils in the countries that formerly received those exports. The land use change that occurs because of reduced U.S. soybean oil exports may occur in South America, Asia, Africa, or elsewhere. A sub-national data analysis will not capture impacts outside of its geographic scope.

Beyond the geographic limitations, empirical approaches cannot effectively quantify ILUC. ILUC is assessed through consequential analysis, typically comparing the outcomes or expected outcomes of a given project against a counterfactual scenario in which the project did not exist. Counterfactual scenarios, by their very nature, do not exist and so cannot be empirically assessed. The emphasis on empirical analysis therefore conflicts with the methodologies needed to effectively assess ILUC.

The assessment of ILUC, like any life cycle analysis, requires making certain analytical assumptions related to system boundaries, allocation methodology, additionality determinations, and establishment of counterfactuals. Most of these assumptions do not have a purely objective basis on which to make them; there is no single objectively correct approach to setting a system



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163.18
cont.

boundary or allocating impacts among coproducts.¹⁵ Allowing case-by-case empirical analysis creates an opportunity for different assumptions to be used by different applicants, leading to pathway certified carbon intensities that are not comparable and create an unequal playing field for LCFS market participants. Establishing a consistent model-based methodology ensures that pathway applicants cannot leverage favorable analytical assumptions to gain a competitive advantage. This is especially important given that the proposal would require pathways using feedstocks that are included on Table 6 to continue using those ILUC values; foreign producers or those using a novel feedstock could obtain a competitive advantage from the non-comparable and probably less strict empirical methodology.

The Existing ILUC Methodology is Outdated, Unsuitable For the Current Market, and Inadequately Protective Against ILUC Risk

163.19

The proposed new approach for ILUC assessment and risk mitigation for feedstocks not specified in Table 6 is not only inadequate in and of itself, but it is built upon the assumption that the existing ILUC approach is adequate for feedstocks that appear on Table 6. We have discussed, in depth, the reasons why the current ILUC approach is inadequate in previous comment letters, but will summarize them here.

1. The GTAP-AEZ modeling used to create the Land Use Change adjustment values in table 6 was conducted in 2015 and 2016, making it almost 10 years old. Not only have researchers significantly improved our understanding of the mechanisms of ILUC, but a much longer and higher-quality data record now exists, and there have been significant changes in markets, technology, geopolitical conditions, and agronomic behavior over the last decade. ILUC is a phenomenon for which analysis must be regularly updated.
2. While it may have been state of the art at the time, recent research has highlighted significant structural flaws in the version of GTAP used when the analysis for Table 6 was completed.¹⁶ These flaws tend to bias the results toward underestimation of ILUC impacts. The lead researcher from CARB's modeling effort that developed the values in Table 6 submitted a comment to the 45-day docket corroborating the conclusion that the version of GTAP used was flawed and a new approach should be adopted.¹⁷
3. The analysis used to develop Table 6 simulated a "supply shock" based on approximately 1 billion gallons of new demand for BBD feedstock. Current U.S. BBD

¹⁵ See: Murphy (2023) *Making Policy in the Absence of Certainty: Risk-Aware Consideration of ILUC Estimates for Biofuels* for a deeper discussion. <https://www.youtube.com/watch?v=eT06-vw0Fnw>

¹⁶ E.g. Malins, *et al.* (2020) <https://www.sciencedirect.com/science/article/abs/pii/S0959652620307630> and Berry, *et al.* (2024)

<https://www.arb.ca.gov/lists/com-attach/6987-lcfs2024-AXVUPQNqUWsDa1AP.pdf>

¹⁷ O'Hare (2024) *Low Carbon Fuel Standards Amendments*.

https://www.arb.ca.gov/lispub/comm/iframe_bccomdisp.php?listname=lcfs2024&comment_num=7063&virt_num=380



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production capacity is several times that amount already, meaning that the scenario analyzed does not reflect current or future market conditions. Average per-gallon ILUC impacts like those reflected on Table 6 will tend to increase as total volumes of biofuel increase, because as waste and residue sources are tapped out, a greater fraction of total production will be met by crop-based sources. Additionally, as cultivated area expands over time, high-yielding areas will typically be brought into cultivation first, meaning that as total demand increases, each additional unit of production will, on average, require more land to produce.

163.19
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Taken together, these factors indicate that not only are the ILUC values outdated and almost certainly inaccurate, but they are likely to be underestimates of actual ILUC impact. While it is still likely that most BBD credited under the LCFS to date is lower-carbon than petroleum over its full life cycle, it is likely that many pathways - especially those using crop-based feedstocks - do not actually yield the GHG benefits their CI scores would indicate. This mismatch between certified CI scores and actual GHG impacts is likely to increase, since per-gallon ILUC effects would tend to increase as total vegetable oil production increases. This leads to LCFS revenue being given for emissions benefits that do not actually exist. Beyond that, it complicates effective policy planning and evaluation. For example, the stated rationale for rejecting the LCFS alternatives that cap or otherwise limit BBD includes foregoing the GHG reductions that BBD could provide. CARB's estimates of GHG reductions, however, are based on the pathways certified CI scores for existing biofuels. Given that the ILUC adjustments included in those scores are clearly inaccurate, and likely to be underestimates, the GHG benefits associated with those fuels are likely to be less than anticipated.

Other Issues Raised at the April 10th Workshop

In addition to the in-depth discussion of LCFS market modeling, new compliance trajectories, and feedstock sustainability, a few other issues were raised. We address them here.

Historical Analysis of Correlation Between LCFS Credit Price and Gas Prices Does Not Effectively Project Future Gas Price Impacts

On slide 11 CARB staff presented a figure drawn from a consulting report by the economic consulting firm Bates White that shows trend lines for LCFS credit prices and retail gasoline prices. These lines show no visual correlation and staff repeated language from the consultant's report that "LCFS program price effect at the pump is not a significant driver of retail fuel prices in California".

163.20

It is true that an analysis of LCFS program data from 2010 through the present would show little if any visually detectable correlation between LCFS credit prices and retail gasoline prices. This



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conclusion, however, does not hold into the future. Per-gallon LCFS cost impacts can be estimated by multiplying the amount of credits or deficits per gallon times the relevant LCFS credit price. Per-gallon credit generation is a function of the target level, the CI scores of the fuel, and several constants including EER and fuel energy density.¹⁸ During most of the period covered by this analysis, the LCFS targets were extremely low. Targets were effectively frozen at 1% reduction from baseline through 2015 due to litigation, and did not hit 10% until 2022. Given these low targets, the per-gallon deficit generation would be extremely low as well, meaning that any impact from the LCFS would likely be lost among the significant natural variability in retail gasoline prices. Theoretically, there is no reason to think that costs on petroleum fuels, even if modest, wouldn't be passed along to consumers, and emerge in an appropriately structured updated statistical analysis.

163.20
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It is not appropriate to interpret the Bates White analysis as supporting the conclusion that the LCFS will have no price impacts in the future; since program targets are increasing, the per-gallon deficit generation will increase as well and with it, a commensurate increase in costs associated with LCFS deficits.

It should also be noted that even though the LCFS is expected to have a price impact in the future, this impact is expected to be smaller than normal seasonal gas price variability for most of this decade at least, and the benefits the program provide via slowing climate change, improving air quality, supporting the transition to renewable energy, and making critical investments in disadvantaged communities far outweigh the costs in most analyses. UC researchers evaluated total transportation costs associated with the transition to clean fuels and electric vehicles, including the costs of the LCFS as part of our study on how California's transportation system can achieve carbon neutrality.¹⁹ We found that by 2030 the lower fuel and maintenance costs of EVs more than offset the higher costs of vehicles and fuels for legacy vehicles; the LCFS is a critical part of the portfolio of policies that supports electrification. Indeed, diversification of transportation fuels, and appropriately accounting for externalities like GHG emissions, are critical to decarbonization, greater societal benefit, and lower transportation costs in the longer run.

163.21

E15 May Offer the Opportunity to Mitigate Gas Price Increases and More Rapidly Reduce Emissions

On slide 52, Staff asked whether E15 should be considered to help reduce gas cost impacts. Our modeling has explored the possibility of shifting to E15 as the default fuel for spark-ignition engines.²⁰ The risks associated with an E15 standard are primarily focused around aggregate

¹⁸ See Section 95486.1 of the LCFS regulation text

¹⁹ Brown, *et al.* (2021) *Driving California's Transportation Emissions to Zero by 2045*
<https://escholarship.org/uc/item/3np3p2t0>

²⁰ See Brown *et al.* (2021), Ro, *et al.* (2023), and Murphy & Ro (2024)



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demand for agricultural commodities as feedstock, particularly corn. While significant expansion of total corn ethanol production in the U.S. could lead to significant ILUC or other impacts, the anticipated decline in gasoline consumption as the light-duty vehicle fleet shifts to EVs offers an opportunity to extract additional value out of ethanol with minimal risk. So long as the shift to an E15 standard is timed to ensure that no significant increases in total demand for ethanol occur, or that demand is satisfied by fuels and feedstocks that present low risk of ILUC, an E15 standard can be compatible with California's goal of carbon neutrality by 2045.

163.21
cont.

Adopting an E15 standard would provide two notable benefits. First, it would rapidly displace a small but significant amount of petroleum from California's fuel pool. While corn ethanol offers only modest GHG benefits when displacing petroleum, the scale of California's transportation sector means that even relatively small shifts in fuel CI can yield significant GHG savings. Second, by reducing the amount of petroleum consumption, California may be able to insulate itself from oil price volatility and possibly begin driving down petroleum prices due to reduced structural demand.

Unresolved Issues Point to Need for Additional Rulemaking in the Near Term

From the start of the workshop and engagement process that led up to this rulemaking, Staff were clear that the scope would be strictly limited in order to allow timely and efficient adoption of changes that could stabilize the LCFS credit market and help strengthen the LCFS credit price. The workshops, engagement opportunities, and discussion materials circulated since then have reflected this agenda. Given the significant decline in LCFS credit prices, this focus on corrective measures is understandable.

The limited scope, however, meant that many critical and complex structural topics that, when fully explored, might offer avenues to improve the efficiency, resilience, and effectiveness of the LCFS as decarbonization proceeds were excluded from this rulemaking. These include, but are not limited to, consideration of updated EERs, updating how the regulation addresses ILUC impacts, addressing appropriate crediting from fossil fuel displacement in a transitioning fleet, treatment of interactions or potential double-counting with other climate programs, harmonizing LCFS protocols with other jurisdictions that have similar programs in place or coming online, preparing for radical LCFS credit market shifts anticipated in the 2030's as program revenues begin declining due to reduced gasoline consumption, expanding the LCFS to cover air, water, and rail fuels, and integrating vehicle or transportation-system effects into fuel CI assessment, differentiation between so-called "bridge" fuels and those with the capacity to achieve carbon neutrality, etc. As discussed in earlier sections of this comment, several of these issues have demonstrated actual or potential capacity to negatively affect the LCFS and/or progress toward California's climate, environmental, and equity goals within the next 5-10 years. The other issues deserve careful consideration and the opportunity for public discussions in a forum that includes stakeholders from a variety of perspectives and LCFS program staff.

163.22



163.23 It is especially important in the transportation fuel space to make policy changes as early as possible, in order to avoid a situation that requires precipitous action that may create stranded assets, excessive fuel price volatility, or erode policy certainty about the LCFS market. The LCFS has in the past conducted major rulemakings following the release of the Scoping Plan; if past patterns hold this would imply the next significant LCFS rulemaking in 2028. By that time, failure to address some of the issues listed above could lead to another destabilization of LCFS credit markets. While many of these issues are complex and will take significant time and resources to address, most are amenable to solutions that can be gradually implemented, to minimize disruption. Waiting until a crisis emerges increases the chance that precipitous, disruptive change will be required.

CARB should commit to a follow-up LCFS rulemaking, without any limitations to its scope, at the earliest possible opportunity.

Thank you again for the opportunity to provide comments on the proposed amendment package. We appreciate the discussion this process has fostered so far and look forward to continuing our dialog through the coming year. We attach to this submission copies of the three recent reports from our research group related to research and modeling the LCFS, they are also available at the links cited in this letter. If we can offer any additional assistance or clarify any of the material in this comment, please do not hesitate to reach out to Colin Murphy by email at cwmurphy@ucdavis.edu.

Signed,

Colin Murphy, Ph.D.

Deputy Director, Policy Institute for Energy, Environment, and the Economy
Co-Director, Low Carbon Fuel Policy Research Initiative
University of California, Davis, California, USA



SUBMITTED VIA ELECTRONIC FILING

May 10, 2024

Matthew Botill
California Air Resources Board
1001 I Street
Sacramento, California 95814

RE: CRTA Comments in Response to April 10th Low Carbon Fuel Standard Workshop

Dear Mr. Botill,

164.1 The Low Carbon Fuel Standard (LCFS) market is experiencing historic negative trends that threaten the continued viability of this nationally recognized program that has been the state's best most successful mechanism for decarbonizing transportation. Again this week, the LCFS credit prices reached an historic low, dropping below \$50, and the credit bank reached an all-time high. The California Air Resources Board (CARB) must act as soon as possible to reverse these outcomes. Investments in alternative fuels have already suffered since this discussion began nearly three years ago and prolonged consideration will only exacerbate the issue.

The California Renewable Transportation Alliance (CRTA) is a diverse coalition of renewable fuel producers, fleet operators, engine manufacturers, consumers, and utilities who, in long-term partnership with the state, have invested millions of dollars in cost-effective alternatives to decarbonized California's transportation sector. We are committed to continuing to help California meet its ambitious climate change objectives. It is within that spirit that we offer this feedback to the alternatives presented at the April 10th LCFS workshop:

- 164.2 1. **Adopt the 9 percent "step-down" proposal.** Market conditions for the LCFS program are rapidly deteriorating. An aggressive step-down is necessary at this point to restore balance to the credit bank.
- 164.3 2. **Initiate the Automatic Accelerator Mechanism (AAM) as soon as possible.** If the 9 percent "step-down" fails to draw down the LCFS credit bank, the AAM should be activated as soon as possible (as early as 2025) to further adjust the curve to an appropriate level to achieve market stability.
- 164.4 3. **Impose a midterm target closer between 30-44 percent by 2030.** As we stated in previous comments, while staff's original midterm goal of 30 percent moves in the right direction, the ICF analysis has demonstrated that a more stringent curve is achievable. Declining market conditions have further punctuated the need for greater action. While the midterm target should not be less than 30 percent, we urge you to be bolder and set a target closer to the ICF recommendation of 41-44 percent.

- 164.5 4. **Adopt the avoided methane credit and “book and claim” provisions outlined in staff’s proposed amendments to LCFS .** LCFS has proven to be a key driver for the effective capture and reuse of otherwise unabated methane emissions, particularly from dairy operations. The use of RNG derived from this process not only helps to decarbonize internal combustion engines like low NOx natural gas trucks and buses, but it can also be used to power and decarbonize battery-electric and hydrogen-based platforms, as envisioned in CARB’s 2022 Scoping Plan Update. Therefore, CRTA supports CARB staff’s recommendation to continue its application of avoided methane accounting and the program’s use of “book and claim” deliverability for RNG projects developed on or before December 31, 2029 that support the transportation sector. We also support CARB staff’s recommendations to provide additional time for RNG-supported hydrogen pathways to boost production of this versatile fuel and capitalize on initial funding for infrastructure and production.
- 164.6
- 164.7
- 164.8 5. **Apply staff’s proposed “True Up” provision to the entire dairy operation.** This will allow projects to recover credits generated on the first day of operation instead of being forced to wait until certification. If not corrected, such delays can deter investment due to the potential for significant interim monetary loss, often calculated in the millions.
- 164.9 6. **Adopt administrative reforms that can help smooth out the process.** For example, streamlining dairy pathway certification from a Tier 2 to a Tier 1 process and reducing long pathway review times by allocating more staff hours to the evaluation.

We look forward to continued conversations with you on the LCFS amendments. Feel free to contact me at nicolerice@ca-rta.org if you have any questions regarding our position.

Respectfully,



Nicole Rice, President
California Renewable Transportation Alliance

May 10, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95815

RE: Proposed Low Carbon Fuel Standard Amendments

Dear California Air Resources Board Members and Staff:

We respectfully submit the following addendum to our prior comments to the California Air Resources Board (CARB) on its proposed Low Carbon Fuel Standard (LCFS) Amendments, dated February 22, 2024, which call for equitable access to book-and-claim accounting for medium- and heavy-duty (MHD) electric vehicle (EV) charging microgrids involving hydrogen and renewable natural gas (RNG) energy sources.¹

About Prologis, Inc.

Headquartered in San Francisco, CA, Prologis, is the global leader in logistics real estate, with a portfolio of over 1.2 billion square feet across four continents and approximately 2.8% of global GDP flowing through our properties each year. Prologis leases modern warehousing and distribution facilities to customers, which include manufacturers, retailers, transportation companies, third-party logistics providers, and other enterprises. Our large, flat rooftops have enabled us to build out commercial solar installations to serve onsite and offsite load with clean energy and battery storage, helping our customers reduce their emissions and placing us second in the U.S. for corporate on-site solar.

Prologis' Mobility business is helping transform the fleet and logistics industry and enabling our customers to transition to zero-emissions through industry-leading electric vehicle (EV) charging technology and solutions. With roughly 180 million square feet of industrial real estate across our California portfolio, the opportunity for us to help our customers with this transition is significant, and we are developing dedicated charging infrastructure at Prologis sites to support their medium- and heavy-duty (MHD) fleets across last mile, drayage, and other applications. In addition to providing charging solutions at our own properties, we offer electrification services at non-Prologis buildings and are developing multi-fleet charging hubs serving areas with dense concentrations of warehouses.

Amend fueling supply equipment requirements to best serve MHD fleets

Prologis echoes the broader comments submitted today by the Joint MHD EV Infrastructure Parties, especially on removing the 250kW Fueling Supply Equipment (FSE) requirement and 10 FSE cap for an important additional reason: as FSE is currently defined in LCFS regulations, and depending on which equipment houses the energy meter, it could create an unintended MHD-Fast Charging Incentive (FCI) toward multi-port all-in-one cabinets when split architectures (dispensers separate from power cabinets) are critical technology catalog options for MHD projects. *(See Figure 1)*

¹ <https://www.arb.ca.gov/lists/com-attach/7026-lcfs2024-UCBUIF0zVmKkYwVi.pdf>

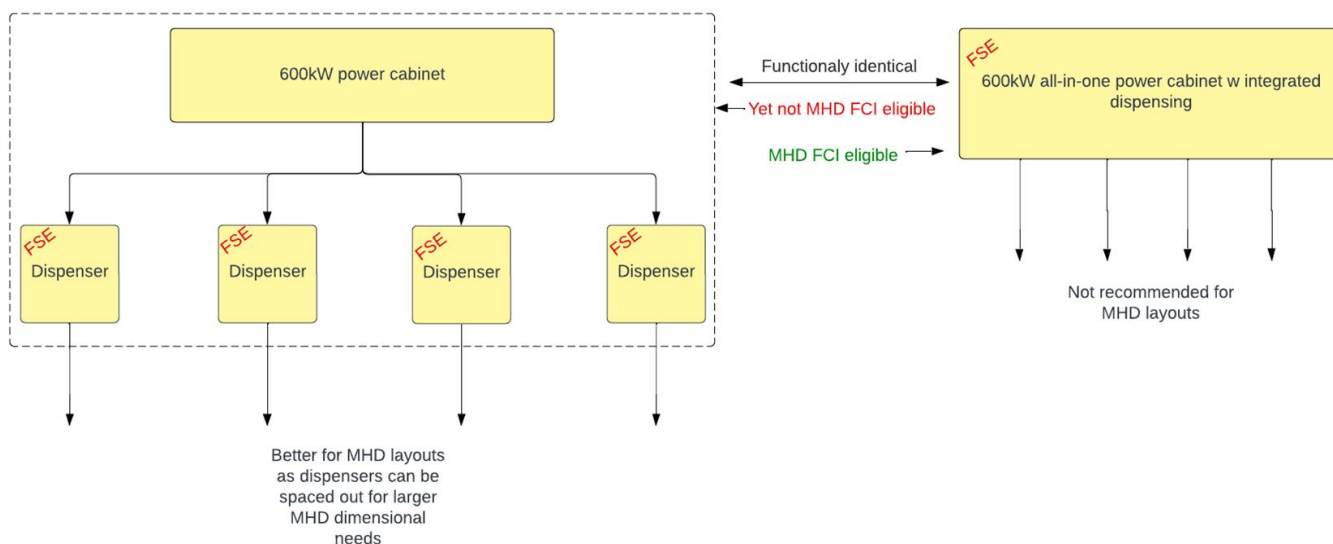


Figure 1 – Illustration of the issue caused by 250kW minimum FSE and 10 FSE maximum proposed rules in MHD-FCI

If the 250kW minimum FSE nameplate and maximum 10 count FSE per-site rules were to be adopted, it would create an unintended consequence where awkward, multi-port, all-in-one FSE designs qualify for MHD-FCI, but the functionally identical, and more ergonomic split-architecture alternatives would not. It is critical to not create this bias, as MHD layouts are significantly more sensitive to equipment placement and cable reach given the larger dimensions involved with these vehicles and the trailers that they are hauling. Site design varies widely based on MHD use case (dwell vs. corridor), and split-architecture infrastructure designs provide critical flexibility in our technology catalog for our customers. Simply removing the 250kW FSE minimum and 10 FSE maximum rules would solve the issue, while also allowing the market to self-determine how to best serve MHD fleet customers with the large-MW capacity platform of any given site.

Provide equal access to book-and-claim accounting for EV charging microgrids

We would also like to take this opportunity to reiterate the recommendations previously made by Prologis in earlier comments on revisions to LCFS, most recently in our letter dated February 20, 2024, regarding providing equitable access to book-and claim accounting for EV charging microgrids, as follows below, with one additional comment in red, as we are tracking additional technology pathways for producing hydrogen from biomethane.

Section §95488.8(i)(2)(A) states “*RNG injected into the common carrier pipeline in North America (and thus comingled with fossil natural gas) can be reported as dispensed as bio-CNG, bio-LNG, or bio-L-CNG, or as an input to hydrogen production, without regards to physical traceability.*”

MHD charging projects are in a difficult position: they are extremely capacity and energy intensive, second only to data centers in light-industrial real estate,² making them time-consuming to connect to the grid, yet they require accelerated schedules to meet fleet electrification mandates and avoid stranding EV assets. Projects in this predicament look to on-site generation with energy storage as a solution to meet fleet electrification objectives ahead of utility connections, with the added benefit of

² According to Prologis benchmarks of typical alternative uses for comparable properties

additional resiliency for critical fleet operations when the utility connection is eventually established in parallel. However, due to the exceptional energy intensity of industrial MHD charging projects on limited footprints, dispatchable power-dense on-site generation such as fuel cells or linear generators sometimes can be the only feasible technical solution that can fit the available real estate and meet the energy demand.

This important EV charging pathway for biomethane (whether RNG or hydrogen in its final delivered form for on-site generation) is not only a more energy efficient pathway for biomethane, but it also has significantly lower NOx emission profile than CNG vehicle application in sensitive disadvantaged communities around ports.³ Yet, only CNG vehicle fueling projects are incentivized with book-and-claim LCFS accounting from RNG energy sources.

As Prologis has recommended in prior comment letters, CARB should grant equitable access to biomethane book-and-claim LCFS accounting for MHD EV charging projects investing in on-site RNG/hydrogen generation that add resiliency and accelerate around transmission and distribution upgrade delays. We ask that CARB consider amending 95488.8(g)(1)(A)(2) to read as follows (changes in bold):

*“Biomethane supplied using book-and-claim accounting pursuant to section 95488.8(i)(2) and is claimed as feedstock in pathways for bio-CNG, bio-LNG, bio-L-CNG, hydrogen via steam methane reformation **or other methods, and electricity generation for co-located EV charging;**”*

Further, we suggest a revision of Section §95488.8(i)(2) to explicitly state:

*“(2) Book-and-Claim Accounting for Pipeline-Injected Biomethane Used as a Transportation Fuel or to Produce Hydrogen **or to generate Electricity**. Indirect accounting may be used for RNG used as a transportation fuel or to produce hydrogen **or to generate Electricity** for transportation purposes (including hydrogen that is used **either** in the production of a transportation fuel **or in the generation of electricity for transportation purposes**), provided the conditions set forth below are met:*

*(A) RNG injected into the common carrier pipeline in North America (and thus comingled with fossil natural gas) can be reported as dispensed as bio-CNG, bio-LNG, or bio-L-CNG, or as an input to hydrogen production, **or as an energy source for electricity generation**, without regards to physical traceability. Entities may report natural gas as RNG within only a three-quarter time span. If a quantity of RNG (and all associated environmental attributes, including a beneficial CI) is pipeline-injected in the first calendar quarter, the quantity claimed for LCFS reporting must be matched to natural gas sold in California as RNG no later than the end of the third calendar quarter. After that period is over, any unmatched RNG quantities expire for the purpose of LCFS reporting.*

*(B) Biomethane reported under fuel pathways associated with projects that break ground after December 31, 2029, injected into the common carrier pipeline, and claimed indirectly under the LCFS program for use as bio-CNG, bio-LNG, or bio-L-CNG in CNG vehicles or as an input to hydrogen production **or as an energy source for electricity generation** for transportation purposes, must demonstrate compliance with the following requirements:*

³ 0.059 gNOx/mile for a battery electric truck supported by linear generators vs. 0.317 gNOx/mile for a CNG truck per industry SME calculations provide to Prologis

*1. Starting January 1, 2041 for bio-CNG, bio-LNG and bio-LCNG pathways, and January 1, 2046 for biomethane used as an input to hydrogen production **or electricity generation**, the entity reporting biomethane must demonstrate that the pipeline or pipelines along the delivery path physically flow from the initial injection point toward the fuel dispensing facility at least 50 percent of the time on an annual basis. Entities may report natural gas as RNG within only a three-quarter time span. If a quantity of RNG (and all associated environmental attributes, including a beneficial CI) is pipeline-injected in the first calendar quarter, the quantity claimed for LCFS reporting must be matched to natural gas sold in California as RNG no later than the end of the third calendar quarter.*

After that period is over, any unmatched RNG quantities expire for the purpose of LCFS reporting.”

Prologis believes these recommendations will further enhance CARB’s proposed improvements to the LCFS program to align with the State’s transportation electrification goals and ensure they reflect the multiple use cases supporting logistics sector fleets, including both MHD-FCI Private and Shared charging, as well as address the realities of utility energization delays and resiliency risks for charging projects.

Thank you for considering our recommendations, and we welcome the opportunity to elaborate on our views with the Board and staff. Please do not hesitate to contact me at amoch@prologis.com or 571-895-5763 for more information or to discuss our comments in further detail.

Respectfully submitted,

Alexis Moch
Vice President, Government Affairs
Prologis



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THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

1500 K STREET NW | SUITE 650 | WASHINGTON DC 20005

May 10, 2024

RE: International Council on Clean Transportation comments on the **April 10th LCFS Workshop**

These comments are submitted by the International Council on Clean Transportation (ICCT). The ICCT is an independent nonprofit organization founded to provide unbiased research and technical analysis to environmental regulators. Our mission is to improve the environmental performance and energy efficiency of road, marine, and air transportation, in order to benefit public health and mitigate climate change. We promote best practices and comprehensive solutions to increase vehicle efficiency, increase the sustainability of alternative fuels, reduce pollution from the in-use fleet, and curtail emissions of local air pollutants and greenhouse gases (GHG) from international goods movement.

The ICCT welcomes the opportunity to provide comments on the Air Resources Board's Proposed Low Carbon Fuel Standard amendments. We commend the agency for its continued engagement and interest in continuing to improve the effectiveness of one of its flagship climate programs. The comments below offer a number of technical observations and recommendations for ARB to consider in aligning the program with the goals of the 2022 Scoping Plan. New analysis is based on the content presented in the April 10th workshop including modifications to the California Transportation Supply (CATS) model. We would be glad to clarify or elaborate on any points made in the below comments. If there are any questions, ARB staff can feel free to contact Nik Pavlenko (n.pavlenko@theicct.org).

A handwritten signature in black ink, appearing to read 'Stephanie Searle'.

Stephanie Searle, PhD
ICCT Chief Program Officer
International Council on Clean Transportation
stephanie@theicct.org

Summary of comments

The California Air Resources Board (ARB) presented additional analysis on their 45-day Low Carbon Fuel Standard (LCFS) proposal at their public workshop held on April 10th.¹ Staff reviewed different compliance trajectories to align the program with the 2022 Scoping Plan that were first presented in the December 2023 Initial Statement of Reasons (ISOR) report.² These include the proposed scenario (“45-Day Proposal”), Environmental Justice Advisory Committee (EJAC) scenario, and scenarios that include less and more stringent CI reduction trajectories. At the latest workshop, other adjustments were made to ISOR modeling including an updated feedstock supply curve for virgin and waste oils, updated combustion emission factors, and varying step-down rates in 2025 that maintain the proposed 30% CI reduction target in 2030.

Though ARB discusses the sustainability risks of biomass-based diesel in its 45-Day Proposal, the impact of its proposed sustainability certifications has not been modeled by ARB and there is no evidence that it will demonstrably mitigate growth in unsustainable compliance pathways. In these comments, we evaluate the scenarios and data released by ARB for the April workshop and compare it to program and market data. We compare the real-world growth of biomass-based diesel (BBD) and projected capacity announcements to ARB’s various modeled compliance scenarios. We review these assumptions and re-run the CATS model to project likely fuel volumes using an updated feedstock supply curve and conversion costs below.

In these comments, we also evaluate the proposed changes to the LCFS on the program’s inclusion of dairy biomethane-derived hydrogen, and the impact of the proposed set of deliverability requirements. We assess the potential for out-of-state digester projects to dilute the program’s intended impact on in-state methane emissions and transportation emissions goals.

We find that the discrepancies between ARB’s modeled scenarios and recent real-world data on BBD production are large and that ARB’s scenarios are not credible. When we rerun ARB’s model using updated data inputs, we find the proposed LCFS amendments will drive over a 600 million gallon to 1 billion gallon increase in BBD consumed in California relative to present-day consumption, which could cause unintended GHG emissions land use change and deforestation globally, undermining the intended impacts of the program. We also find that out-of-state biomethane production will significantly dilute the effectiveness of the LCFS in delivering genuine in-state GHG reductions.

Based on our technical analysis, we recommend that ARB:

¹ ARB, “California LCFS Workshop,” <https://ww2.arb.ca.gov/sites/default/files/2024-04/LCFS%20April%20Workshop%20Slides.pdf>.

² ARB, “Staff Report: Initial Statement of Reasons,” Public Hearing to Consider the Proposed Amendments to the Low Carbon Fuel Standard, December 19, 2023.

1. Address gaps in existing LCFS compliance modeling to evaluate the impact of more recent data on lipid supply and renewable diesel conversion costs on the potential market impacts and virgin vegetable oil demand of the LCFS.
2. Implement a cap on the volume of lipid-derived fuels credited under the LCFS program.
3. For all new biomethane-derived hydrogen pathways, implement geographic deliverability requirements within the next three years.

Review of ARB ISOR scenarios

The set of updated scenarios shared by ARB at the April LCFS workshop shed light on possible growth trajectories for biomass-based diesel (BBD), one of the fastest growing fuel pathways under the LCFS program. In 2023, BBD made up 61% of LCFS credits, up from only 8% in 2011.³ Renewable diesel capacity deployment in California has consistently exceeded predictions by the Energy Information Administration (EIA).⁴ Indeed, Murphy and Ro already updated their 2023 LCFS volume projections to account for higher-than-anticipated renewable diesel output and 1.7 billion gallons in additional nameplate capacity refinery conversions slated for this year.⁵

Evaluating the modeled projections for the program compliance under the LCFS revisions shared by ARB staff in April, it is clear that there is disagreement between the projections and the real-world data reported by ARB through 2023, as well as with the pace of renewable diesel capacity expansion in the U.S. reported by the EIA.⁶ Figure 1 below compares the reported volumes of renewable diesel consumed in California (shown in solid black) and the national-level, existing and announced renewable diesel capacity expansions to ARB's modeled scenarios (shown by the dotted line). Despite the significant drawdown of credits from the step-change and increase in compliance target, the scenarios modeled by ARB all project that renewable diesel consumption will abruptly stop growing starting in 2024, despite continued real-world expansion in refinery capacity to nearly 6 billion gallons by 2025. Based on this, we note that the scenarios may be structurally underestimating the program's impact on renewable diesel demand and therefore understating the risk of continued pressure on vegetable oil markets.

³ ARB, "Low Carbon Fuel Standard Reporting Tool Quarterly Summaries," accessed May 8, 2024, <https://ww2.arb.ca.gov/resources/documents/low-carbon-fuel-standard-reporting-tool-quarterly-summaries>.

⁴ U.S. EIA, "U.S. Renewable Diesel Capacity Could Increase Due to Announced and Developing Projects," July 29, 2021, <https://www.eia.gov/todayinenergy/detail.php?id=48916>.

⁵ Colin Murphy, "Updated Fuel Portfolio Scenario Modeling to Inform 2024 Low Carbon Fuel Standard Rulemaking," 2024, <https://doi.org/10.7922/G25719BV>.

⁶ U.S. Energy Information Administration, "Domestic Renewable Diesel Capacity Could More than Double through 2025," February 2, 2023, <https://www.eia.gov/todayinenergy/detail.php?id=55399>.

In particular, we highlight that the scenario in orange (which contains the auto-acceleration mechanism) increases credit prices significantly by raising the program’s ambition to a 39% target by 2030, yet it barely exceeds 2023 reported renewable diesel volumes, essentially limiting future growth of renewable diesel despite rapid increases in supply. In that scenario, credit prices increase rapidly to the cap of \$221/ton without a concurrent increase in renewable diesel consumption above present-day levels.

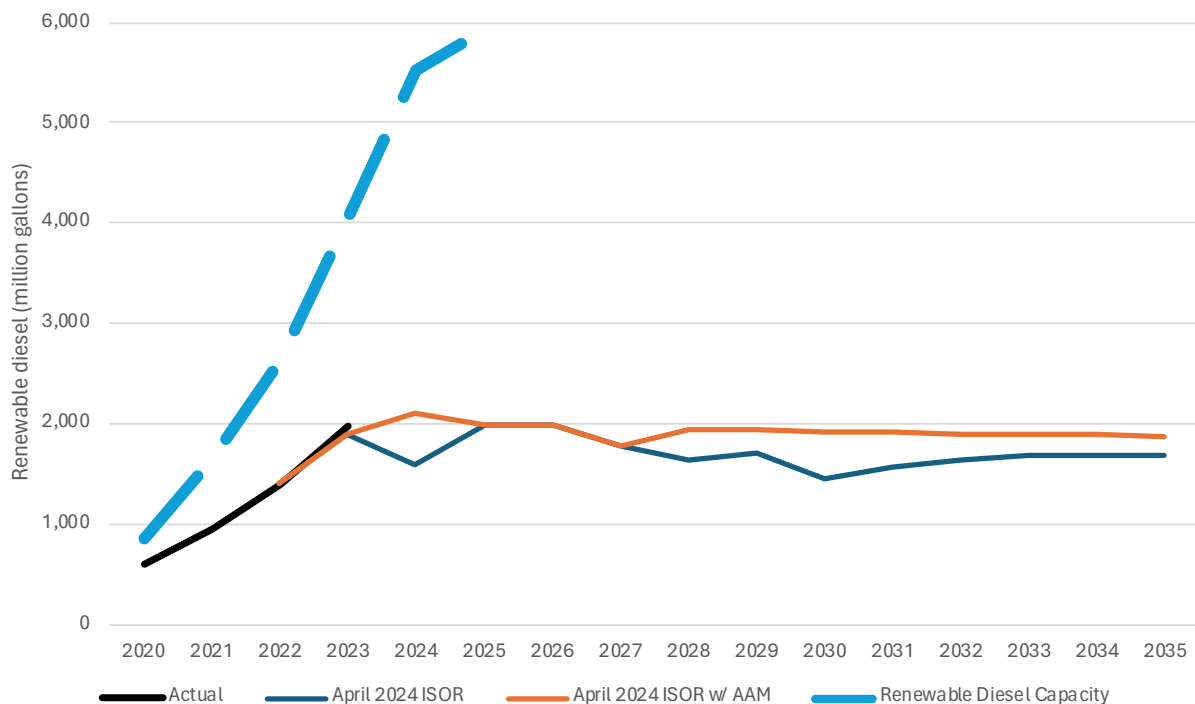


Figure 1: Actual and projected renewable diesel consumption compared to announced capacity

In the subsequent section, we adjust the CATS model developed by ARB to incorporate updated price and availability data for renewable diesel in order to evaluate the risk posed by the program of expanding reliance on soy oil.

Updates to LCFS compliance input assumptions

ARB presented updated supply curves for virgin vegetable and waste oils in their April 10th workshop slides. They report the availability of vegetable oils to be 8.4 million tons while the availability of waste oils is 5.8 million tons based on data calculated from EIA biofuel

production reports.⁷ Given that there is 13.6 million tons of soybean oil consumed in the U.S. today and this quantity is only anticipated to grow due to increased crushing capacity,⁸ ARB's data likely underestimates the availability of soybean oil as a BBD feedstock.

We develop our own supply curves by sourcing annual cost and supply data for soybean oil, yellow grease (i.e., used cooking oil), and tallow from the U.S. Department of Agriculture (USDA) Oil Crops Yearbook tables⁹. We consider the total quantity of soybean oil consumed in the U.S. rather than the quantity consumed in BBD due to the likely diversion of soybean oil from existing markets to the BBD sector to meet rising demand. Since the Oil Crops Yearbook does not report data on yellow grease consumption, we estimate this volume by converting the total volume of waste oil BBD consumed under the Renewable Fuel Standard (RFS) program¹⁰ to tons of feedstock assuming a conversion factor of 0.123 gallons of BBD per pound of waste oil.¹¹ Based on this dataset, the slope of our supply curve is slightly steeper for vegetable oils and flatter for waste oils compared to the input data used by ARB in their own modeling (Figure 2). This indicates that vegetable oil production is more responsive to changes in price while waste oil supply is similar to ARB's assumptions. Both of our supply curves are also shifted upward; thus, for a given feedstock price, a higher volume of feedstock is supplied relative to ARB's modeling.

⁷ U.S. Energy Information Administration, "U.S. Total Biofuels Operable Production Capacity," April 30, 2024, https://www.eia.gov/dnav/pet/pet_pnp_cabio_dcu_nus_m.htm.

⁸ U.S. Department of Agriculture, "Grains and Oilseeds Outlook for 2024" (Oilseeds, Feed Grains, Wheat, and Rice Interagency Commodity Estimates Committees, February 15, 2024), <https://www.usda.gov/sites/default/files/documents/2024AOF-grains-oilseeds-outlook.pdf>.

⁹ "USDA ERS - Oil Crops Yearbook," accessed May 8, 2024, <https://www.ers.usda.gov/data-products/oil-crops-yearbook/oil-crops-yearbook/>.

¹⁰ US EPA, "RINs Generated Transactions," Other Policies and Guidance, <https://www.epa.gov/fuels-registration-reporting-and-compliance-help/rins-generated-transactions>.

¹¹ Hui Xu et al., "Life Cycle Greenhouse Gas Emissions of Biodiesel and Renewable Diesel Production in the United States," *Environmental Science & Technology* 56, no. 12 (June 21, 2022): 7512–21, <https://doi.org/10.1021/acs.est.2c00289>.

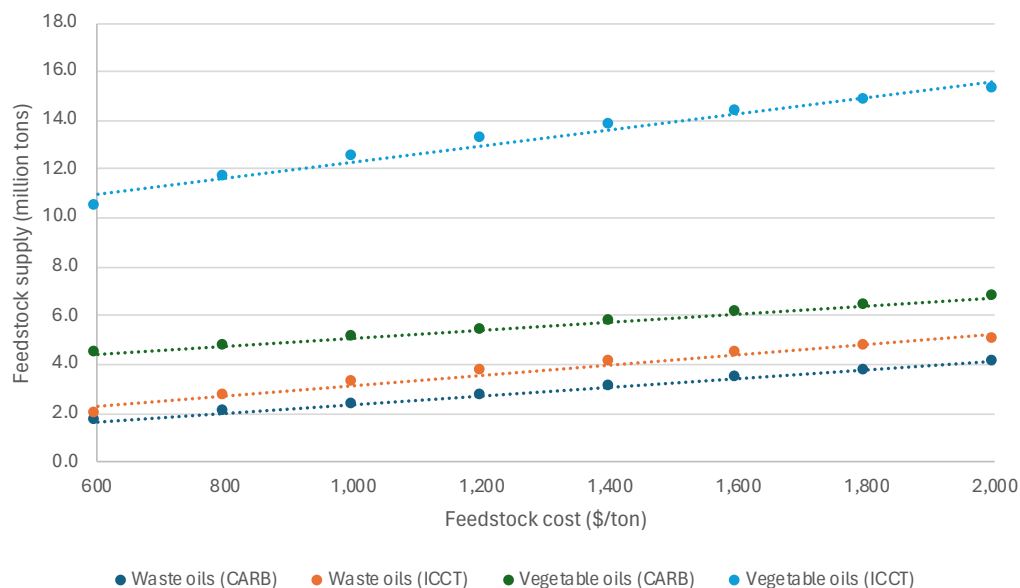


Figure 2: Feedstock supply curve comparison

We also update the conversion costs for renewable diesel and hydrotreated esters and fatty acid (HEFA) facilities, using real-world data. ARB's CATS modeling assumes that renewable diesel has a conversion cost of \$925-1122 per ton, significantly higher than the assumed FAME biodiesel conversion cost of \$106-383/ton in the model. This is inconsistent with the scientific literature as well as market data, which together suggest a lower production cost. Brown et al. (2020), Witcover and Williams (2020) and Pavlenko et al. (2019) estimate the levelized cost for hydroprocessed fuels, with estimates ranging from approximately \$3.50 to \$5.50 per gallon, adjusted for inflation.¹² In these studies, the cost of hydroprocessed fuels was driven primarily by feedstock prices, particularly at higher facility scales which benefit from economies of scale for CAPEX. Drawing from the analysis of Pavlenko et al. (2019), we estimate that the non-feedstock conversion costs alone were roughly \$350 per ton for soybean HEFA.¹³ To evaluate the impact on ARB's projections, we then input this value into CATS for soy renewable diesel, with a cost adjustment for waste oil conversion to account for lower yield. We re-ran the CATS model using these updated

¹² Nikita Pavlenko, Stephanie Searle, and Adam Christensen, "The Cost of Supporting Alternative Jet Fuels in the European Union." (Washington, DC: ICCT, 2019), https://theicct.org/sites/default/files/publications/Alternative_jet_fuels_cost_EU_2020_06_v3.pdf; Julie Witcover and Robert B. Williams, "Comparison of 'Advanced' Biofuel Cost Estimates: Trends during Rollout of Low Carbon Fuel Policies," *Transportation Research Part D: Transport and Environment* 79 (February 1, 2020): 102211, <https://doi.org/10.1016/j.trd.2019.102211>; Adam Brown et al., "Advanced Biofuels – Potential for Cost Reduction" (IEA Bioenergy, 2020), https://www.ieabioenergy.com/wp-content/uploads/2020/02/T41_CostReductionBiofuels-11_02_19-final.pdf.

¹³ Pavlenko, Searle, and Christensen, "The Cost of Supporting Alternative Jet Fuels in the European Union."

assumptions and present our results for the baseline scenario and baseline scenario with one AAM event triggered in Figure 3 below. Here, the volumes of renewable diesel actual consumption (in black) are compared to scenarios modeled by ARB in solid colors, as well as. The two projections generated from the adjusted CATS model are illustrated in the dotted lines).

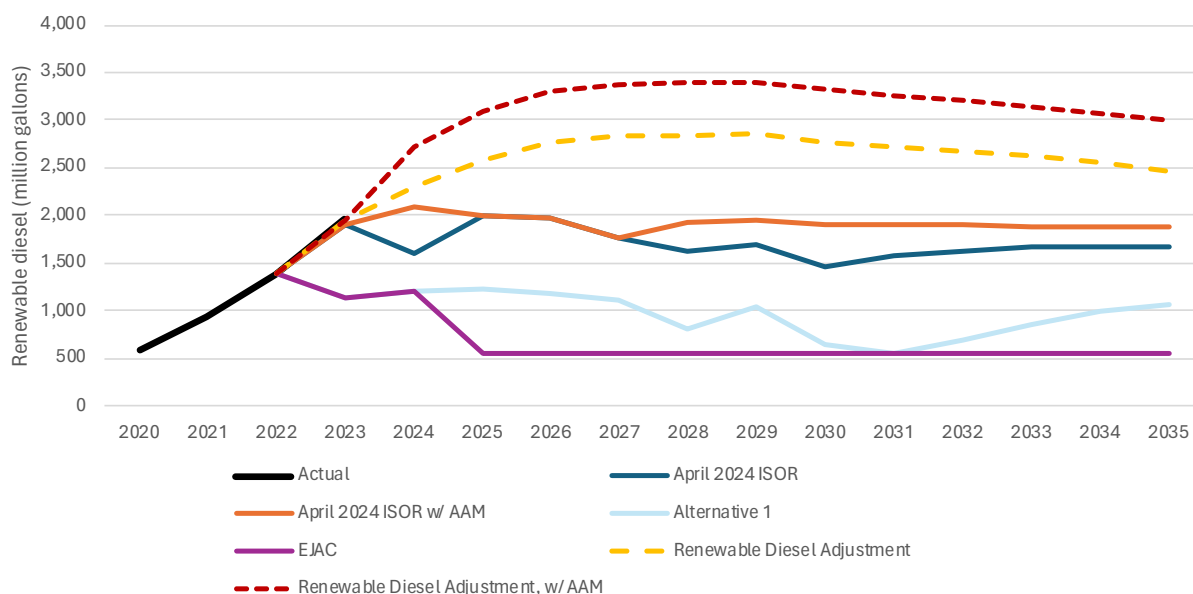


Figure 3: Renewable diesel volumes under proposed and ICCT-adjusted scenario runs

We find that renewable diesel consumption grows to 3.4 billion gallons under a scenario with the AAM triggered and 2.9 billion gallons without a change to the annual compliance trajectory. Comparatively, ARB’s modeling falls short of the actual volumes of BBD that were reported in 2023 in quarterly summary reports. For example, while ARB predicts that BBD consumption (including biodiesel and SAF) will not exceed 2.3 billion gallons under the 45-Day Proposal and 2.4 billion gallons if the AAM is triggered, actual consumption of BBD was already 2.3 billion gallons in 2023.¹⁴ While ARB concludes that current program design is sufficient to mitigate adverse environmental impacts from BBD consumption, we find that the emissions impacts of a rapidly growing BBD market are underestimated due to unrepresentative input assumptions.

Limiting California’s reliance on lipids is critical to ensure that the LCFS avoids unintended, indirect emissions that could jeopardize its intended GHG targets. BBD consumption presents significant sustainability concerns because it can be sourced from feedstocks grown on high-carbon stock land.¹⁵ BBD feedstocks grown on U.S. pasture and cropland

¹⁴ California Air Resources Board, “Low Carbon Fuel Standard Reporting Tool Quarterly Summaries.”

¹⁵ Hugo Valin et al., “The Land Use Change Impact of Biofuels Consumed in the EU: Quantification of Area and Greenhouse Gas Impacts,” August 27, 2015.

also lead to greenhouse gas (GHG) emissions impacts from direct land-use change (LUC) and to a greater extent when growing feedstocks for biofuel displaces the same feedstocks consumed in competing sectors including food, animal feed, and consumer products.¹⁶ Waste oils that are later converted to BBD do not directly contribute to LUC, but there is evidence of fraudulent reporting in the U.S. and elsewhere where virgin vegetable oil was miscredited as waste oil under regulatory fuel programs.¹⁷

Additional measures will be needed in the near-term to limit the supply of BBD entering the California market including imports from ecologically sensitive regions.¹⁸ One such measure is to set a cap on the volume of lipid-based feedstocks credited under the LCFS; this proposal was explored in previous ICCT research¹⁹ and has been implemented in similarly structured low-carbon fuel regulations in other countries, including Germany.²⁰ Though that analysis recommended a cap of approximately 1.2 billion gallons, lipid-based diesel consumption under the LCFS has already nearly doubled from 2021 levels. Therefore, a cap of approximately 2.3 billion gallons (similar to 2023 consumption levels) could maintain consistency between ARB's modeled scenarios without punishing existing producers.

This cap could be implemented in several ways:

- A) By introducing a separate credit registry for lipid-based fuels and limiting the quantity of credits sold to meet annual LCFS compliance, based on the predetermined volume cap. Developing separate credit registries for different fuel types would be analogous to the trade of Renewable Identification Numbers (RINs) under the federal Renewable Fuel Standard (RFS) program.
- B) By introducing a separate attribute, either energy or volume-based, as an allowance for the blending of lipids in California. Each obligated party would be limited according to the number of allowances they redeem, that represents to the maximum quantity of lipid-based fuel they can blend in a given year. These allowances could be allocated among obligated parties based on the volume of fuel

¹⁶ US EPA, "Renewable Fuel Standard Program (RFS2) Regulatory Impact Analysis," February 2010.

¹⁷ European Anti-Fraud Office, "The OLAF Report 2019," n.d.; U.S. Attorney's Office Eastern District of Pennsylvania, "Owners Of Lehigh Valley Companies And Their Engineer Charged In Green Energy Fraud Scheme," December 21, 2015, <https://www.justice.gov/usao-edpa/pr/owners-lehigh-valley-companies-and-their-engineer-charged-green-energy-fraud-scheme>; Eli Moskowitz and Mira Sys, "How Biofuels Scams Have Undermined A Flagship EU Climate Policy," OCCRP, July 4, 2023, <https://www.occrp.org/en/investigations/how-biofuels-scams-have-undermined-a-flagship-eu-climate-policy>.

¹⁸ ARB, "LCFS Pathways Requiring Public Comments," accessed May 8, 2024, <https://ww2.arb.ca.gov/resources/documents/lcfs-pathways-requiring-public-comments>.

¹⁹ Jane O'Malley et al., "Setting a Lipids Fuel Cap under the California Low Carbon Fuel Standard" (Washington, D.C.: International Council on Clean Transportation, 2022), <https://theicct.org/publication/lipids-cap-ca-lcfs-aug22/>.

²⁰ <https://germanlawarchive.iuscomp.org/?p=315>

sold in the California transportation market in by each obligated party in the previous year, or a set quantity of allowances equivalent to the cap could be awarded via auction.

Deliverability of biomethane-derived hydrogen

Data provided at the April workshop shows that ARB models a high reliance on dairy biomethane-derived hydrogen for its LCFS compliance. We find that by 2030, ARB's most ambitious scenario projects dairy biomethane-derived hydrogen will generate more credits than renewable diesel. The current book-and-claim system within the LCFS allows for indirect accounting of renewable natural gas (RNG) as long as it is injected into the North American natural gas grid. By virtue of the avoided methane emissions credit, this pairs high credit and compliance value with out-of-sector emissions reductions achieved at farms out of state. As a result, a hydrogen producer can purchase credits from an RNG producer, even when there is no direct, exclusive pipeline connection between the two facilities. The modeling does not distinguish between in state and out-of-state projects for dairy biomethane-derived hydrogen, thus making it difficult to determine to what extent future compliance will come from out-of-state projects.

Figure 4 provides an overview of existing dairy biomethane-derived hydrogen pathways certified under the LCFS by location, illustrating that 100% of these pathways in California are sourcing their biomethane from out-of-state digesters.²¹ While the stated benefit of this system is to support hydrogen deployment, this accounting system favors existing fossil-based steam methane reforming (SMR) technologies by pairing them with a tradeable certificate for an out-of-state project. The high policy value for this pathway does not support the technology transition in California to more advanced technologies, such as hydrogen production via electrolysis, which would support emissions reductions in the long term. At present-day LCFS credit values, dairy biomethane-derived hydrogen would generate over \$4 per kg, roughly 3 times the value of zero-CI electrolytic hydrogen produced from renewable electricity which would only generate approximately \$1.50/kg.²²

²¹ California Air Resources Board, "Current Fuel Pathways," n.d., https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/fuelpathways/current-pathways_all.xlsx.

²² Assuming an LCFS credit value of \$75/ton and an EER of 1.9 for the use of hydrogen in heavy-duty vehicle transport. Calculated via the LCFS credit price calculator. <https://ww2.arb.ca.gov/sites/default/files/2022-03/creditvaluecalculator.xlsx>

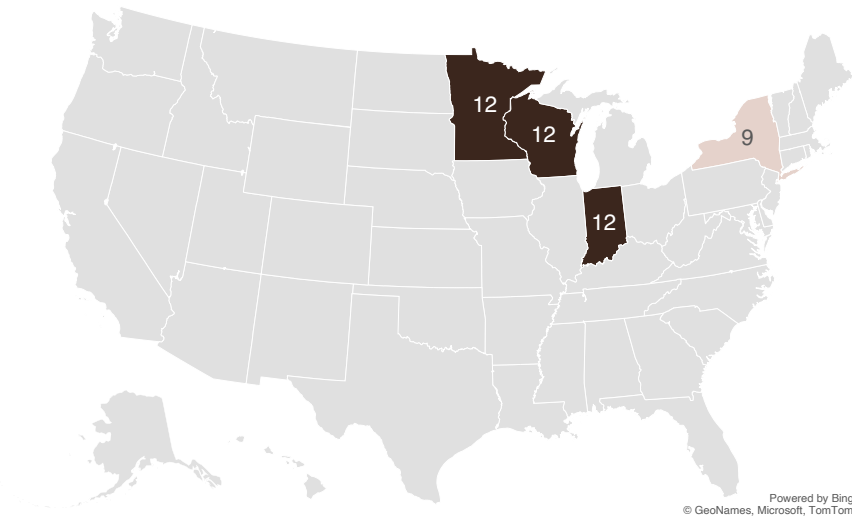


Figure 4: Geographic source of certified dairy RNG projects for hydrogen production in California.

Although deliverability requirements are proposed in the Initial Statement of Reasons (ISOR) released by ARB²³, they would only go into effect after January 1, 2046, for biomethane hydrogen projects that break ground after December 31, 2029. No deliverability requirements will be in effect for the projects that break ground before January 1, 2030.

To assess the potential risk to the LCFS, we draw upon data from the recently-published Census of Agriculture²⁴ to identify how many large-scale, centralized farms could be eligible to participate in the program. We chose 2,500 heads of cattle as a cut-off since this number represents profitable digester projects according to our previous assessment.²⁵ Figure 5 below illustrates the geographic distribution of these large farms across the country. Although California is home to around 31% of these farms nationwide, it is evident from the Census that there is a large pool of out-of-state farms (579 total) that could qualify for LCFS credits, though it is not possible to quantify their potential fuel production from the data. The Census data also indicates that California’s overall number of dairy farms of this size increased 17% between 2017 and 2022. Although installing digesters is a viable

²³ California Air Resources Board, “Staff Report: Initial Statement of Reasons,” December 2023, <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/isor.pdf>.

²⁴ U.S. Department of Agriculture, “Census of Agriculture, 2022 Census Volume 1, Chapter 1: State Level,” 2024, https://www.nass.usda.gov/Publications/AgCensus/2022/Full_Report/Volume_1,_Chapter_1_State_Level/.

²⁵ Jane O’Malley, Nikita Pavlenko, and Yi Hyun Kim, “2030 California Renewable Natural Gas Outlook: Resource Assessment, Market Opportunities, and Environmental Performance” (Washington, D.C.: International Council on Clean Transportation, May 22, 2023), <https://theicct.org/publication/california-rng-outlook-2030-may23/>.

method for methane mitigation, it may not result in overall, absolute emissions reductions if the dairy industry keeps growing in California.

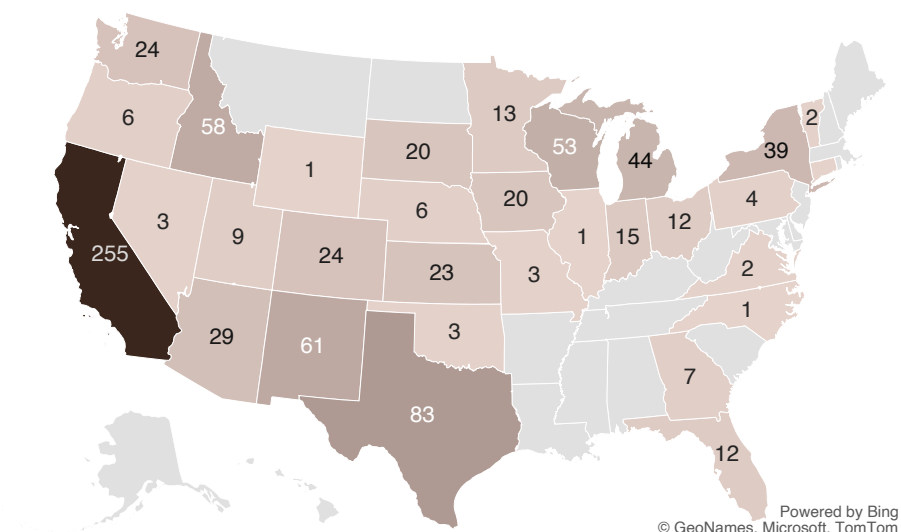


Figure 5: Distribution of dairy farms per state with dairy cattle head greater than 2,500.

Out-of-state swine farms capturing biogas could also take advantage of the generous LCFS credits. There are already several certified pathways for swine manure-derived RNG from Missouri being used as an offset for carbon intensity reductions for hydrogen production in California.²⁶ To show the risk from the swine farms, we considered farms with greater than 5,000 heads as cut-off since manure per head is lower for swine, and this is the highest range of data from the Census of Agriculture. Accordingly, there is a total of 3,540 swine farms of this size, and only 2 of them are in California.

Allowing compliance from a broad, nationwide pool of farms also poses risks to the value of LCFS credit markets. Though the higher targets and AAM proposed in the ISOR are intended to lift LCFS credit prices, there is a risk that this goal may be diluted by out-of-sector avoided methane emissions supported by separate policies. For example, dairy digester-sourced RNG procured from outside of California benefits from D3 RINs, which trade at above \$3 per ethanol-equivalent gallon and are insulated from recent price declines for other RIN categories.²⁷ This biomethane may also benefit from next year's 45Z Clean Fuel Production tax credit, which may award a further \$1 per gallon-equivalent. While this is no different from the combination of incentives available for other transport fuels eligible for the LCFS, it does indicate that the viability of these projects—and

²⁶ California Air Resources Board, "Current Fuel Pathways."

²⁷ <https://www.epa.gov/fuels-registration-reporting-and-compliance-help/rin-trades-and-price-information>

therefore, the attributability of avoided methane credits to the LCFS—is not solely attributable to the program and therefore an additional guardrail may be necessary.

In summary, the high compliance value of manure biomethane-derived hydrogen is inconsistent with its contribution to in-state methane reduction goals or transport sector decarbonization. The loose deliverability requirements will do more to facilitate the deployment of digesters in other states, rather than investment in hydrogen conversion technologies in California. The risk of moving forward with loose deliverability requirements is acute; there are hundreds of out-of-state dairy and thousands of swine farms that could take advantage of these incentives.

To mitigate these risks, we recommend that ARB establish a geographic deliverability requirement that connects dairy RNG directly to hydrogen producers in California as soon as possible. Therefore, we recommend that ARB align the deliverability requirements for biomethane used as a hydrogen feedstock with geographic deliverability requirements similar to those required for low-CI electricity to ensure better geographic correlation and focus support on pathways which tangibly reduce emissions in California. A simple geographic deliverability requirement will be more transparent, easier to implement, and is preceded by the deliverability requirements for low-CI electricity. Drawing from an analysis conducted by the U.S. Department of Energy (DOE) for 45V tax credit implementation, we recommend that ARB limit geographic eligibility for biomethane to the states of Washington, Oregon, and California, as this would be roughly consistent with the geographic deliverability for electricity proposed for 45V.⁵⁶ Alternatively, ARB can reference geographic zones from the U.S. natural gas transmission network to set its deliverability boundaries.⁵⁷

Submitted Comment

Name

Yaniv Scherson

Affiliation

N/A

Subject

Anaergia comments

Message

Four critical items should be changed to line with California state law and food, waste landfill diversion policy.

1. **Landfill Capture Rate:** Landfill capture rate of 75% (1997 EPA modeling study) must change to current value of 34% backed by latest and most accurate science (EPA 2023, Science, Nature, NASA/JPL).

Note: Canadian Fuel Regulations adopted a 36% landfill methane capture rate for Canadian clean fuel program.

Consequence: SB 1440 relies on negative CI to justify offtakes, inaccurate landfill capture rate hurts CI and hurts 1440 ability to accurately quantify GHG benefit to rate payers.

2. **Food Scraps Definition:** The definition of Food Scraps in CARB's tier 1 calculator must match Calrecycle definition of food waste. Should not exclude food waste generated from manufacturing, distribution facilities or any liquid form of food waste altogether.

Consequence: entire wastewater sector would be not be able to negative CI RNG even when taking food waste, thus not participate in LCFS or 1440.

Consequence: Generators that are regulated by 1383 won't benefit from low cost outlets to digesters because their feedstock has poor gas value (positive CI), like Amazon or Costco food distribution center.

3. **Methane Avoidance:** CARB should not arbitrarily eliminate methane avoidance for food waste by 2030. CARB should follow actual science of methane released from landfills and update capture rate to actual practice.

Consequence: eliminating methane avoidance immediately removes negative CI score even though landfills continue to emit methane, and kills food waste RNG projects with gas value so low projects fail economically.

4. **Decouple Legal Requirement:** Proposed text does not allow food waste to be considered landfill diverted if there is a law that says food waste must be diverted (even if food waste still goes to landfill). Remove this reference, and follow actual in-State destiny of food waste.

Consequence: in California food waste RNG will not be carbon negative because of the existence of SB 1383 law, irrespective if food waste continues to go to landfill.

image.png

File Upload (i.e., Attachments):

N/A

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May 9, 2024

The Honorable Liane M. Randolph, Chair
California Air Resources Board
P.O. Box 2815
Sacramento, California 95812

RE: Bayer Crop Science's Comments Relating to Climate Smart Agriculture and other Biofuel Issues raised by the Proposed Amendments to the Low Carbon Fuel Standard

Dear Chair Randolph:

Bayer Crop Science (Bayer) appreciates the current and historic efforts by the California Air Resources Board (CARB) to reduce the greenhouse gas (GHG) emissions from transportation through the implementation of the State's Low Carbon Fuels Standard (LCFS). Bayer supports the continued evolution of the LCFS through the CARB rulemaking process. Of particular interest to Bayer is the production of biofuels in the most sustainable manner.

In 2018, the Intergovernmental Panel on Climate Change (IPCC) published a Special Report on the impacts of a 1.5°C global warming above pre-industrial levels. This report found that achieving global carbon neutrality by mid-century is critical to avoiding the most catastrophic impacts of climate change.¹ Moreover, the IPCC Sixth Assessment identified land-based emissions mitigation as "the only [sector] in which large-scale carbon dioxide removal may currently and short term be possible" and that it is "crucial to limit climate change and its impacts."² The latest science finds that it is increasingly likely that the 1.5°C target will be exceeded³ and that large-scale GHG reductions are critical to meeting any state or global target.⁴

Already a leader in the response to climate change, CARB's 2022 Scoping Plan Update details sector-by-sector roadmaps for California to achieve carbon neutrality by 2045 or earlier. One critical roadmap is for the aviation sector, where the scenario includes a transition of 20 percent of aviation fuel demand to zero-emission technologies by 2045 and sustainable aviation fuel (SAF) for the other 80 percent.⁵

The agriculture sector can play a significant role in helping California meet the goal of generating SAF and achieving LCFS carbon intensity (CI) standards. Viable practices to significantly reduce CI include optimizing fertilizer

¹ IPCC, 2018: Summary for Policymakers. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 3-24, <https://doi.org/10.1017/9781009157940.001>.

² Nabuurs, G.-J., R. Mrabet, A. Abu Hatab, M. Bustamante, H. Clark, P. Havlík, J. House, C. Mbow, K.N. Ninan, A. Popp, S. Roe, B. Sohngen, S. Towprayoon, 2022: Agriculture, Forestry and Other Land Uses (AFOLU). In IPCC, 2022: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. <https://doi.org/10.1017/9781009157926.009>.

³ Mathews, D.H., Wynes, S. (2022) Current global efforts are insufficient to limit warming to 1.5°C. *Science* 376 (6600) 1404-1409. <https://www.science.org/doi/10.1126/science.abo3378>

⁴ Mace, M.J., Fyson, C.L., Schaeffer, M., Hare, W.L. (2021) Large-Scale Carbon Dioxide Removal to Meet the 1.5°C Limit: Key Governance Gaps, Challenges and Priority Responses. *Global Policy* 12 (51) 67-81. <https://doi.org/10.1111/1758-5899.12921>

⁵ CARB (2022) 2022 Scoping Plan for Achieving Carbon Neutrality. <https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf>



application, reducing tillage, using enhanced-efficiency fertilizers, double-cropping and planting cover crops. Collectively, these practices have the potential to reduce the CI of fuels by more than 40 g CO₂e/MJ.⁶ These practices are not limited to their GHG-reducing benefits; they also provide “additional ecosystem service benefits, including watershed protection, increased biodiversity, and improved soil health and fertility.”⁷ Carbon sequestration in agriculture presents one of the greatest potential mitigation sources. IPCC’s 2024 Summary for Policymakers identified this strategy as one of the top five mitigation options in the near term with the sequestration potential of approximately 3.4 GtCO₂-eq/yr by 2030.⁸

About Bayer Crop Science

Bayer is a global enterprise with core competencies in the life science fields of health care and crop science. Bayer’s products and services are designed to help people and the planet thrive by supporting efforts to master the major challenges presented by a growing and aging global population. Bayer is pioneering farming solutions that accelerate the decarbonization of the food, fuel and agricultural supply chain and is supportive of policy development that recognizes the potential of climate-smart agriculture as an effective lever for achieving these goals.

Support for the reduction of impacts of agricultural practices in feedstock production

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With reference to slide 58 of the presentation from the April 10 workshop, we support the need to “[r]educe other impacts of agricultural practices in feedstock product.” To meet this goal, CARB should continue to ensure that the fuels used in the LCFS program are produced in the most sustainable manner. We advocate for rigorous accounting methods that quantify the GHG emissions from crop-based feedstocks. We encourage CARB to incentivize the production of low carbon feedstocks. Corn, soybeans, canola and other crops can be grown on a wide range of soils using a variety of farming techniques and inputs that significantly impact the CI of those fuels. CARB’s best opportunity to support the use and expansion of these practices is to accurately reflect the GHG benefits in the CI scores of the fuels produced from the lowest carbon feedstocks.

Recommendation to Analyze and Develop Focused Reports on Climate-Smart Agriculture

168.2

We recognize that this is a rapidly evolving and complex area. To best integrate farming practices and climate-smart agriculture into the LCFS program structure, we encourage the Board to direct staff to dedicate time and resources to analyze the GHG reduction opportunities for crop-based feedstocks and report back to the Board. We would recommend that an initial report be presented to the Board by the end of 2025, and a final report by the end of 2026. This timeline is proposed to coincide with the proposed new LCFS regulatory requirement pursuant to section 95488.9(g)(1)(A) that all crop-based and forestry-based feedstocks used for LCFS fuel pathways must maintain continuous third-party sustainability certification with an original certification completed before January 1, 2028. The focused research, analysis, and reporting by CARB staff that will be necessary to develop the reports to the Board and also will inform CARB staff’s and the Board’s review of certification systems. This process will provide the foundation for potential future modifications to the LCFS regulations and CA-GREET to recognize climate-smart agricultural practices with the next update of the LCFS regulations.

In the interim period before January 1, 2028, we are requesting that the Board encourage CARB staff to consider and potentially evaluate Tier 2 pathways to credit climate-smart farming practices that enable feedstock to be produced in a less carbon intensive manner. In addition, we encourage CARB to allow the crediting of higher yields than the defaults in the GREET calculator, as well as indirect benefits potentially attained from producing oilseeds on fallow acres (e.g. negative land use change values as has been documented in published, peer reviewed studies.). We recommend that the total feedstock CI reduction for a qualifying fuel pathway be based on the aggregate net reduction achieved for all the farming practices as compared to the Tier 1 CA-GREET calculator standard value for these feedstock CI components.

⁶ Liu, X. et. al. (2020) Shifting agricultural practices to produce sustainable, low carbon intensity feedstocks for biofuel production. *Environ. Res. Lett.* <https://doi.org/10.1088/1748-9326/ab794e>

⁷ *ibid.*

⁸ IPCC, 2023: Summary for Policymakers. In: *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, pp. 1-34, doi: 10.59327/IPCC/AR6-9789291691647.001, at p. 27, figure SPM.7.



Feedstock Sustainability Certification

Bayer supports CARB's recognition of the important role that crop-based biofuels play in reducing GHG emissions and appreciates CARB's decision to reject an arbitrary cap on crop-based fuels. As previously noted, CARB is proposing that all crop-based feedstock used for LCFS fuel pathways must obtain third-party sustainability certification by January 1, 2028, under an approved certification system. Bayer is committed to strong sustainability provisions; however, we have significant concerns regarding CARB's current open-ended proposal to require third-party "sustainability certifications" for crop-based feedstocks.

At Bayer, we are committed to agriculture solutions for today and tomorrow. We support farmers as they work to optimize their fields, care for their land, and contribute to the climate solution. Through Bayer's digital platform ForGround, we are striving to make the adoption of regenerative agriculture practices, like reduced tillage and cover crops, easier for farmers across the country. Through these practices farmers can support their long-run soil health, create more resilient crops, reduce erosion, and increase soil water availability for their crops. Critically, these practices also sequester carbon in soil and are critical to producing sustainable agricultural biofuel feedstocks.

168.3 We believe the provisions under section 95488.9(g)(1)(B) are too vague, and insufficiently aligned with LCFS program goals. Additionally, it is unclear why only crop and forestry-based fuels are required to meet social and economic
168.4 criteria, as these same criteria could equally apply to other fuel pathways participating in the program. These additional
168.5 criteria have the potential to add substantial administrative burdens to both farmers and fuel producers, potentially creating barriers to participation in the LCFS, and as such should be carefully considered in the context of what the program hopes to achieve with these criteria.

168.6 Therefore, we respectfully recommend that this portion of the proposed regulatory structure undergo significant additional review and development prior to being integrated into the LCFS regulation. Based on our own experiences in the creation and development of new business models for CSA, we would like to offer the following perspectives and recommendations:

- Program requirements should be informed by farmers and their associations who have the best on-the-ground understanding of ways to improve soil health within a given soil type, cropping system, or geography.
- CARB should do outreach, hold dedicated workshops, and provide the opportunity for multi-stakeholder input and workshop feedback to align substantive LCFS requirements with specific LCFS goals and to make the sustainability provisions practicable.
- In the process of determining whether specific sustainability criteria should be imposed on crop-based feedstocks, CARB should simultaneously determine how to best integrate climate-smart agriculture practices to be credited under the LCFS. While these climate-smart practices represent significant additional effort and cost on the part of the farmer to learn and implement, they can bring significant GHG emissions reductions, as recognized by the U.S. Department of Agriculture, the National Academy of Sciences, the IPCC, and others.⁹ Therefore, these practices should be incentivized through crediting to drive adoption of these important practices.
- CARB should consider the indirect benefits potentially attained from producing oilseeds on fallow acres. Feedstocks from crops which grow between rotations of primary crops, and act as a functional cover crop, should be afforded negative land use change values in the updated LCFS. Feedstocks from these new crops are incremental, additive sources of feedstock without driving any land use change. Additionally, processing of

⁹ J. Rosenfeld, J. Lewandrowski, T. Hendrickson, K. Jaglo, K. Moffroid, and D. Pape, 2018. A Life-Cycle Analysis of the Greenhouse Gas Emissions from Corn-Based Ethanol. Report prepared by ICF under USDA Contract No. AG-3142-D-17-0161. September 5, 2018. 7. National Academies of Sciences, Engineering, and Medicine. 2019. Negative Emissions Technologies and Reliable Sequestration: A Research Agenda. Washington, DC: The National Academies Press. doi: <https://doi.org/10.17226/25259>. Nabuurs, G.-J., R. Mrabet, A. Abu Hatab, M. Bustamante, H. Clark, P. Havlík, J. House, C. Mbow, K.N. Ninan, A. Popp, S. Roe, B. Sohngen, S. Towprayoon, 2022: Agriculture, Forestry and Other Land Uses (AFOLU). In IPCC, 2022: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926.009.



168.7 cont.

these crops adds other materials, such as animal feeds, into our economy that help to decrease the risk of land use changes globally.

By focusing on what the State of California seeks to achieve through additional sustainability criteria, and delineating those criteria with appropriate inputs, CARB can ensure that program requirements are fit for purpose, clear, transparent, applied fairly across feedstocks and fuel production processes, properly credit GHG emissions reductions from agricultural feedstocks, and align with LCFS-specific program goals. And such a process need not take long, as CARB could set up a process with a specified time frame (e.g., six months) as it has in other instances where program requirements need to be refined.

The Imperative of Dramatically Expanding the Supply of Sustainable Aviation Fuel Underscores the Importance of Policy that Leverages GHG Reductions from Climate-Smart Agriculture

168.8

The Biden Administration launched the SAF Grand Challenge three years ago to inspire a dramatic increase in the production of SAF to at least 3 billion gallons per year by 2030.¹⁰ Subsequently the 2022 Inflation Reduction Act (IRA) established a federal tax credit of \$1.25-\$1.75 per gallon under section 40B for SAF that attained a CI reduction of at least 50% (SAF Tax Credit). Just last week, the Department of Treasury and the Internal Revenue Service issued a series of guidance documents including Notice 2024-37 for the SAF Tax Credit.¹¹ This Notice introduced the U.S. Department of Agriculture's (USDA) Climate Smart Agriculture Pilot Program (CSA Pilot Program). The objective of the CSA Pilot Program is to provide farmers with the opportunity to achieve greater emissions reductions pursuant to the 40BSAF-GREET 2024 model. The CSA Pilot Program provides specific and certifiable farming practices that can be implemented by domestic soybean and domestic corn feedstock producers. The benefit to farmers of implementing and certifying the use of these practices is to open the door to SAF Tax Credits and resulting revenues.

California has similarly established the expansion of SAF as a priority goal for the State. Governor Newsom has targeted 20% clean fuels adoption in the aviation sector.¹² The Legislature has estimated a need for at least 1.5 billion gallons of SAF blending by 2030.¹³ Moreover, in order to fulfill California's goal of achieving carbon neutrality by 2045, the 2022 CARB Scoping Plan states that 80% of all aviation fuel demand will need to come from SAF by 2045.¹⁴ These California goals are aligned with the federal government's SAF Grand Challenge. We encourage CARB to consider the USDA CSA Pilot Program and the certification recognized therein. While the pilot program will need adjustments regarding the bundling of climate-smart practices and crops included, it does recognize the opportunity of climate-smart agriculture practice's ability to unlock additional GHG reductions and expand the availability of SAF. It also sets a standard for certification and record keeping documentation which warrants evaluation as a reference point for potentially establishing a similar California program. By evaluating existing programs like the USDA CSA Pilot Program, or the Renewable Fuel Standard (RFS), CARB could permit some level of aggregate compliance. This approach would streamline compliance requirements for feedstocks from regions with proven sustainability practices, aligning with existing regulatory frameworks while ensuring environmental integrity and reducing the administrative burden for farmers.

168.9

¹⁰ The White House, "FACT SHEET: Biden Administration Advances the Future of Sustainable Fuels in American Aviation," (September 9, 2021), available at <https://www.whitehouse.gov/briefing-room/statements-releases/2021/09/09/fact-sheet-biden-administration-advances-the-future-of-sustainable-fuels-in-american-aviation/>

¹¹ <https://www.irs.gov/pub/irs-drop/n-24-37.pdf>

¹² See California Office of the Governor, Governor's Letter to Chair Randolph. July 22, 2022.

<https://www.gov.ca.gov/wp-content/uploads/2022/07/07.22.2022-Governors-Letter-to-CARB.pdf?emrc=1054d6>

¹³ See AB1322 (Rivas) available at

https://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=202120220AB1322. AB 1322 was passed by the California assembly in 2022 and later vetoed by Governor Newsom, who, in his veto letter, supported the legislature's intent with the bill and ordered CARB to develop a "plan to reduce greenhouse gas emissions through the production and use of sustainable aviation fuels by July 1, 2024". Governor Newsom's veto letter available at <https://www.gov.ca.gov/wp-content/uploads/2022/09/AB-1322-VETO.pdf?emrc=7598b6>

¹⁴ See CARB, 2022 Scoping Plan for Achieving Carbon Neutrality. December 2022.

https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp_1.pdf. Page 73. The Scoping Plan scenario envisions 20% of aviation fuel demand met by electricity (batteries) or hydrogen (fuel cells) in 2045, with sustainable aviation fuel meeting the remaining 80%.

**Conclusion**

CARB has been an international leader in developing and implementing programs to reduce GHG emissions across the California economy. The inclusion of climate-smart agricultural practices will continue the State's leadership throughout the country, especially in the Midwest where a large portion of the corn and soy are grown that provide the feedstocks used to produce a large portion of the low carbon liquid fuels that enable attainment of LCFS CI reduction standards. We thank CARB for this opportunity to offer these comments and look forward to continued collaboration to implement policies and strategies that further reduce emissions from the transportation sector.

Sincerely,

A handwritten signature in black ink that reads "Chelsey Robinson".

Chelsey Robinson

Director, North America Sustainability; Agriculture Affairs
Bayer Crop Science



May 10, 2024

Rajinder Sahota, Deputy Executive Officer
Climate Change and Research
California Air Resources Board
1001 I Street Sacramento, CA 95814

Dear Ms. Sahota:

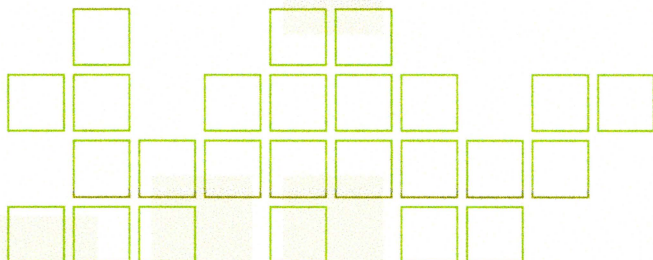
I am writing on behalf of Nuseed and our support of the Air Resources Board's amendments to the LCFS and specifically in response to the Workshop on April 10th.

Nuseed is a global agriculture innovator enabling the transformation of select crops into renewable and traceable sources of lower-carbon energy, and plant-based nutrition. Nuseed's proprietary solutions like our Omega-3 canola and our Carinata product, an intermediate winter oilseed, contribute to solving global challenges like food security, human nutrition, and climate change. Nuseed empowers growers and end-use customers to rapidly scale today to meet current and emerging demand for generations to come.

Established in 2006, Nuseed has 10 locations in Australia, Europe, North America, and South America, including three proprietary innovation centers (one of which is in Northern California), more than 400 employees, and sales in more than 30 countries. Nuseed is the seed technologies platform of Nufarm Limited (ASX:NUF)

Executive Summary

- Biofuels are a successful and critical element of the LCFS and have demonstrated their place in the state's effort to address climate change and decarbonize the fuel supply.
- UCO and waste-based feedstocks need proper oversight and governance lest the entire system lose credibility and the market falter, threatening achievement of any additional environmental and climate outcomes;
- The sustainability criteria being developed must have a robust, consistent, and standardized system of ensuring that emission reductions are real, calculations and claims are robust and the program defensible. Each feedstock regardless of origin should have the opportunity to compete on a level playing field and for their unique characteristics to be considered in determining CI and LCFS value.



- Intermediate Crops need to be recognized for what they are, a novel class of crops that do not fit into the current federal classifications but which can deliver significant carbon reduction potential for transport fuels along with net-positive societal benefits (i.e., zero or even negative impact to land use demand, positive rural development, soil carbon sequestration, carbon-neutral or carbon-negative fuel, and air quality benefits under the LCFS).

Low-carbon liquid fuels are a critical component of decarbonizing transport.

We appreciate and recognize the significant amount of time, energy and effort by all (staff and stakeholders) to develop the proposed changes to the LCFS program in accordance with the adopted scoping plan. As we have stated previously, while others may wish to single out certain items or proposals as lacking and needing changes or adjustments, we recognize and acknowledge that the overall proposal significantly improves air quality, reduces carbon loading and positively impacts climate change.

The myriad comments that seek to discredit the important role of biofuels are *not* supported by science or (as ARB staff have noted) the nearly 20 years of hard data compiled on air quality and GHG emissions improvement in California by ARB and across the US by the US Environmental Protection Agency. Simply put, we agree and support the ARB's efforts to emphasize that biofuels do work at delivering real, meaningful GHG and carbon reductions today. In fact, for certain difficult to decarbonize areas like marine or aviation, biofuels like sustainable aviation fuel (SAF) are the only realistic and meaningful option available today and in the near future.

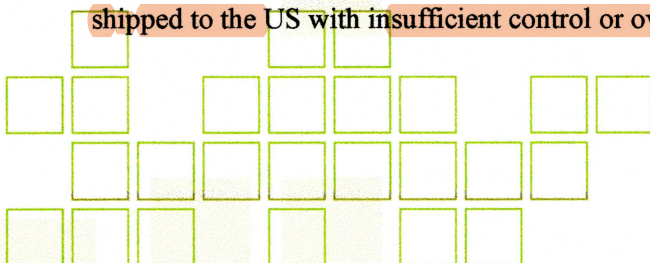
There were several important issues and topics discussed at the April 10th workshop for stakeholders to respond. Nuseed would like to focus our comments on two important items covered in the workshop: provisions to encourage waste-based feedstocks and sustainability.

Waste-based feedstocks

Staff discussed the important role that waste-based feedstocks (mainly used cooking oil, or UCO) have played (and will continue to play) in growing the renewable diesel consumption numbers across the state. However, other than a mention of classifying waste-based feedstocks as specified source material and that those feedstocks must provide chain-of-custody documentation, there was no significant discussion of improving enforcement of audit and verification standards in this area.

As demand for biofuel has grown in California so has the demand of waste-based material UCO from Asia. However, a cursory look at volumes shipped over the last 3 years shows a rapid increase in material shipped to the US with insufficient control or oversight, raising the real prospects of material like virgin

170.1



palm making its way into the UCO supply destined for the US¹. Simply banning palm as ARB staff have proposed in the proposed amendments [§ 95482 (f), page 34 of Appendix A-1] is not enough. The same rigor in audit and verification applied to crop-based feedstocks *must* be applied to the audit and verification process for UCO. Given the majority of UCO is aggregated after collection at restaurants by a variety of companies in the supply chain, audits of attestations alone are completely inadequate; verification of all entities and transaction across the supply chain must extend upstream to the point of original collection in order to instill market confidence that underpins the LCFS program. Auditors must be required to implement random spot audits of collection facilities domestic and abroad. All biofuel feedstocks and end products should be subject to the same stringent requirements if the market itself is to deliver its intended outcomes.

Sustainability

The concepts proposed in the workshop around sustainability are notable and important in several ways; however, the concepts raise a number of questions and highlight that significant gaps still exist in the policy framework. For example, the discussions around sustainability² seem mainly focused on increasing waste-based feedstocks and/or reducing the impact of crop-based feedstocks. These concepts glaringly miss a clear and obvious alternative: new intermediate crops grown on otherwise fallow lands to produce renewable fuel feedstocks.

Intermediate Crops like carinata, camelina, or covercress carry real, measurable and verifiable climate-smart environmental benefits and offer the opportunity to produce dedicated energy crops without impacting existing farm rotations that provide food, feed and fiber for consumers globally. These crops are grown between main-crop rotations on existing land that would otherwise be idle or fallow. Data suggests that less than 10% of eligible acres in production across the United States currently use cover cropping, highlighting the growth potential of these crops without impact to existing crops. These Intermediate Crops offer similar soil health benefits and increased carbon sequestration compared to traditional cover crops. Further, as the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) has demonstrated, Intermediate Crops can also be harvested to provide ultra-low carbon feedstocks that easily rival those associated with UCO and other limited-availability waste-based feedstocks.

¹ <https://www.bloomberg.com/news/articles/2024-05-07/suspicious-frying-oil-from-china-is-hurting-us-biofuels-business>

² See April 10, staff presentation slide 58, "Guardrails Include Multiple Mechanisms"

If ARB is to be successful in expanding feedstocks beyond the traditional crop-based products available, it is imperative to recognize and expand the production of novel feedstocks like intermediate crops that have the potential to meet both the environmental goals of the LCFS and the economic needs of renewable energy producers without disrupting the ability to provide biofuels to the state of California.

In the case of carinata, Nuseed and its predecessors have been researching and developing new varieties for over a decade and have been selling seeds in a closed loop system in the US and South America for several years. Further, Nuseed has been working with a number of regional and international organizations³ around sustainability and we have developed a variety of standards and audits for our carinata crop across all our production areas.⁴

170.2

At a minimum, we would ask CARB to add intermediate crops as a listed compliance strategy⁵ and allow the utilization of intermediate cover crops like Carinata similar to the actions taken by the European Union as adopted in recent changes to Annex IX of its Renewable Energy Directive. Inaction would cede usage and development of these crops and, more importantly, the oil derived from them to European refiners and European aviation markets, thus impacting the ability to deliver our shared commitment to deep decarbonization of fuels in California and across the United States.

170.3

Beyond the need to address Intermediate Crops, the staff proposals around audit and verification reference leveraging existing certification programs.⁶ While this makes sense on its surface, it is important to note that not all certification programs are created equal nor do they all measure sustainability in a consistent manner. Additional work must go into further defining what constitutes adequate demonstration of sustainability criteria. Further, a number of details have yet to be identified as to how ARB staff would oversee the implementation of a certification scheme. Will this become a part of the pathway certification process or the audit and verification activities? Will existing staff, who are already taxed to workload limits, have sustainability activities added to their jobs, or will new staff be hired and dedicated to the process?

Given the extent to which ARB's sustainability provisions could impact a large and diverse segment of US farmers and acknowledging that ARB may lack academic and practical experience with such programs, establishing a pilot program prior to 2028 may prove useful.

An early pilot system would allow ARB staff to review processes, build knowledge, develop a better understanding of US agronomy practices and develop program recommendations prior to instituting the

³ Southeast Partnership for Advanced Renewables from Carinata SPARC; University of Florida; University of Georgia; the Roundtable for Sustainable Biomaterials RSB; The International Civil Aviation Organization ICAO

⁴ As we are in a competitive market and a number of our systems are proprietary, we will be detailing our work with RSB, our sustainability program including audits and certification, as well as target markets, acreage growth and projections in additional correspondence as confidential business information.

⁵ Staff presentation slide 58

⁶ Staff presentation slide 60



concept for all of US agriculture. As noted, intermediate crops are sold and grown by US farmers today, with active data collection and, in many cases, verification to a prescribed set of standards. Our segment could be an ideal candidate for concept testing. We look forward to exploring this concept further with ARB staff.

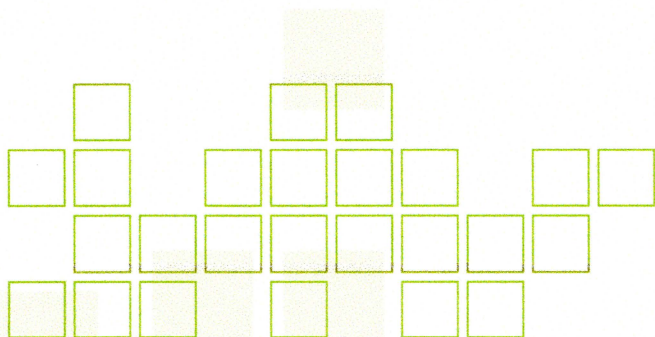
170.4 Lastly, we would like to highlight that any proposal focused on feedstock sustainability which does not also include provisions focused on rewarding Climate Smart agricultural practices, is akin to ignoring a helping hand while one struggles to lift a heavy object (or solve a critical problem). As we have stated in previous correspondence, as CARB looks to allow innovative ways to sequester carbon, like direct air capture, the agency should also embrace data driven climate smart agriculture. Practices which enhance carbon retention in the soil at the farm scale deserve the same recognition and treatment as CCS, especially given the reality that those practices are less costly, equally measurable and verifiable, and cumulative (compounding over time).

Finally, it bears repeating again, we recognize the significant amount of time, energy and effort by all in developing the proposed changes to the LCFS program. We firmly believe the Board should commend the Staff for the work they have done and the commitment they have made to the program.

Sincerely,

A handwritten signature in blue ink, appearing to read "Scott R. Hedderich", written over a horizontal line.

Scott R. Hedderich
North America Policy and Government Affairs Director





Margaret C. Campbell
Assistant General Counsel

Delta Air Lines, Inc.
Law Department 981
1030 Delta Boulevard
Atlanta, GA 30320

May 10, 2024

Submitted via
[Low Carbon Fuel Standard Workshop, April 10, 2024 | California Air Resources Board](#)

Clerks' Office
California Air Resources Board
1001 I Street
Sacramento, California 95814

Re: Opposition to California Air Resources Board (CARB) Proposal to Regulate Jet Fuel

Dear Chair Randolph:

Delta Air Lines participated in CARB's Low Carbon Fuel Standard (LCFS) workshop held on April 10th, 2024, but time ran out before we were able to provide input during that session. We appreciate this opportunity to provide written comments.

Delta has significant concerns about CARB's proposal to regulate jet fuel under the LCFS Program. We believe the CARB proposal will raise the cost of jet fuel without increasing Sustainable Aviation Fuel (SAF) production or use in California. Furthermore, the proposal to regulate jet fuel is pre-empted by federal authority. Along with our trade association Airlines for America (A4A), we encourage CARB to withdraw the proposal to regulate jet fuel and instead establish a joint CARB-industry working group to explore alternative solutions to increase SAF production and use.

Delta Air Lines is committed to reducing its climate impact and achieving net zero carbon emissions by 2050, and transitioning to SAF is core to this commitment. We have long recognized that scaling up the supply of SAF and achieving net-zero carbon emissions by 2050 can only happen by working collaboratively with governments and other stakeholders across sectors. Achieving this ambition for SAF will require new and additional policy incentives, streamlined permitting processes, and close collaboration among governments, the aviation industry, the fuels industry, environmental organizations, and others.

Delta's Global Sustainability and Fuel teams have been working over the past several years to catalyze investment and stimulate SAF production by signing what's known as offtake agreements with various SAF producers. In these agreements, Delta commits to purchasing SAF from the producer when they have it, subject to certain conditions. To date, Delta has signed long-term offtake agreements for more than 200 million gallons of SAF to help us reach our goal of 10% SAF usage by the end of 2030. We are also entering into short-term offtake agreements to use the SAF that is available today. However, we know we cannot do this alone, and we are actively building coalitions across the SAF value chain to demonstrate the capacity for building and scaling SAF. We need government policies that build on those efforts, and not hinder the development.

California has established itself as an early leader in attracting investment, production, and use of SAF through the existing LCFS Program, which provides an opt-in credit for SAF that helps reduce the price difference between SAF and conventional jet fuel. Ensuring a healthy and vibrant aviation industry is essential to California's future, and leveraging CARB's early leadership on SAF can enable California leadership in the emerging SAF production industry, creating new jobs and economic development opportunities.

May 10, 2024

In its April workshop, CARB re-stated its objective to “increase the use of alternative jet fuel in the State.” We share that objective as reflected in our company commitments and our US airline industry support for the US government SAF Grand Challenge. Delta and our fellow airlines have clearly demonstrated a strong, enduring market signal for affordable SAF. The challenge remains the supply of affordable SAF, not the absence of a market signal by airlines.

171.1 cont. With this context, we express our serious concern with the proposal by CARB to regulate jet fuel used for flights within California as an obligated fuel under the LCFS Program. The proposal to eliminate the exemption for jet fuel used on intrastate flights would not result in significantly increased SAF production, availability, or use in California, but would lead to higher jet fuel prices and slow down, rather than accelerate, efforts to increase the state’s SAF production and use. The primary impediment to increased SAF production and availability in California remains the higher cost of SAF for producers and buyers relative to conventional jet fuel and renewable diesel. Whether or not jet fuel becomes a deficit generating fuel has no direct impact on whether SAF is produced or used. Because the proposal does not provide a mechanism to reduce the economic disadvantage of alternative jet fuel, it will have no material impact on the availability or use of alternative jet fuel in California.

In addition to not being an effective policy tool to increase SAF production, the proposal seeks to regulate jet fuel and reduce emissions from aviation, both of which are preempted under federal law, a fact that CARB recognized when it exempted jet fuel from the LCFS in 2018.¹ Aviation, unlike many other industries, is uniquely situated in that other factors such as the safe operation and maintenance of aircraft are of great importance, which the federal government has recognized in the jurisdiction of the FAA and the EPA’s Clean Air Act.

Our mutual interest is to increase SAF production, availability, and use, and the most effective way to accomplish this is to continue the positive, collaborative approach represented by the existing opt-in mechanism developed by CARB and the aviation community. Only actual SAF use – not merely the creation of jet fuel deficits – will provide the benefits of SAF desired by CARB, airport communities, SAF producers, and airlines. We urge CARB to reconsider and withdraw the proposal to remove the exemption for jet fuel for intrastate flights, preserve the existing opt-in approach for SAF, and establish a joint CARB-industry working group with stakeholders across the emerging SAF ecosystem to explore alternative policy and voluntary proposals to rapidly increase SAF production, availability and use in California. We look forward to working with CARB on such measures to accelerate SAF deployment.

Sincerely,



Margaret Claiborne Campbell
Assistant General Counsel, Delta Air Lines

¹ CARB stated that “[s]ubjecting aircraft fuels to annual carbon intensity standards would raise federal preemption issues” *available at* https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2018/lcfs18/isor.pdf?_ga=2.259407882.1202437490.1641231788-253234234.1573227006

May 10, 2024

Ms. Rajinder Sahota
Deputy Executive Officer, Climate Change and Research
California Air Resources Board
1001 I Street
Sacramento, CA 95864

Re: Comments on LCFS April 10, 2024, Workshop

Japan Hydrogen Forum (JH2F) is an organization formed in 2021 to contribute to the goal of decarbonization in the United States, consisting of 32 Japan-affiliated companies with hydrogen related technologies from production, carrier conversion, transportation, storage to utilization, including hydrogen fuel cell providers for heavy-duty (HD) truck and cargo handling equipment OEMs and retail hydrogen refueling station (HRS) providers in California.

JH2F is pleased to submit the following comments for consideration in response to the workshop held on April 10, 2024 (Workshop) on the Low Carbon Fuel Standard (LCFS). While acknowledging the continued improvements to the program, we would propose some critical refinements to ensure the success of hydrogen, and its necessary role in meeting California's 2045 carbon neutrality goal.

Increasing CI Targets and Market Stability

- 172.1 We support staff's recommendations to enact a higher Carbon Intensity (CI) step-down (at least 9% in 2025) and allow the Automatic Accelerator Mechanism (AAM) to trigger as early as possible (i.e., using 172.2 the 2025 data after step-down implementation), and at a lower trigger level.

We are concerned that the historically low credit prices will continue through 2025, which has a chilling effect on providers' financing further hydrogen refueling stations and is increasingly discouraging FCEV OEMs from committing capital to Hydrogen fuel cell light-duty (LD) and HD vehicles. Unlimited biodiesel and renewable diesel supply has been one of the leading causes of the LCFS credit market's inability to effectively support other pathways. We therefore urge starting with tighter targets and policies that can result in the immediate recovery of credit prices.

Infrastructure Crediting

LD HRI program

- 172.3 We believe the light-duty (LD) hydrogen refueling infrastructure (HRI) program was working well before credit prices precipitously dropped in 2023. We urge you to maintain the program at the current 1,200 kg/day capacity cap and 15-year crediting, with no geographic requirements. The proposed restrictions will surely limit the number of hydrogen stations deployed and is the exact opposite of what is needed for the fuel cell vehicle market.

HD HRI program

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We appreciate staff working with the hydrogen station developers to craft the program for heavy-duty (HD) HRI. However, we recommend allowing 15-year crediting and eliminating the geographic restrictions to attract the needed investment for stations.

80% Renewables by 2030

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We agree that renewable hydrogen production is the ultimate pathway for transportation, however, the imposition of an 80% renewable content requirement exclusively for HRI may be premature and overly restrictive, particularly in comparison to Fast-Charging Infrastructure (FCI). We suggest staff to maintain the 40% renewable requirement for hydrogen and conduct annual reviews to determine if increased renewable content is warranted.

We appreciate your consideration and thoughtful feedback to address our concerns. We look forward to contributing to California's goal of zero-emissions transportation.

Sincerely,



Takehito Yokoo
Chairperson,
Japan Hydrogen Forum

May 9, 2024

Liane Randolph
Chair, California Air Resources Board

Steven Cliff
Executive Officer, California Air Resources Board
1001 I Street
Sacramento, CA 95814

Comment submitted electronically

RE: Fulcrum Bioenergy's Comments on Sourcing Low Carbon Intensity Power for Sustainable Aviation Fuel Production Facilities and Federal Funding Issues

Dear Chair Randolph and Executive Officer Cliff:

This comment letter is submitted on behalf of Fulcrum BioEnergy, Inc. ("Fulcrum") regarding the critical regulatory issue of power sourcing for advanced low carbon fuel production facilities. We sincerely appreciate the time that California Air Resources Board ("CARB") staff and management has spent with us on this issue over the last several years. During this time, we have been exploring structures designed to maximize real-world carbon intensity ("CI") reductions while minimizing the risk of resource shuffling. On a parallel track, multiple agencies of the federal government have been exploring these same issues to establish guidelines and requirements under Inflation Reduction Act ("IRA") section 40B pertaining to sustainable aviation fuel ("SAF") and section 45V pertaining to hydrogen.

This comment letter provides Fulcrum's recommendations regarding the optimal Low Carbon Fuel Standard ("LCFS") policy structure to enable Fulcrum to build planned facilities in the San Francisco and Los Angeles metropolitan areas. The feedstock that Fulcrum utilizes to produce SAF is post-separated municipal solid waste ("MSW"). To convert this feedstock into high-quality SAF, Fulcrum utilizes gasification and other advanced processes that require significant energy inputs. Consistent with current LCFS regulatory requirements under section 95488.8(h), Fulcrum has persistently attempted at multiple planned facility locations to establish a direct connection behind the utility meter to a wind or solar facility. These requirements have proven impossible to meet at Fulcrum's current 10 MGY facility location near Reno, and similarly impossible at Fulcrum's 30 MGY facilities under development in the Chicago and Houston areas.

173.1 Due to this direct experience, Fulcrum is encouraged by the federal 40B SAF guidance that the SAF Interagency Working Group developed. The 40B structure relies heavily on CARB's existing LCFS book-and-claim structure for electricity used as a transportation fuel and for the

173.1
cont.

production of electrolytic hydrogen including hydrogen used to produce a transportation fuel. This existing LCFS regulatory structure coupled with the additionality guardrail imposed by DOE presents a superb opportunity for CARB to establish a similar and consistent policy structure available to SAF Producers like Fulcrum.

Fulcrum's Next Generation Biofuel Processing Technology

Fulcrum is the parent company of Fulcrum Sierra BioFuels, LLC ("Sierra BioFuels"). Sierra BioFuels owns and operates a commercial scale low carbon fuel production facility comprised of a Feedstock Processing Facility and a biorefinery. The Feedstock Processing Facility has been operational since 2017 and is located adjacent to the Lockwood Regional Landfill near Sparks, Nevada. The Feedstock Processing Facility is located on the truck route to Lockwood and receives diverted MSW that would otherwise be landfilled. A sophisticated feedstock processing system shreds, screens, and sorts the MSW producing an MSW-derived feedstock. The Sierra BioFuels biorefinery pictured below is fully constructed and is located approximately 20 miles east of Reno in the Tahoe-Reno Industrial Center. The biorefinery is now undergoing commissioning and expected to achieve full production in the late summer or early fall of 2024. The biorefinery will ultimately have the capability to convert the MSW-derived feedstock into very low carbon diesel fuel, jet fuel, and bio-crude using a three-step process comprised of steam reforming, Fischer-Tropsch ("FT") synthesis, and hydroprocessing. Initially, the biorefinery will produce bio-crude which will be co-processed at a conventional refinery into finished fuels.



Fulcrum is also in the development stage of two comparable facilities, including Fulcrum Centerpoint in Gary, Indiana and Fulcrum Trinity in Texas. Centerpoint will have triple the production capacity of the Sierra BioFuels Plant, with an estimated annual output of over 30 million gallons. Two Feedstock Processing Facilities will divert 750,000 annual tons of MSW from the Greater Chicago area to be converted into SAF at the biorefinery. This project is in development with operations targeted to start in 2027. Fulcrum plans to build an additional 12+ similar plants across the United States. Two of the planned facilities are to be located in California with the others located at other major cities in the U.S. Fulcrum also has international affiliates that are developing facilities outside the U.S. The following rendering depicts the planned 30 MGY Fulcrum plants with the large warehouses being utilized for the sorting of 2,000 tons of MSW per day per facility.



Why Carbon Intensity Matters to the Future of Fulcrum and Other Advanced Processing Technologies

As CARB is well-aware, a contentious topic in this rulemaking has been the amount of sustainable biomass feedstock that is available to displace petroleum and to enable California to meet its goals of carbon neutrality, 80% petroleum displacement, and 80% SAF market penetration by 2045. Post-separated MSW is an abundant and cheap feedstock that Fulcrum can secure in the vicinity of all major metropolitan areas. Diverting MSW reduces the expansion of landfills that occupy land, release methane emissions, and adversely impact soil, water and air. Through the conversion of post-separated MSW into SAF, Fulcrum is providing multiple environmental services.

The focus of the LCFS program structure is to reduce the CI of transportation fuels in California. Fulcrum's Sierra Biofuels facility has not yet been in steady-state operation for three months so does not have the necessary data to support a provisional pathway application. However, Fulcrum successfully secured a prospective fuel pathway in 2016, that was subsequently certified

with the modified version of CA-GREET 2.0 in September 2016 and that pathway remains listed on CARB's pathway chart.¹ Fulcrum's prior CI analysis is referenced here for illustrative purposes and to avoid the release of confidential business information. The Summary of the Re-Certification of Fulcrum's Fuel Pathway is attached as **Exhibit A**.

A review of Exhibit A reveals that the most important components of Fulcrum's CI score in terms of GHG emissions are the process emissions at 197.94, the tailpipe emissions at 70.97 and the electricity use at 36.72. The primary GHG benefit that Fulcrum's facilities will deliver is the avoidance of landfill methane emissions by keeping hundreds of thousands of tons of post-separated waste out of the landfill resulting in 303.77 gCO₂e/MJ in reductions. These major emission factors coupled with various minor factors resulted in a net prospective CI score for the Fulcrum facility of 14.78 gCO₂e/MJ. The electricity usage is based on the average CI of eGrid Subregion NWPP as determined by the U.S. Environmental Protection Agency ("EPA").²

With this context, it is possible to evaluate the importance of the electricity input to the facility from a carbon intensity standpoint. Like all of the subregions of the US transmission grid, significant fossil fuel resources persist on the Nevada grid which is part of the eGrid Subregion NWPP. Under the current LCFS regulation, there is no viable option for Fulcrum to choose to source zero carbon intensity power, even if Fulcrum is willing to pay a premium for that power and seeks to secure that zero-CI power consistent with Fulcrum's mission: *To produce renewable, drop-in aviation fuel at scale from an abundant and low-cost source that doesn't need to be grown or pulled from a well: household garbage.*³ By aligning SAF book-and-claim within the LCFS with the guidelines developed by the U.S. Department of Energy ("DOE") for section 40B, CARB would grant Fulcrum the ability to source zero carbon intensity power that would be recognized for LCFS CI pathway determination purposes thereby lowering Fulcrum's CI score by 36.72 points to -21.94 gCO₂e/MJ. This change would not just enable Fulcrum to better fulfill its environmental mission but also allow Fulcrum to provide a better return on investment to its investors which would unlock additional investments and facilities.

For the following calculations to determine the impact of zero-CI electricity on the value of LCFS credit generation, we will use Fulcrum's current CI score of 15 gCO₂e/MJ and compare that with a 40B/zero-CI electricity CI score of -22 gCO₂e/MJ. CARB's LCFS Dashboard provides a credit calculator that is an excellent tool for determining the value of LCFS credits based on user inputted values for compliance year, LCFS credit price, CI score, vehicle utilized, fuel displaced, and other factors.⁴ Fulcrum plans to focus solely on the SAF market so the following chart showing values determined by the CARB credit calculator is based on: the

¹ See CARB, "Certified Fuel Pathway Table" landing page at <https://ww2.arb.ca.gov/resources/documents/lcfs-pathway-certified-carbon-intensities>, Current Fuel Pathways available for download at https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/fuelpathways/current-pathways_all.xlsx

² U.S. Environmental Protection Agency, eGrid Maps, available at <https://www.epa.gov/egrid/maps>

³ See Fulcrum BioEnergy, Environmental Benefits: The Garbage-to-Clean Fuels Opportunity," at <https://www.fulcrum-bioenergy.com/environmental-benefits>

⁴ CARB, "LCFS Data Dashboard," Credit Value Calculator available for download via Figure 7 link, at <https://ww2.arb.ca.gov/resources/documents/lcfs-data-dashboard>

compliance year of 2025, the reference fuel of conventional jet fuel, a vehicle-fuel EER of 1, and fuel equivalency of: dollars per gallon of jet fuel. The LCFS credit prices used are low (\$50/MT), medium (\$150/MT), and high (\$250/MT) credit market scenarios. Utilizing these parameters yields the following credit values per gallon fuel, supplemental revenue for lower CI fuel, and increased revenues per year and over 15-year return on investment period.⁵

CI Score	\$50/MT	\$150/MT	\$250/MT
15	\$.45	\$1.36	\$2.26
-22	\$.69	\$2.06	\$3.43
Premium Value	\$.24/gallon	\$.70/gallon	\$1.17/gallon
Annual Premium Value @ 30 MGY	\$7,200,000	\$21,000,000	\$35,100,000
Premium Over 15 Year Return on Investment Period	\$108,000,000	\$315,000,000	\$526,500,000

Harmonization of California and Federal Policy
Will Maximize Federal Funding to California and Speed Decarbonization

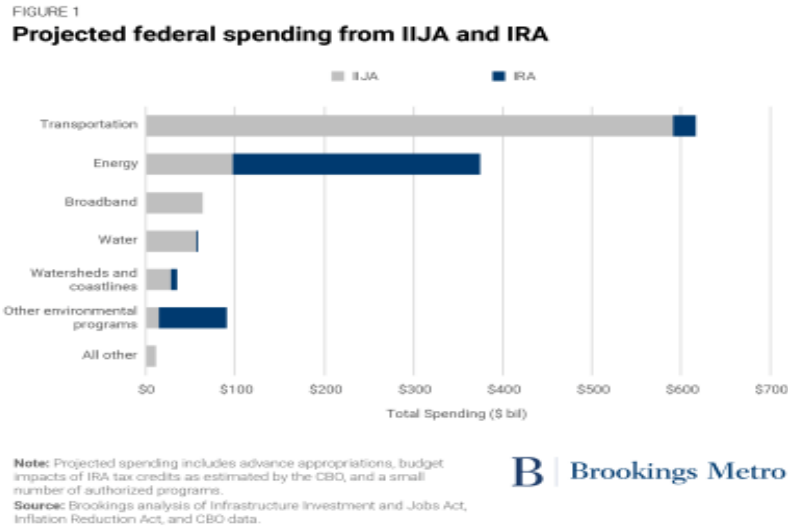
In this LCFS rulemaking, CARB can and should harmonize the life cycle analysis (“LCA”) methodology that underlies LCFS crediting for SAF with the federal LCA methodology for SAF. By establishing an LCA methodology within the LCFS regulation for SAF that is consistent the 40B LCA methodology, CARB will facilitate greater development of this vitally important fuel source for the hard to abate aviation sector. Through this regulatory strategy, CARB will also achieve upstream emission reductions and stimulate expansion of Low-CI power generation capacity, storage and transmission during the peak spending period of IRA and Infrastructure Investment and Jobs Act (“IIJA”).

As stated in a Brookings Institute Report issued on February 1, 2023:

Between the Infrastructure Investment and Jobs Act (IIJA) and the Inflation Reduction Act (IRA), the 117th Congress invested \$1.25 trillion across the transportation, energy, water resources, and broadband sectors for the next five to 10 years. It’s now the Biden administration’s responsibility to get that historic amount of money out the door—yet the bulk of it is still sitting in federal coffers or unrealized tax credits on the federal balance sheet. (...)

⁵ This calculation is not adjusted to reflect the compliance costs associated with sourcing Low-CI Power that is compliant with the LCFS book-and-claim program requirements as this information is not publicly available. Compliance does represent a significant cost that offsets a portion of the additional revenues.

After years of false starts and empty promises from Congress, the IRA is the first major federal spending response to climate change.(...) Using the same methodology as our Federal Infrastructure Hub, we can see the combined reach of the two bills.(...)⁶



173.3
cont.

As demonstrated in the prior analysis, the LCFS regulatory structure pertaining to Low-CI power sourcing has a material impact on the financial performance of a Fulcrum facility by altering the revenue stream that the LCFS programs provides to low carbon fuel production facilities that supply qualifying transportation fuels to California including SAF. While the total amount of revenue varies across the low, medium and high market scenarios, all three scenarios are highly significant in a commodity fuel market that trades fuel on basis points rather than pennies. An additional revenue stream of \$0.24 to \$1.17 per gallon of fuel produced can swing a marginal project to profitably thereby attracting debt and equity investment that would otherwise not participate. Fulcrum’s 30 MGY facilities are highly capital intensive requiring hundreds of millions of dollars to construct from start to finish. These facilities are long-term investments that typically will not provide a return on investment for at least a 15-year period. However, once the capital expenditure for the facility is recovered, the opportunity to make fuel from garbage is a highly attractive one. Over that 15-year period, the ability of a Fulcrum plant to source zero-CI power will deliver \$315 million in additional revenue in a medium LCFS market, over \$100 million in a low LCFS market, and over half a billion dollars in a high LCFS market. It is for this reason that low carbon fuel producers like Fulcrum are keen to access the Low-CI power market.

⁶ Adie Tomer, Caroline George and Joseph W. Kane for Brookings Research, “The start of America’s infrastructure decade: How macroeconomic factors may shape local strategies,” at <https://www.brookings.edu/articles/the-start-of-americas-infrastructure-decade-how-macroeconomic-factors-may-shape-local-strategies/>

Can an LCFS Regulatory Change Increase California's Access to Federal Funding?

As highlighted by the Brookings Institute Report, taken as a whole, the IIJA and IRA will deliver well over a trillion dollars to the U.S. economy over the period of a decade. It is a substantial undertaking for the federal government to establish the necessary programs, program structures, eligibility requirements, application process, and oversight for the programs. The IIJA was signed into law on November 15, 2021,⁷ and the IRA was signed into law on August 16, 2022.⁸ However, according to a comprehensive analysis released on May 8th by Politico, only a small slice of the funds have been spent. According to Politico:

- *Less than 17 percent of the \$1.1 trillion those laws provided for direct investments on climate, energy and infrastructure has been spent as of April, nearly two years after Biden signed the last of the statutes.*
- *Out of \$145 billion in direct spending on energy and climate programs in the Inflation Reduction Act, the biggest climate law in U.S. history, the administration has announced roughly \$60 billion in tentative funding decisions as of April 11. (...)*
- *And only \$125 billion has been spent from the \$884 billion provided by the infrastructure law and the pandemic law, both of which Biden signed in 2021. Roughly \$300 billion of that won't be legally available to spend until the next two fiscal years. (...)*
- *The IRA also unleashed a gusher of private company investments in clean energy and manufacturing by offering a series of tax breaks that, based on recent estimates, are worth at least \$525 billion.*

As noted by Politico, “Now time is running short for these efforts to show results before voters decide whether to bring back Trump, who has denounced the climate and infrastructure laws, mocked wind power and electric cars and inaccurately described the IRA as the “biggest tax hike in history.”⁹

⁷ U.S. Department of Transportation, “Bipartisan Infrastructure Law/Infrastructure Investment and Jobs Act,” at <https://www.phmsa.dot.gov/legislative-mandates/bipartisan-infrastructure-law-bil-infrastructure-investment-and-jobs-act-iiija>

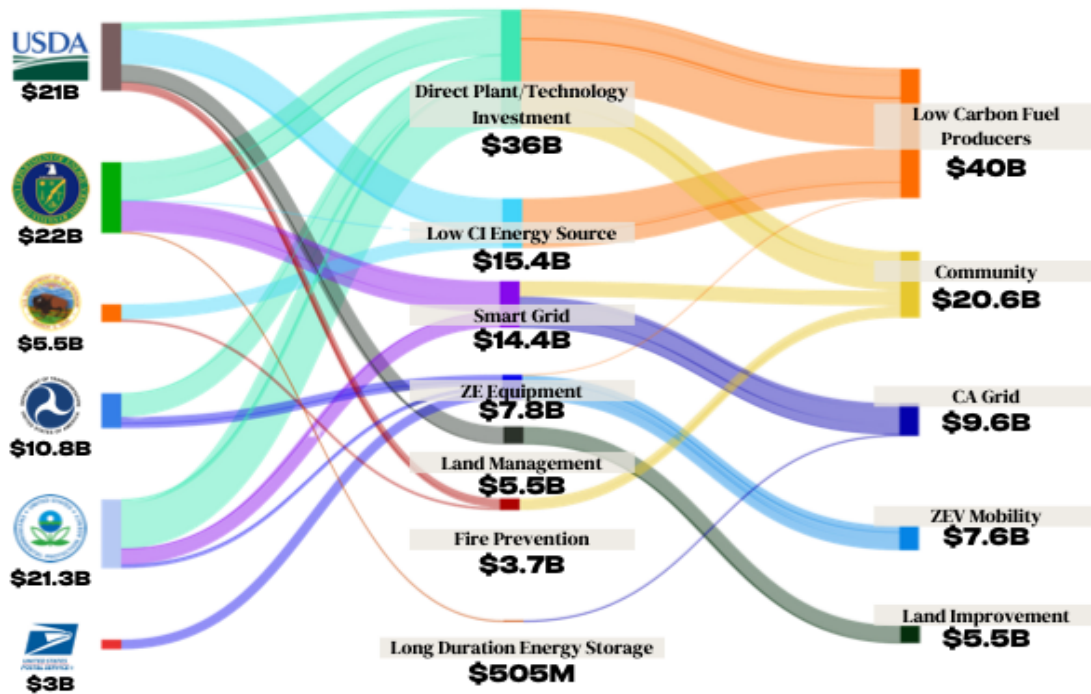
⁸ U.S. Department of the Treasury, “Inflation Reduction Act, at <https://home.treasury.gov/policy-issues/inflation-reduction-act#:~:text=On%20August%2016%2C%202022%2C%20President,made%20in%20the%20nation's%20history>.

⁹ POLITICO, “Biden’s big bet hits reality,” by Jessie Blaeser, Benjamin Storrow, Kelsey Tamborrino, Zack Colman and David Ferris, at <https://www.politico.com/interactives/2024/biden-trillion-dollar-spending-tracker/> (emphasis in original).

Establishing an LCFS Book-and-Claim System that is
Consistent with the 40B SAF Tax Credit will
Harmonize Policies, Increase SAF Project Viability and
Drive Federal Dollars To California

Based on the direct nexus between LCFS credit revenues and the economic viability of projects that low carbon fuel developers seek to finance and build, a group of low carbon fuel production companies has been funding a comprehensive analysis by Zero Emission Advisors and directed by NLC. This analysis has focused on the funding components contained in the IIJA and IRA that are most relevant to low carbon fuels and low carbon energy including funding designated for land restoration, feedstock development, wildfire risk management, energy generation, energy storage, large scale transmission, microgrids, waste and sanitation, advanced fuel technologies, hydrogen, SAF, hydrogen fuel cell and battery electric vehicles, alternative fuel and charging stations, and community assistance. This analysis has been anchored by the specific types of low carbon fuel facilities that currently supply or seek to supply low carbon transportation fuels to California under the LCFS including a wide range of liquid and gaseous low carbon fuel producers and developers. The overall universe of funding identified as relevant and available is \$83 billion depicted in the following diagram and categorized by 1) agency; 2) targeted sector (e.g., feedstock, energy, fuel, vehicle); and 3) targeted recipient.

FEDERAL FUNDING AVAILABLE



Fulcrum Specific Federal Funding Opportunities

Subsequent to the identification of all of the remaining relevant funding opportunities that have a sufficient nexus with the low carbon fuel sector, the focus of the IRA/IIJA project has been to identify the highest value potential sources of funding for specific companies given that company's feedstock, fuel, technology, and its possible ancillary benefits, e.g. Fulcrum's potential to divert MSW and reduce air, water and soil pollution. For Fulcrum, the following were the highest value identified programs.

Site Development \$8.25B:

The Environmental Protection Agency's Brownfields and Superfund programs provide essential funding for the cleanup and redevelopment of contaminated sites. Fulcrum recognizes the potential of these sites as ideal locations for its state-of-the-art biorefineries. By transforming these once-blighted areas into thriving centers of sustainable fuel production, Fulcrum not only addresses environmental challenges but also creates jobs and revitalizes communities.

Utility Development \$10.7B:

To support its biorefinery operations, Fulcrum requires reliable and sustainable utility infrastructure. The Powering Affordable Clean Energy (PACE) and Empowering Rural America (New ERA) programs provide the necessary funding to develop and upgrade electric distribution, transmission, and generation facilities in rural. Through collaboration with electric cooperatives and utility providers, Fulcrum can establish a robust and sustainable utility network that not only supports its own operations but also contributes to the broader transition to clean energy in rural areas.

Plant Development \$7.8B:

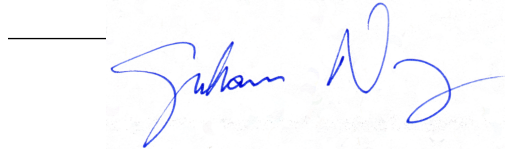
Fulcrum's success in transforming MSW into low-carbon biofuels relies on the development of advanced biorefinery facilities. The Biofuel Infrastructure and Agriculture Product Market Expansion program and the Advanced Industrial Facilities Deployment Program provide critical funding to scale up Fulcrum's production capabilities.

For details of these highlighted federal funding programs and other programs with strong potential to provide funding with a nexus to a Fulcrum biorefinery, please see **Exhibit B**.

Conclusion

Fulcrum appreciates the opportunity to provide this LCFS comment and to share the results of our analysis regarding federal funding opportunities that would be enhanced by the availability of book-and claim power sourcing for SAF. Our recommended revisions to the LCFS Regulation to effectuate this proposal are set forth in **Exhibit C**.

Sincerely,

A handwritten signature in blue ink, appearing to read "Graham Noyes", is written over a horizontal line.

Graham Noyes
Noyes Law Corporation

Exhibit A

SUMMARY OF THE RE-CERTIFICATION FUEL PATHWAY

T2R-1043	Pathway Description	Certified CI in GREET 1.8b modified version	New Certified CI (Modified version of GREET 2.0)	Note		
Applicant: Fulcrum Sierra BioFuels, LLC Location: Storey County, Nevada Certified Date: Carbon Intensity: FPC Code:	Fisher-Tropsch (FT) Diesel via Gasification and FT Synthesis of Municipal Solid Waste (MSW)	January 11, 2016 37.47 FTD001	September xx, 2016 14.78 TBD	Prospective Pathway		
User Inputs Parameters	Units	User inputs in 1.8b	in Modified GREET 2.0	CI Breakdown		
1) Feedstock processing from MSW						
MSW transport	AR Tons/Day	1550	1550			
HHD truck capacity for MSW	tons	24	24			
MSW transport	miles	-0.5	-0.5			
Baled feedstock transport by HHD truck	AR Tons/Day	776	776			
HHD truck capacity for baled feedstock	tons	40	40			
Baled feedstock transport	miles	15	15			
Diesel use in MSW processing	MJ/L FT Diesel	0.56	0.56			
2) FT Synthesis						
Electricity Mix for FT synthesis		US Average	4-NWPP			
FT Diesel yield	gal/dry ton	54.17	54.17			
Natural gas	MJ/L FT Diesel	25.76	25.76			
Electricity	kWh/L FT Diesel	2.91	2.91			
Flare gas	MJ/ MJ FT Diesel	0.029	0.029			
3) FT Diesel transportation and distribution						
FT Diesel transport to terminals (HHD Truck)	miles	240	240			
FT Diesel transport to retail stations (HHD Truck)	miles	50	50			

Exhibit B

Agency	Program	Program Description	Funding Amount
Department of Agriculture	Biofuel Infrastructure and Agriculture Product Market Expansion (Higher Blend Infrastructure Incentive Program)	To provide grants through the Higher Blend Infrastructure Incentive Program, which has the goal of significantly increasing the sales and use of higher blends of ethanol and biodiesel.	\$500,000,000
Department of Agriculture	Powering Affordable Clean Energy (PACE)	To provide partially forgivable loans to renewable-energy developers and electric service providers.	\$1,000,000,000
Department of Agriculture	Empowering Rural America (New ERA)	To fund the construction of electric distribution, transmission, and generation facilities for rural electric cooperatives	\$9,700,000,000
Department of Energy	Advanced Industrial Facilities Deployment Program	To provide competitive financial support to owners and operators of facilities engaged in energy intensive industrial processes to complete demonstration and deployment projects that reduce a facility's greenhouse gas emissions.	\$5,812,000,000
Department of Energy	Clean Hydrogen Manufacturing Recycling Research, Development, and Demonstration Program	To provide Federal financial assistance to advance new clean hydrogen production, processing, delivery, storage, and use equipment manufacturing technologies and techniques.	\$500,000,000

Agency	Program	Program Description	Funding Amount
Department of Energy	Clean Hydrogen Electrolysis Program	To establish a research, development, demonstration, and deployment program for purposes of commercialization to improve the efficiency, increase the durability, and reduce the cost of producing clean hydrogen using electrolyzers.	\$1,000,000,000
Department of Energy	Long-Duration Energy Storage Demonstration Initiative and Joint Program	To establish a demonstration initiative composed of demonstration projects focused on the development of long-duration energy storage technologies.	\$150,000,000
Department of Energy	Energy Storage Demonstration and Pilot Grant Program	To enter into agreements to carry out 3 energy storage system demonstration projects.	\$355,000,000
Department of the Interior	Water Recycling	Projects that reclaim and/or reuse municipal, industrial, and agricultural wastewater; or impaired ground and surface waters. Large Scale Water Recycling Program is defined in the Bipartisan Infrastructure Law as projects that reclaim and reuse municipal, industrial, domestic, or agricultural wastewater; or impaired groundwater or surface water with a total project cost of \$500 million or more and located in a Reclamation State.	\$1,000,000,000

Agency	Program	Program Description	Funding Amount
Department of Transportation	Fueling Aviation's Sustainable Transition through Sustainable Aviation Fuels (FAST-SAF)	To provide grant funding for eligible entities to carry out projects relating to the production, transportation, blending, or storage of sustainable aviation fuel (SAF	\$244,530,000
Environmental Protection Agency	Climate Pollution Reduction Grants: Implementation Grants	To provide grants to Tribes, states, air pollution control agencies, and local governments to develop and implement plans for reducing greenhouse gas emissions.	\$4,750,000,000
Environmental Protection Agency	Superfund	The Environmental Protection Agency's Superfund program is responsible for cleaning up some of the nation's most contaminated land.	\$3,500,000,000
Environmental Protection Agency	Brownfields Projects	The Environmental Protection Agency's Brownfields Program provides funds to empower States, communities, Tribes, and nonprofit organizations to prevent, inventory, assess, clean up, and reuse brownfield sites.	\$1,200,000,000

Exhibit C

Recommended new regulatory language is underlined.

Section 95488.8 (existing LCFS regulation)

(i) Indirect Accounting for Renewable or Low-CI Electricity and Biomethane.

(1) *Book-and-Claim Accounting for Renewable or Low-CI Electricity Supplied as a Transportation Fuel or Used to Produce Hydrogen.(...)*

(...)

(2) *Book-and-Claim Accounting for Pipeline-Injected Biomethane Used as a Transportation Fuel or to Produce Hydrogen. (...)*

(...)

Add:

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(3) Book-and-Claim Accounting for Renewable or Low-CI Electricity Used to make Alternative Jet Fuel. Reporting entities may use indirect accounting mechanisms for low-CI electricity supplied for Alternative Jet Fuel production, provided the conditions set forth below are met:

(A) Reporting entities may report low-CI electricity supplied for Alternative Jet Fuel production delivered through the grid without regard to physical traceability if it meets all requirements of this subarticle. The low-CI electricity must be supplied to the grid within a California Balancing Authority (or local balancing authority for Alternative Jet Fuel produced outside of California) or alternatively, meet the requirements of California Public Utilities Code section 399.16, subdivision (b)(1). Such book-and-claim accounting for low-CI electricity may span only three quarters. The low CI electricity source must have a commercial operation date that is no earlier than thirty-six months before the Alternative Jet Fuel production facility begins commissioning. If a low-CI electricity quantity (and all associated environmental attributes, including a beneficial CI) is supplied to the grid in the first calendar quarter, the quantity claimed for LCFS reporting must be matched to grid electricity for alternative jet fuel production no later than the end of the third calendar quarter. After that period is over, any unmatched low-CI electricity quantities expire for the purpose of LCFS reporting;

(B) All electricity procured by any LSE for the purpose of claiming a lower CI must be in addition to that required for compliance with the California Renewables Portfolio Standard (described in California Public Utilities Code sections 399.11-399.32) or, for Alternative Jet Fuel produced outside of California, in addition to local renewable portfolio requirements;

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- (C) Renewable energy certificates or other environmental attributes associated with the electricity, if any, are retired and not claimed under any other program with the exception of the federal RFS, and the market-based compliance mechanism set forth in title 17, California Code of Regulations Chapter 1, Subchapter 10, article 5 (commencing with section 95800).



May 9, 2024

Matthew Botill
Division Chief, Industrial Strategies Division
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Recommendation to Establish a Safe Harbor LCFS Crediting Period to Incentivize Early Adoption of Enhanced Landfill Methane Collection Systems

(Comment submitted electronically)

Dear Mr. Botill,

On behalf of Loci Controls, Inc. (“Loci”), I am writing to provide comments relating to the Proposed Amendments to the Low Carbon Fuel Standard (“LCFS”). Specifically, this comment recommends that the California Air Resources Board (“CARB”) establish a safe harbor crediting period for early adopters of enhanced landfill methane collection systems including automated monitoring and control technologies for landfills (“Advanced LFG Control Systems”). The establishment of this crediting period would be consistent with the language and intent of SB 1383, the short-lived climate pollutant (“SLCP”) statute that underpins the SLCP Strategy that CARB developed. Under the LCFS program at section 95488.9(f)(4), similar safe harbor crediting periods already exist for dairy and swine digester pathways and for voluntary organics diversion pathways. The establishment of this safe harbor for enhanced landfill methane collection systems would incentivize landfill owners and operators to install these systems prior to the effective date of any future more stringent landfill methane regulation.

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If implemented, this proposal would expedite and expand the capture of methane, the largest component of landfill gas by volume, and reduce methane emissions. The accelerated and expanded capture of methane would be highly beneficial to California’s greenhouse gas (“GHG”) and carbon neutrality goals given that methane is a potent short-lived climate pollutant. As stated in the 2022 Final Scoping Plan,

Human sources of methane emissions are estimated to be responsible for up to 25 percent of current warming. Fortunately, methane’s short atmospheric lifetime of ~12 years means that emissions reductions will rapidly reduce concentrations in the atmosphere, slowing the pace of temperature rise in this decade. Further, a substantial portion of the targeted reductions can be achieved at low cost and will provide significant human health benefits. For example, the UN’s Global Methane Assessment (2021) found that over half of the available targeted measures have mitigation costs below \$21/MTCO₂e,

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and that each million metric tons of methane reduced would prevent 1,430 premature deaths annually due to ozone pollution caused by methane.¹

Loci' Technology

Loci is a world leader in the development and deployment of Advanced LFG Control Systems. Loci's patented cloud-connected real time data and automated gas collection control platform is comprised of four components: the Controller, the Sentry, WellWatcher® control dashboard, and Liquid Level Management. Loci's Advanced LFG Control System provides landfill gas collection system operators with data to improve operations, increase methane capture, and reduce landfill gas emissions. In 2021, the American Carbon Registry ("ACR") affirmed the environmental value of Loci's Advanced LFG System with the approval of a methodology which enables landfills to go beyond existing regulations to prevent the release of methane and other gases into the atmosphere, thereby offering the potential for hundreds of millions of tons of additional emission reductions over the next decade.² Because Loci's technology goes beyond current regulatory requirements, its deployment offers additional, real-world, measureable reductions of LFG emissions.

Opportunities to Decrease Landfill Gas Methane Emissions

As stated in the Final 2022 Scoping Plan:

"Due to the multidecadal time frame required to break down landfilled organic material, the emissions reductions from diverting organic material in one year are realized over the course of several decades. For example, one year of waste diversion in 2030 is expected to avoid 8 MMTCO₂e of landfill emissions, cumulatively, over the lifetime of that waste's decomposition. Near-term diversion efforts are critical to avoid locking in future landfill methane emissions. (...)

While reducing organic waste disposal is the most effective means of achieving reductions in waste sector methane, strategies to reduce emissions from waste already in place in landfills also will play a role in achieving near-term reductions. As Figure 4-16 shows, the total degradable carbon (a measure of the amount of waste with potential to generate methane) that is accumulated from waste deposited in previous years is over 20 times greater than the amount added each year. This illustrates that even if we were able to entirely phase out landfilling of organic waste today, the existing waste in place at landfills would continue to generate methane for decades into the future.

¹ CARB, Final 2022 Scoping Plan (December 2022), at p. 225 (footnotes omitted), at <https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf>

² "Methodology for the Quantification Monitoring, Reporting and Verification of Greenhouse Gas Emissions Reductions and Removals from Landfill Gas Destruction and Beneficial Use Projects, version 2.0," available at https://americancarbonregistry.org/carbon-accounting/standards-methodologies/landfill-gas-destruction-and-beneficial-use-projects/lfg-methodology-v2-f_2021-05-05.pdf, press release with quote at <https://americancarbonregistry.org/news-events/program-announcements/acr-approves-new-methodology-to-reduce-methane-emissions-from-large-landfills>

Through a combination of improvements in operational practices, use of lower permeability covers, advanced landfill gas collection systems, and increased monitoring to detect and repair leaks, it is estimated that a direct emission reduction of 10 percent is achievable across the state's landfills by 2030. Technologies to utilize landfill gas efficiently can contribute further emission reductions in the energy sector.³

Landfill Gas Reduction Potential in California

174.1 cont. The largest landfills in California have been reporting gas collection operating performance annually for twenty years or more pursuant to measurement requirements and methodologies established by EPA Greenhouse Gas Reporting Program. This public data base provides a reliable benchmark for gas collection operations using industry standard manual wellfield tuning. An independent peer review of four landfills which utilized Loci's Advanced LFG Control System found an increase in methane capture of 13-24% compared to the landfill's previously documented LFG capture performance. Utilizing a representative estimate of average performance improvement of 15% for implementation of Loci's Advanced LFG System would result in the following decreases in methane emissions from California landfills.

Year	% of California Landfill AGCCS Adoption (methane inventory basis)	Emissions Reduction Annually from Landfills with AGCCS - in metric tons/year CO ₂ e	% reduction of Estimated CA Landfill Emissions relative to 2019 estimated baseline
2024	3%	163,400	2%
2025	6%	245,100	3%
2026	9%	408,500	5%
2027	12%	571,900	7%
2028	15%	653,600	8%
2029	18%	817,000	10%
2030	21%	898,700	11%
2031	25%	1,143,800	14%
2032	30%	1,307,200	16%
2033	35%	1,552,300	19%
2034	40%	1,797,400	22%
2035	45%	2,042,500	25%

Status of Future California Landfill Methane Regulations

Approximately one year ago, on May 18, 2023, CARB held an informal workshop entitled Public Workshop on Potential Improvements to the Landfill Methane Regulation with stakeholders to inform the development of future landfill methane regulations.⁴ Since that time, there has not been another LMR workshop held or scheduled. It is anticipated that at some point in the future CARB may hold additional workshops and will subsequently proceed to develop the

³ California Air Resources Board, "2022 Scoping Plan for Achieving Carbon Neutrality," (November 16, 2022), from Landfill Methane section at p. 233-234 (emphasis supplied, footnotes omitted), available at <https://ww2.arb.ca.gov/sites/default/files/2022-11/2022-sp.pdf>

⁴ CARB, "Landfill Methane Regulation Meetings & Workshops," at <https://ww2.arb.ca.gov/our-work/programs/landfill-methane-regulation/meetings>

174.1 cont. proposed regulations, and to prepare the necessary analyses that are necessary to support the review and approval of any future landfill methane regulations. At this time, it is uncertain when the public workshop process will complete, when the formal rulemaking process will begin, and when the future LMR will come into effect. As established by SB 1383, Health and Safety Code section 39730.6(b) provides that except as otherwise provided by this section and Public Resources Code section 42652.5, CARB “shall not adopt, prior to January 1, 2025, requirements to control methane emissions associated with the disposal of organic waste in landfills other than through landfill methane emissions control regulations.” SB 1383 does not establish a date by which CARB must adopt more stringent LFG regulations. During this period of regulatory uncertainty, most landfill operators can reasonably be expected to defer investments in enhanced landfill methane collection systems until the program specifics are conclusively determined by CARB and approved by the Governing Board.

A Simple LCFS Program Amendment Will Speed Deployment of
Enhanced Landfill Methane Collection Systems

174.1 cont. In the interim period before more stringent regulations are established, the LCFS program does provide a market signal to incentivize the deployment of enhanced landfill methane collection systems even before the landfill methane regulations are proposed to the Governing Board, and likely years before future regulatory mandates will require large-scale deployment of Advanced LFG Control Systems. Unfortunately, due to the nature of LCFS program crediting, the possibility of future mandated installation of Advanced LFG Control Systems is likely to undercut that LCFS market signal. Specifically, the LCFS program structure provides incentives for reductions to the carbon intensity (“CI”) of transportation fuels based on a California regulatory baseline. In other words, while the use of RNG or electricity derived from non-mandatory methane capture would provide a recognizable CI reduction under the LCFS, the capture and use of the same RNG or electricity from mandated methane capture would not. Thus a landfill owner or operator that installs an enhanced landfill methane collection system in the near-term faces uncertainty regarding two critical investment decisions: 1) whether the Advanced LFG Control System or other system will meet the future LMR requirements that CARB has not yet established and 2) uncertainty regarding for how many years an early adopter facility will generate LCFS credits.

This hurdle could be overcome by the establishment of a safe-harbor LCFS crediting provisions for Enhanced Landfill Methane Collection Systems. This approach is consistent with the existing language of SB 1383 for the dairy and swine manure pathways and for qualified organics diversion. For these types of pathways, LCFS crediting is protected for a 10-year period by §95488.9(f)(3) even if CARB approves mandated methane control in the dairy sector or diversion of organic material from landfill disposal.⁵ To the extent that CARB seeks to extend comparable treatment for landfill gas, §95488.9(f) of the LCFS could be amended to establish a 10-year crediting period for projects that capture biomethane that would otherwise be released to

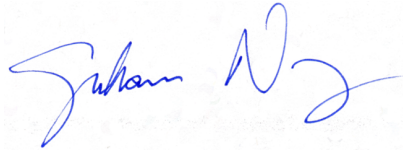
⁵ See LCFS Regulation entitled “Special Circumstances for Fuel Pathway Applications at §95488.9(f)(3) that provides for 10-year crediting periods for avoided methane emissions for dairy and swine manure pathways and for landfill-diversion pathways.

174.1 cont. the atmosphere from the landfill and that commence prior to the establishment of any law, regulation, or legally binding mandate. Proposed regulatory changes to implement this proposal are included in attached Exhibit A.

Conclusion

We would welcome the opportunity to provide any further information that would be value to CARB on this subject.

Respectfully,



Graham Noyes
Representing Loci Controls, Inc.

Exhibit A

Section 95488.9(f) as proposed in rulemaking, proposed new language in black underline, proposed new Loci language in red underline/~~strike-out~~:

(f) *Carbon Intensities that Reflect Avoided Methane Emissions from Dairy and Swine Manure, ~~or Organic Waste Diverted from Landfill Disposal~~, or Enhanced Landfill Methane Collection Systems.*

- (1) A fuel pathway that utilizes biomethane from dairy cattle or swine manure digestion may be certified with a CI that reflects the reduction of greenhouse gas emissions achieved by the voluntary capture of methane, provided that:
 - (A) A biogas control system, or digester, is used to capture biomethane from manure management on dairy cattle and swine farms that would otherwise be vented to the atmosphere as a result of livestock operations from those farms.
 - (B) The baseline quantity of avoided methane reflected in the CI calculation is additional to any legal requirement for the capture and destruction of biomethane.
- (2) A fuel pathway that utilizes an organic material may be certified with a CI that reflects the reduction of greenhouse gas emissions achieved by the voluntary diversion from decomposition in a landfill and the associated fugitive methane emissions, provided that:
 - (A) The organic material that is used as a feedstock would otherwise have been disposed of by landfilling, and the diversion is additional to any legal requirement for the diversion of organics from landfill disposal.
 - (B) Any degradable carbon that is not converted to fuel is subsequently treated in an aerobic system or otherwise is prevented from release as fugitive methane. Upon request, the applicant must demonstrate that emissions are not significant beyond the system boundary of the fuel pathway.
 - (C) The baseline quantity of avoided methane reflected in the CI calculation is additional to any legal requirement for the avoidance or capture and destruction of biomethane.
- (3) A fuel pathway that utilizes enhanced landfill methane collection systems may be certified with a CI that reflects the reduction of greenhouse gas emissions achieved by the voluntary capture of methane provided that:
 - (A) The enhanced landfill methane collection system is additional to any legal requirement for the capture of methane from landfills.
 - (B) Any degradable carbon that is not converted to fuel is prevented from release as fugitive methane. Upon request, the applicant must demonstrate that emissions are not significant beyond the system boundary of the fuel pathway.

(C) The baseline quantity of avoided methane reflected in the CI calculation is additional to any legal requirement for the avoidance or capture and destruction of biomethane.

(4) Carbon intensities that reflect avoided methane emissions from dairy and swine manure or organic waste projects are subject to the following requirements for credit generation:

(A) *Crediting Periods.* Avoided methane crediting for dairy and swine manure pathways as described in (f)(1) above, for landfill- diversion pathways as described in (f)(2) above, and for enhanced landfill methane collection as described in (f)(3) above is limited to three consecutive 10 years crediting periods, counting from the quarter following Executive Officer approval of the application. The pathway holder must formally request each subsequent crediting period for the project through the LRT-CBTS. The Executive Officer may renew crediting periods for fuel pathways certified before January 1, 2030, for up to three consecutive 10-year crediting periods. For pathways for bio-CNG, bio-LNG, and bio-L-CNG used in CNG vehicles associated with projects that break ground after December 31, 2029, the Executive Officer may only approve avoided methane crediting through December 31, 2040. For pathways for biomethane used to produce hydrogen that break ground after December 31, 2029, the Executive Officer may only approve avoided methane crediting through December 31, 2045.

(B) Notwithstanding (A) above, in the event that any law, regulation, or legally binding mandate requiring either greenhouse gas emission reductions from manure methane emissions from livestock and dairy projects, ~~or~~ diversion of organic material from landfill disposal, or enhanced landfill methane collection comes into effect in California during a project's crediting period, then the project is only eligible to continue to receive LCFS credits for those greenhouse gas emission reductions for the remainder of the project's current crediting period. The project may not request any subsequent crediting periods.

(C) Notwithstanding (A) above, projects that have generated CARB Compliance Offset Credits under the market-based compliance mechanism set forth in title 17, California Code of Regulations Chapter 1, Subchapter 10, article 5 (commencing with section 95800) may apply to receive credits under the LCFS. However, the LCFS crediting period for such projects is aligned with the crediting period for Compliance Offset Credits, and does not reset when the project is certified under the LCFS.

May 10, 2024

The Honorable Liane M. Randolph
Chair
California Air Resources Board
(Comment submitted electronically)

RE: Infinium Operations, LLC's Recommendations to Enable California to Harness the Profound Decarbonization Potential of eFuels

Dear Chair Randolph,

175.1 Infinium Operations, LLC ("Infinium") is pleased to submit supplemental comments regarding the California Air Resources Board's ("CARB") proposed amendments to the Low Carbon Fuel Standard ("LCFS"). During the 45-day comment period, Infinium respectfully requested that CARB revisit its proposed regulation (the "Proposed Regulation") pertaining to the sourcing of low carbon intensity power ("Low-CI Power") as applied to power-to-liquid fuels ("PtL Fuels") which are also known as "eFuels." Since the filing of our prior comment, new federal policy regarding Low-CI Power has changed the policy landscape favorably for eFuels. We are therefore updating our comments regarding the optimal LCFS regulatory structure to complement this federal policy. This comment highlights the benefits of aligning the LCFS with section 40B of the Inflation Reduction Act ("IRA") to standardize Low-CI Power sourcing rules, improve economics for eFuels and enable full commercialization of this vital fuel technology.

Our 45-day comment discussed the critical importance of eFuels to decarbonizing hard to abate sectors including legacy gasoline vehicles, and long-haul aviation. We appreciate that many other stakeholders emphasized the special role of eFuels and that CARB recognizes the vital importance of eFuels. We therefore only briefly revisit this topic with additional support and reference our 45-day comment letter for its analysis and authority.¹

Our prior comment also respectfully requested that CARB enhance the LCFS program by:

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1. Establishing a book-and-claim accounting system for hydrogen pipelines that is applicable outside California.
 2. Establishing a book-and-claim accounting system for carbon dioxide pipelines that is applicable outside California.
 3. Revising the proposed Alternative Fuel definition to account for drop-in eFuel alternatives for gasoline and diesel fuel.

We would like to reiterate the importance of these issues but do not think it necessary to update or restate any of these issues through this Comment. We therefore simply encourage review of our 45-day comment letter on these issues.²

¹ See "Proposed Low Carbon Fuel Standard Amendments, Public Comments Received," Comment #353, Comment of Infinium RE: Electrofuels, at www.arb.ca.gov/lists/com-attach/7032-lcfs2024-VD1TO1UyUW5Hb1Q9.pdf at p. 2-5 (hereafter "Infinium 45-day Comment").

² *Id.* at p. 7-8.

The Critical Issue for eFuels is Access to Low Carbon Intensity Power

As further examined in this comment, the critical issue we raise is that the Proposed Regulation precludes the recognition of greenhouse gas (“GHG”) emission reductions that are achieved by sourcing Low-CI Power delivered over the grid to produce eFuels. By effectively limiting eFuel production facilities to sourcing grid power that includes fossil-based power, the Proposed Regulation precipitously increases the CI of eFuels. Because eFuels effectively convert electricity into drop-in liquid fuels, blocked access to Low-CI Power prevents LCFS credit generation. Exclusion from LCFS revenue opportunities freezes rather than catalyzes the growth of the eFuel industry and the expansion of new sources of renewable power.

The core objective of the LCFS program is the decarbonization of transportation fuels in California. LCFS credit generation opportunities are based on CI reductions achieved as compared to annual CI benchmark standards for diesel, gasoline and fossil jet fuel. Utilizing conventional gasoline as the reference fuel, Table 1 of the current LCFS regulation establishes a CI benchmark standard of 85.77 gCO₂e/MJ for 2025. In order to generate LCFS credits, fuels used as a substitute for gasoline must be certified with a CI score of less than 85.77 gCO₂e/MJ. Market participants that supply gasoline fuel into the California transportation market with a CI score in excess of 85.77 gCO₂e/MJ in 2025 generate deficits that trigger a corresponding obligation to purchase and retire LCFS credits on annual basis.

In the 45-day rulemaking package, CARB proposed to retain the existing LCFS structure for Low-CI power for electric vehicle usage as currently exists in section 95488.8(i)(1)(A)-(B). CARB proposed, however, to restrict the use of book-and-claim accounting for hydrogen to hydrogen used directly as a transportation fuel and to exclude eligibility to hydrogen used to produce a transportation fuel as reflected in proposed section 95488.8(i)(1). This proposed elimination of book-and-claim accounting for hydrogen used to produce a transportation fuel is uniquely damaging to eFuels producers. It is through the production of electrolytic hydrogen that eFuel producers convert electric energy into molecular energy that after further processing and synthesis is converted into drop-in liquid fuels that replace fossil gasoline, diesel and jet fuel. Upon the effective date of an LCFS regulation that effectively provides that electrolytic hydrogen can only be produced from grid mix electricity, eFuel producers are transformed from LCFS credit generators to LCFS deficit generators.

The following estimated CI values for eFuels were determined by internal life cycle analysis (LCA) undertaken by Infinium personnel based on non-proprietary information on eFuels. The CI estimates were made on a wells-to-wheels basis with input values from the upcoming CA-GREET4.0 model. Using these parameters, the forecasted CI score of sustainable aviation eFuel (“eSAF”) produced at an eFuel facility sited in California and utilizing California average grid mix power would exceed 180 gCO₂e/MJ. To the extent that the same eFuel facility could instead utilize book-and-claim accounting to source zero CI power under the current LCFS regulatory structure established by section 95488.8(i)(1)(A)-(B) for both its electrolytic hydrogen production and for all of its electricity use, the eSAF produced at the eFuel facility would achieve a CI score of less than 3 gCO₂e/MJ.

Thus, it is not hyperbolic to assert that the Proposed Regulation represents an existential threat to the establishment of eFuel production facilities that would serve the California market. Pursuant to Table 3 of the existing regulation, “LCFS Carbon Intensity Benchmarks for 2019 for Fuels Used as a Substitute for Conventional Jet Fuel,” an eFuel production facility providing eSAF to the California market would be delivering a fuel that exceeds the 2025 benchmark standard by over 93 gCO₂e/MJ. In contrast, an eFuel production facility that is authorized by the LCFS regulation to source all of its power via a book-

and-claim accounting system that is comparable to the current system for electrolytic hydrogen production would be supplying an eSAF to be uplifted in California with a CI score of 3, a lower CI score than currently exists for any alternative jet fuel in the pathways table.

Infinium

Infinium’s mission is to decarbonize the transportation sector through the production of eFuels, an ultra-low carbon fuel alternative to petroleum derived transportation fuels. Infinium eFuels are drop-in replacements for use in planes, ships and motor vehicles without the need for costly infrastructure changes. Infinium’s proprietary technology utilizes carbon dioxide (CO₂) that would otherwise be emitted, renewable power, and water as feedstocks to produce transportation fuels (e.g. eSAF, eDiesel and eNaphtha), with substantial reductions in lifecycle GHG carbon emissions as compared to fossil-based alternatives. Infinium is financially and strategically supported by its investors, including affiliates of Amazon, NextEra Energy, Mitsubishi Heavy Industries, SK Ventures, and AP Ventures. These world leading companies are interested in both reducing their carbon footprints and innovating solutions to current environmental issues. Infinium operates the first commercial drop-in eFuel facility in the world at its plant in Corpus Christi, Texas. Infinium announced a second commercial eFuel facility in West Texas call Project Roadrunner, which will focus primarily on the production of eSAF to decarbonize air traffic.

Low-CI Power Sourcing is Essential to the Success of eFuels And eFuels are Essential to Successful Decarbonization

This past November, The International Council on Clean Transportation (“ICCT”) published a white paper assessing the feasibility of meeting the targets in the Biden Administration’s SAF Grand Challenge based on “resource availability, production costs, technology readiness level, and policy support.”³ ICCT’s white paper emphasized the importance of eSAF in meeting the 2050 SAF Grand Challenge goal of 35 billion gallons and stated as follows:

Though the technology remains in the demonstration phase, e-fuels have gained significant interest in Europe and other markets due to their ‘drop-in’ advantages and theoretically unlimited supply.(...) These e-fuels are estimated to be costlier than most biomass-derived SAFs in the near-future, but their costs could rapidly come down as electrolyzer technology matures and the cost of renewable electricity declines (Zhou et al., 2022).⁴

Consistent with ICCT’s recognition of the importance of eFuels in the above-referenced white paper entitled Meeting the SAF Grand Challenge, ICCT’s 45-day comment letter to the LCFS rulemaking contained the following comment and recommendation regarding eFuels:

However, we note that as written, the current guidance will restrict the use of e-fuels made from low-CI electricity, as these are not included in the current language. Thus the proposal would effectively restrict low-CI electricity from being eligible for attribution unless it was supplied via a direct electricity connection. However, it is likely that as with most green hydrogen production, grid-connected projects will have greater economic competitiveness due to a higher capacity

³ O’Malley, J., Pavlenko, N., & Kim, Y.H. (2023). Meeting the SAF Grand Challenge: Current and Future Measures to Increase U.S. Sustainable Aviation Fuel Production Capacity. International Council on Clean Transportation. Available at <https://theicct.org/wp-content/uploads/2023/11/ID-37-%E2%80%933-SAF-Grand-Challenge-white-paper-letter-40036-v3.pdf>.

⁴ Id.

factor.⁵ Therefore, to provide more flexibility for e-fuel pathways based on converting green hydrogen into other fuels, we recommend that CARB treat these pathways' use of low-CI electricity consistent with green hydrogen and direct air capture. This will still maintain crucial safeguards on project vintage, deliverability and double-counting, while providing necessary flexibility for these projects to use renewable electricity supplied via the grid.⁶

As noted by ICCT, eFuels are costlier than most biomass derived SAF currently and in the near future. However, there is an opportunity to reduce the cost of eFuels as electrolyzer technology matures and the cost of renewable electricity further declines. Success in driving down the cost of both wind and solar power has been an enormous success story that has been led in the US by California policy and optimal LCFS policy design can unlock these Low-CI power sources for hydrogen, SAF and eFuels. This aligns with California's 2022 Scoping Plan's ambitious goals to expand supply and demand for hydrogen while driving down prices. The LCFS is CARB's most powerful and proven tool to introduce and scale these types of Low-CI fuel technologies.

**New Federal Policy Unlocking Low-CI Power for SAF Producers
Through Existing LCFS Regulatory Mechanisms
Should be Integrated into the LCFS for Both SAF and eFuels**

The new federal policy referenced earlier in this Comment is focused not solely on eFuels used in the aviation sector but more broadly on all types of SAF that meets the federal CI standard established by section 40B. Infinium plans to primarily produce SAF at its production facilities but also plans to produce other fuels and feedstocks such as eDiesel as an on-road fuel that meets conventional diesel specifications and eNaphtha that can be utilized as a blendstock to produce gasoline that meets conventional gasoline specifications. Because Infinium intends to produce both SAF and Low CI on-road fuels and due to the uniquely beneficial attributes of eFuels discussed previously in this letter and in our 45-day comment letter, Infinium recommends that CARB authorize indirect accounting for SAF and all eFuels. In addition, because eFuels are drop-in fuels that comply with conventional petroleum-based ASTM specifications, Infinium recommends that CARB adopt an LCFS definition of eFuels to precisely distinguish eFuels from fossil fuels for LCFS regulatory purposes.

The following overview of the newly-established federal Low-CI power sourcing structure for SAF is provided to serve as the policy basis for CARB to implement a similar LCFS regulatory structure applicable not just to SAF but also to hydrogen, direct air capture and eFuels. Under section 40B of the 2022 Inflation Reduction Act ("IRA"), a federal tax credit of \$1.25-\$1.75 per gallon was established for sustainable aviation fuel that attained a carbon intensity reduction of at least 50% (the "SAF Tax Credit") as determined by either: "(1) the most recent Carbon Offsetting and Reduction Scheme for International Aviation ("CORSIA") which has been adopted by the International Civil Aviation Organization with the agreement of the United States, or "(2) any similar methodology which satisfies the criteria under section 211(o)(1)(H) of the Clean Air Act (...)" Section 40B further provides for an additional \$0.01 credit for each additional percent CI reduction above 50%, up to a maximum \$1.75/gallon credit.⁷

⁵ See "Proposed Low Carbon Fuel Standard Amendments, Public Comments Received," Comment #222, ICCT Comments on LCFS Amendments, at www.arb.ca.gov/lists/com-attach/7032-lcfs2024-VD1TO1UyUWsHb1Q9.pdf at p. 22, internal footnote 65 in ICCT comments to <https://theicct.org/publication/fuels-us-eu-cost-ekerosene-mar22/>

⁶ *Id.* at p. 22.

⁷ Inflation Reduction Act, at Sec. 40B. Sustainable Aviation Fuel Credit.

The section 40B SAF Tax Credit provides a strong financial signal to enable fulfillment of California's ambitious goals for SAF expansion and displacement of fossil jet fuel. Governor Newsom has targeted 20% clean fuels adoption in the aviation sector.⁸ The Legislature has estimated a need for at least 1.5 billion gallons of SAF blending by 2030.⁹ Moreover, in order to fulfill California's goal of achieving carbon neutrality by 2045, the 2022 CARB Scoping Plan states that 80% of all aviation fuel demand will need to come from SAF by 2045.¹⁰ While California has not yet implemented distinct targets for eFuels, Infinium anticipates that the State may follow the European Union's and United Kingdom's lead in adopting such targets in the future for the reasons indicated above by ICCT- "*their 'drop-in' advantages and theoretically unlimited supply.*"¹¹ Thus, like hydrogen, SAF and direct air capture, there are sound policy reasons to provide eFuels access to Low-CI Power through proven LCFS indirect accounting methods coupled with a new additionality component that is a refinement to the 3-year rule in the Proposed Regulation.

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cont.

For California to realize the full potential value of the SAF Tax Credit to fuel SAF and eFuel expansion, it is essential to align the LCA methodology of the LCFS with the LCA methodology established by the U.S. DOE that adheres to Clean Air Act 211(o)(1)(H) criteria as required by the IRA. On April 30, 2024, the U.S. Department of the Treasury and Internal Revenue Service ("Treasury") released guidance on the SAF Tax Credit ("SAF Credit Guidance") that was developed in close partnership with the U.S. Environmental Protection Agency ("EPA"), Department of Agriculture ("USDA") and DOE. As part of the guidance, the agencies comprising the SAF Interagency Working Group jointly announced the 40BSAF-GREET 2024 model ("40BSAF-GREET").¹²

The SAF Credit Guidance developed by Treasury, EPA, USDA and DOE demonstrates tremendous respect and recognition from the SAF Interagency Working Group to CARB and the State of California for CARB's groundbreaking work in developing the LCA methodology and regulatory structure of the LCFS program. This recognition is demonstrated by the fact that substantial components of the SAF Credit Guidance are fundamentally informed by the LCFS and that various components of CARB's LCFS program structure are incorporated into the SAF Credit Guidance, 40BSAF-GREET and the 40BSAF-GREET Guidelines by direct reference to LCFS regulatory provisions.

In the last major LCFS rulemaking, CARB recognized the vital importance of enabling Low-CI power sourcing to electrify transportation and established a policy structure that enabled two categories of LCFS credit generators to choose Low-CI electricity over grid mix power. Specifically, CARB authorized the

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⁹ See AB1322 (Rivas) available at https://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=202120220AB1322. AB 1322 was passed by the California assembly in 2022 and later vetoed by Governor Newsom, who, in his veto letter, supported the legislature's intent with the bill and ordered CARB to develop a "plan to reduce greenhouse gas emissions through the production and use of sustainable aviation fuels by July 1, 2024". Governor Newsom's veto letter available at <https://www.gov.ca.gov/wp-content/uploads/2022/09/AB-1322-VETO.pdf?emrc=7598b6>

¹⁰ See CARB, 2022 Scoping Plan for Achieving Carbon Neutrality. December 2022. https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp_1.pdf. Page 73. The Scoping Plan scenario envisions 20% of aviation fuel demand met by electricity (batteries) or hydrogen (fuel cells) in 2045, with sustainable aviation fuel meeting the remaining 80%.

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¹² U.S. Department of the Treasury, "Biden-Harris Administration Partners Announce Updated GREET Model to Measure Lifecycle Emissions from Sustainable Aviation Fuels," April 30, 2024, at <https://home.treasury.gov/news/press-releases/jy2307>; U.S. Department of Energy, "Guidelines to Determine Lifecycle Greenhouse Gas Emissions of Sustainable Aviation Fuel Production Pathways using 40BSAF-GREET 2024" (April 2024), at https://www.energy.gov/sites/default/files/2024-04/40bsaf-greet_user-manual.pdf, hereafter the "SAF-GREET Guidelines."

sourcing of Low-CI power for electric vehicle usage and electrolytic hydrogen production via the use of Renewable Energy Certificates (“RECs”).¹³

175.4
cont.

By establishing an LCA methodology within the LCFS regulation for SAF and eFuels that is consistent with the 40B LCA methodology, CARB will facilitate greater development of these vitally important new fuels for the hard to abate aviation sector as well as for legacy internal combustion engines. Through this regulatory strategy, CARB will also achieve upstream emission reductions and stimulate expansion of Low-CI power generation capacity, storage and transmission.

Due to the importance of Low-CI Electricity to the production of eFuels, and the importance of eFuels to meeting both California’s 2045 carbon neutrality goal and California’s specific goals to displace fossil jet fuel with SAF, we respectfully recommend that CARB modify the proposed LCFS amendments such that eFuel production facilities are authorized to procure Low-CI power for electrolytic hydrogen production and their other energy needs via book-and-claim accounting. Our specific regulatory proposal is included as **Exhibit A** and is effectively a hybrid proposal that includes necessary components from the existing LCFS regulation section 95488.8(i), the proposed LCFS regulation section 95488.8(i), and the DOE’s section 40B guidelines.

Thank you for the opportunity to provide comments. Should you have any questions or would like additional information, please feel free to contact me at dzaziski@InfiniumCo.com.

With kind regards,



David Zaziski, Ph.D.
Vice President, Policy & Government Affairs

¹³ 17 Cal Code Reg. Sec. 95488.8(i)(1)

Exhibit A

This Exhibit shows recommended changes to the existing LCFS regulation in underline and ~~strike-out~~.

Section 95481. Definitions and Acronyms.

- (a) *Definitions.* For the purposes of sections 95480 through 95503, the definitions in Health and Safety Code sections 39010 through 39060 shall apply, except as otherwise specified in this section or sections 95482 through 95503:

(...)

(xx) “eFuel” means a fuel that is produced from captured carbon dioxide and hydrogen.

(...)

Section 95488.8.

(...)

(i) *Indirect Accounting for Renewable or Low-CI Electricity and Biomethane.*

- (1) *Book-and-Claim Accounting for Renewable or Low-CI Electricity Supplied as a Transportation Fuel or Used to Produce Hydrogen.* Reporting entities may use indirect accounting mechanisms for low-CI electricity supplied as a transportation fuel or for hydrogen production through electrolysis for transportation purposes (including hydrogen that is used in the production of a transportation fuel), provided the conditions set forth below are met:

(A) Reporting entities may report low-CI electricity used as a transportation fuel or as an input to hydrogen production delivered through the grid without regard to physical traceability if it meets all requirements of this subarticle. The low CI electricity source must have a commercial operation date that is no earlier than thirty-six months before the date when the hydrogen production facility starts production of transportation fuel. The low-CI electricity must be supplied to the grid within a California Balancing Authority (or local balancing authority for hydrogen produced outside of California) or alternatively, meet the requirements of California Public Utilities Code section 399.16, subdivision (b)(1). Such book-and-claim accounting for low-CI electricity may span only three quarters. If a low-CI electricity quantity (and all associated environmental attributes, including a beneficial CI) is supplied to the grid in the first calendar quarter, the quantity claimed for LCFS reporting must be matched to grid electricity used as a transportation fuel or for hydrogen production no later than the end of the third calendar quarter. After that period is over, any unmatched low-CI electricity quantities expire for the purpose of LCFS reporting.

A. Low-CI electricity can be indirectly supplied through a green tariff program (including the Green Tariff Shared Renewables program described in California Public Utilities Code Section 2831-2833) or other contractual electricity supply relationship that meets the

following requirements:

1. Electricity is generated by, or supplied under contract to, the pathway applicant for all environmental attributes of the claimed electricity. In order to substantiate low-CI electricity claims, the applicant must make contracts available to the Executive Officer, upon request, to demonstrate that the electricity meets the requirements of this subarticle. Generation invoices or metering records are required to substantiate the quantity of low-CI electricity produced from the renewable assets. Monthly invoices must be unredacted copies of originals showing electricity sourced (in kWh) and contracted price;
2. All electricity procured by any LSE for the purpose of claiming a lower CI must be in addition to that required for compliance with the California Renewables Portfolio Standard (described in California Public Utilities Code sections 399.11-399.32) or, for hydrogen produced outside of California, in addition to local renewable portfolio requirements;
3. Renewable energy certificates or other environmental attributes associated with the electricity, if any, are retired and not claimed under any other program with the exception of the federal RFS, and the market-based compliance mechanism set forth in title 17, California Code of Regulations Chapter 1, Subchapter 10, article 5 (commencing with section 95800). Retirement of renewable energy credits for the purpose of demonstrating Green Tariff Shared Renewables procurement to the California Public Utilities Commission does not constitute a double claim.

(2) *Book-and-Claim Accounting for Pipeline-Injected Biomethane Used as a Transportation Fuel or to Produce Hydrogen. (...)*

(...)

(3) *Book-and-Claim Accounting for Renewable or Low-CI Electricity Used to make Alternative Jet Fuel or eFuels.* Reporting entities may use indirect accounting mechanisms for low-CI electricity supplied for Alternative Jet Fuel or eFuel production, provided the conditions set forth below are met:

(A) Reporting entities may report low-CI electricity supplied for Alternative Jet Fuel or eFuel production delivered through the grid without regard to physical traceability if it meets all requirements of this subarticle. The low CI electricity source must have a commercial operation date that is no earlier than thirty-six months before the Alternative Jet Fuel or eFuel production facility starts production of transportation fuel. The low-CI electricity must be supplied to the grid within a California Balancing Authority (or local balancing authority for Alternative Jet Fuel or eFuel produced outside of California) or alternatively, meet the requirements of California Public Utilities Code section 399.16, subdivision (b)(1). Such book-and-claim accounting for low-CI electricity may span only three quarters. If a low-CI electricity quantity (and all associated environmental attributes, including a beneficial CI) is supplied to the grid in the first calendar quarter, the quantity claimed for LCFS reporting must be matched to grid electricity for Alternative Jet Fuel or eFuel production no later than the end of the third calendar quarter. After that period is over, any unmatched low-CI electricity quantities expire for the purpose of LCFS reporting;

(B) All electricity procured by any LSE for the purpose of claiming a lower CI must be in addition to that required for compliance with the California Renewables Portfolio Standard (described in California Public Utilities Code sections 399.11-399.32) or, for Alternative Jet Fuel or eFuel produced outside of California, in addition to local renewable portfolio requirements;

(C) Renewable energy certificates or other environmental attributes associated with the electricity, if any, are retired and not claimed under any other program with the exception of the federal RFS, and the market-based compliance mechanism set forth in title 17, California Code of Regulations Chapter 1, Subchapter 10, article 5 (commencing with section 95800).

May 10, 2024

The Honorable Liane M. Randolph
Chair
California Air Resources Board
(Comment submitted electronically)

RE: Infinium Operations, LLC's Recommendations to Enable California to Harness the Profound Decarbonization Potential of eFuels

Dear Chair Randolph,

175.1 Infinium Operations, LLC ("Infinium") is pleased to submit supplemental comments regarding the California Air Resources Board's ("CARB") proposed amendments to the Low Carbon Fuel Standard ("LCFS"). During the 45-day comment period, Infinium respectfully requested that CARB revisit its proposed regulation (the "Proposed Regulation") pertaining to the sourcing of low carbon intensity power ("Low-CI Power") as applied to power-to-liquid fuels ("PtL Fuels") which are also known as "eFuels." Since the filing of our prior comment, new federal policy regarding Low-CI Power has changed the policy landscape favorably for eFuels. We are therefore updating our comments regarding the optimal LCFS regulatory structure to complement this federal policy. This comment highlights the benefits of aligning the LCFS with section 40B of the Inflation Reduction Act ("IRA") to standardize Low-CI Power sourcing rules, improve economics for eFuels and enable full commercialization of this vital fuel technology.

175.2 Our 45-day comment discussed the critical importance of eFuels to decarbonizing hard to abate sectors including legacy gasoline vehicles, and long-haul aviation. We appreciate that many other stakeholders emphasized the special role of eFuels and that CARB recognizes the vital importance of eFuels. We therefore only briefly revisit this topic with additional support and reference our 45-day comment letter for its analysis and authority.¹

Our prior comment also respectfully requested that CARB enhance the LCFS program by:

1. Establishing a book-and-claim accounting system for hydrogen pipelines that is applicable outside California.
2. Establishing a book-and-claim accounting system for carbon dioxide pipelines that is applicable outside California.
3. Revising the proposed Alternative Fuel definition to account for drop-in eFuel alternatives for gasoline and diesel fuel.

We would like to reiterate the importance of these issues but do not think it necessary to update or restate any of these issues through this Comment. We therefore simply encourage review of our 45-day comment letter on these issues.²

¹ See "Proposed Low Carbon Fuel Standard Amendments, Public Comments Received," Comment #353, Comment of Infinium RE: Electrofuels, at www.arb.ca.gov/lists/com-attach/7032-lcfs2024-VD1TO1UyUWsHb1Q9.pdf at p. 2-5 (hereafter "Infinium 45-day Comment").

² *Id.* at p. 7-8.

The Critical Issue for eFuels is Access to Low Carbon Intensity Power

As further examined in this comment, the critical issue we raise is that the Proposed Regulation precludes the recognition of greenhouse gas (“GHG”) emission reductions that are achieved by sourcing Low-CI Power delivered over the grid to produce eFuels. By effectively limiting eFuel production facilities to sourcing grid power that includes fossil-based power, the Proposed Regulation precipitously increases the CI of eFuels. Because eFuels effectively convert electricity into drop-in liquid fuels, blocked access to Low-CI Power prevents LCFS credit generation. Exclusion from LCFS revenue opportunities freezes rather than catalyzes the growth of the eFuel industry and the expansion of new sources of renewable power.

The core objective of the LCFS program is the decarbonization of transportation fuels in California. LCFS credit generation opportunities are based on CI reductions achieved as compared to annual CI benchmark standards for diesel, gasoline and fossil jet fuel. Utilizing conventional gasoline as the reference fuel, Table 1 of the current LCFS regulation establishes a CI benchmark standard of 85.77 gCO₂e/MJ for 2025. In order to generate LCFS credits, fuels used as a substitute for gasoline must be certified with a CI score of less than 85.77 gCO₂e/MJ. Market participants that supply gasoline fuel into the California transportation market with a CI score in excess of 85.77 gCO₂e/MJ in 2025 generate deficits that trigger a corresponding obligation to purchase and retire LCFS credits on annual basis.

In the 45-day rulemaking package, CARB proposed to retain the existing LCFS structure for Low-CI power for electric vehicle usage as currently exists in section 95488.8(i)(1)(A)-(B). CARB proposed, however, to restrict the use of book-and-claim accounting for hydrogen to hydrogen used directly as a transportation fuel and to exclude eligibility to hydrogen used to produce a transportation fuel as reflected in proposed section 95488.8(i)(1). This proposed elimination of book-and-claim accounting for hydrogen used to produce a transportation fuel is uniquely damaging to eFuels producers. It is through the production of electrolytic hydrogen that eFuel producers convert electric energy into molecular energy that after further processing and synthesis is converted into drop-in liquid fuels that replace fossil gasoline, diesel and jet fuel. Upon the effective date of an LCFS regulation that effectively provides that electrolytic hydrogen can only be produced from grid mix electricity, eFuel producers are transformed from LCFS credit generators to LCFS deficit generators.

The following estimated CI values for eFuels were determined by internal life cycle analysis (LCA) undertaken by Infinium personnel based on non-proprietary information on eFuels. The CI estimates were made on a wells-to-wheels basis with input values from the upcoming CA-GREET4.0 model. Using these parameters, the forecasted CI score of sustainable aviation eFuel (“eSAF”) produced at an eFuel facility sited in California and utilizing California average grid mix power would exceed 180 gCO₂e/MJ. To the extent that the same eFuel facility could instead utilize book-and-claim accounting to source zero CI power under the current LCFS regulatory structure established by section 95488.8(i)(1)(A)-(B) for both its electrolytic hydrogen production and for all of its electricity use, the eSAF produced at the eFuel facility would achieve a CI score of less than 3 gCO₂e/MJ.

Thus, it is not hyperbolic to assert that the Proposed Regulation represents an existential threat to the establishment of eFuel production facilities that would serve the California market. Pursuant to Table 3 of the existing regulation, “LCFS Carbon Intensity Benchmarks for 2019 for Fuels Used as a Substitute for Conventional Jet Fuel,” an eFuel production facility providing eSAF to the California market would be delivering a fuel that exceeds the 2025 benchmark standard by over 93 gCO₂e/MJ. In contrast, an eFuel production facility that is authorized by the LCFS regulation to source all of its power via a book-

and-claim accounting system that is comparable to the current system for electrolytic hydrogen production would be supplying an eSAF to be uplifted in California with a CI score of 3, a lower CI score than currently exists for any alternative jet fuel in the pathways table.

Infinium

Infinium’s mission is to decarbonize the transportation sector through the production of eFuels, an ultra-low carbon fuel alternative to petroleum derived transportation fuels. Infinium eFuels are drop-in replacements for use in planes, ships and motor vehicles without the need for costly infrastructure changes. Infinium’s proprietary technology utilizes carbon dioxide (CO₂) that would otherwise be emitted, renewable power, and water as feedstocks to produce transportation fuels (e.g. eSAF, eDiesel and eNaphtha), with substantial reductions in lifecycle GHG carbon emissions as compared to fossil-based alternatives. Infinium is financially and strategically supported by its investors, including affiliates of Amazon, NextEra Energy, Mitsubishi Heavy Industries, SK Ventures, and AP Ventures. These world leading companies are interested in both reducing their carbon footprints and innovating solutions to current environmental issues. Infinium operates the first commercial drop-in eFuel facility in the world at its plant in Corpus Christi, Texas. Infinium announced a second commercial eFuel facility in West Texas call Project Roadrunner, which will focus primarily on the production of eSAF to decarbonize air traffic.

Low-CI Power Sourcing is Essential to the Success of eFuels

And eFuels are Essential to Successful Decarbonization

This past November, The International Council on Clean Transportation (“ICCT”) published a white paper assessing the feasibility of meeting the targets in the Biden Administration’s SAF Grand Challenge based on “resource availability, production costs, technology readiness level, and policy support.”³ ICCT’s white paper emphasized the importance of eSAF in meeting the 2050 SAF Grand Challenge goal of 35 billion gallons and stated as follows:

Though the technology remains in the demonstration phase, e-fuels have gained significant interest in Europe and other markets due to their ‘drop-in’ advantages and theoretically unlimited supply.(...) These e-fuels are estimated to be costlier than most biomass-derived SAFs in the near-future, but their costs could rapidly come down as electrolyzer technology matures and the cost of renewable electricity declines (Zhou et al., 2022).⁴

Consistent with ICCT’s recognition of the importance of eFuels in the above-referenced white paper entitled Meeting the SAF Grand Challenge, ICCT’s 45-day comment letter to the LCFS rulemaking contained the following comment and recommendation regarding eFuels:

However, we note that as written, the current guidance will restrict the use of e-fuels made from low-CI electricity, as these are not included in the current language. Thus the proposal would effectively restrict low-CI electricity from being eligible for attribution unless it was supplied via a direct electricity connection. However, it is likely that as with most green hydrogen production, grid-connected projects will have greater economic competitiveness due to a higher capacity

³ O’Malley, J., Pavlenko, N., & Kim, Y.H. (2023). Meeting the SAF Grand Challenge: Current and Future Measures to Increase U.S. Sustainable Aviation Fuel Production Capacity. International Council on Clean Transportation. Available at <https://theicct.org/wp-content/uploads/2023/11/ID-37-%E2%80%933-SAF-Grand-Challenge-white-paper-letter-40036-v3.pdf>.

⁴ Id.

factor.⁵ Therefore, to provide more flexibility for e-fuel pathways based on converting green hydrogen into other fuels, we recommend that CARB treat these pathways' use of low-CI electricity consistent with green hydrogen and direct air capture. This will still maintain crucial safeguards on project vintage, deliverability and double-counting, while providing necessary flexibility for these projects to use renewable electricity supplied via the grid.⁶

175.3
cont. As noted by ICCT, eFuels are costlier than most biomass derived SAF currently and in the near future. However, there is an opportunity to reduce the cost of eFuels as electrolyzer technology matures and the cost of renewable electricity further declines. Success in driving down the cost of both wind and solar power has been an enormous success story that has been led in the US by California policy and optimal LCFS policy design can unlock these Low-CI power sources for hydrogen, SAF and eFuels. This aligns with California's 2022 Scoping Plan's ambitious goals to expand supply and demand for hydrogen while driving down prices. The LCFS is CARB's most powerful and proven tool to introduce and scale these types of Low-CI fuel technologies.

**New Federal Policy Unlocking Low-CI Power for SAF Producers
Through Existing LCFS Regulatory Mechanisms
Should be Integrated into the LCFS for Both SAF and eFuels**

175.4 The new federal policy referenced earlier in this Comment is focused not solely on eFuels used in the aviation sector but more broadly on all types of SAF that meets the federal CI standard established by section 40B. Infinium plans to primarily produce SAF at its production facilities but also plans to produce other fuels and feedstocks such as eDiesel as an on-road fuel that meets conventional diesel specifications and eNaphtha that can be utilized as a blendstock to produce gasoline that meets conventional gasoline specifications. Because Infinium intends to produce both SAF and Low CI on-road fuels and due to the uniquely beneficial attributes of eFuels discussed previously in this letter and in our 45-day comment letter, Infinium recommends that CARB authorize indirect accounting for SAF and all eFuels. In addition, because eFuels are drop-in fuels that comply with conventional petroleum-based ASTM specifications, Infinium recommends that CARB adopt an LCFS definition of eFuels to precisely distinguish eFuels from fossil fuels for LCFS regulatory purposes.

175.5

175.6 The following overview of the newly-established federal Low-CI power sourcing structure for SAF is provided to serve as the policy basis for CARB to implement a similar LCFS regulatory structure applicable not just to SAF but also to hydrogen, direct air capture and eFuels. Under section 40B of the 2022 Inflation Reduction Act ("IRA"), a federal tax credit of \$1.25-\$1.75 per gallon was established for sustainable aviation fuel that attained a carbon intensity reduction of at least 50% (the "SAF Tax Credit") as determined by either: "(1) the most recent Carbon Offsetting and Reduction Scheme for International Aviation ("CORSIA") which has been adopted by the International Civil Aviation Organization with the agreement of the United States, or "(2) any similar methodology which satisfies the criteria under section 211(o)(1)(H) of the Clean Air Act (...)" Section 40B further provides for an additional \$0.01 credit for each additional percent CI reduction above 50%, up to a maximum \$1.75/gallon credit.⁷

⁵ See "Proposed Low Carbon Fuel Standard Amendments, Public Comments Received," Comment #222, ICCT Comments on LCFS Amendments, at www.arb.ca.gov/lists/com-attach/7032-lcfs2024-VD1TO1UyUWsHb1Q9.pdf at p. 22, internal footnote 65 in ICCT comments to <https://theicct.org/publication/fuels-us-eu-cost-ekerosene-mar22/>

⁶ *Id.* at p. 22.

⁷ Inflation Reduction Act, at Sec. 40B. Sustainable Aviation Fuel Credit.

The section 40B SAF Tax Credit provides a strong financial signal to enable fulfillment of California’s ambitious goals for SAF expansion and displacement of fossil jet fuel. Governor Newsom has targeted 20% clean fuels adoption in the aviation sector.⁸ The Legislature has estimated a need for at least 1.5 billion gallons of SAF blending by 2030.⁹ Moreover, in order to fulfill California’s goal of achieving carbon neutrality by 2045, the 2022 CARB Scoping Plan states that 80% of all aviation fuel demand will need to come from SAF by 2045.¹⁰ While California has not yet implemented distinct targets for eFuels, Infinium anticipates that the State may follow the European Union’s and United Kingdom’s lead in adopting such targets in the future for the reasons indicated above by ICCT- “their ‘drop-in’ advantages and theoretically unlimited supply.”¹¹ Thus, like hydrogen, SAF and direct air capture, there are sound policy reasons to provide eFuels access to Low-CI Power through proven LCFS indirect accounting methods coupled with a new additionality component that is a refinement to the 3-year rule in the Proposed Regulation.

175.6
cont.

For California to realize the full potential value of the SAF Tax Credit to fuel SAF and eFuel expansion, it is essential to align the LCA methodology of the LCFS with the LCA methodology established by the U.S. DOE that adheres to Clean Air Act 211(o)(1)(H) criteria as required by the IRA. On April 30, 2024, the U.S. Department of the Treasury and Internal Revenue Service (“Treasury”) released guidance on the SAF Tax Credit (“SAF Credit Guidance”) that was developed in close partnership with the U.S. Environmental Protection Agency (“EPA”), Department of Agriculture (“USDA”) and DOE. As part of the guidance, the agencies comprising the SAF Interagency Working Group jointly announced the 40BSAF-GREET 2024 model (“40BSAF-GREET”).¹²

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sourcing of Low-CI power for electric vehicle usage and electrolytic hydrogen production via the use of Renewable Energy Certificates (“RECs”).¹³

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By establishing an LCA methodology within the LCFS regulation for SAF and eFuels that is consistent with the 40B LCA methodology, CARB will facilitate greater development of these vitally important new fuels for the hard to abate aviation sector as well as for legacy internal combustion engines. Through this regulatory strategy, CARB will also achieve upstream emission reductions and stimulate expansion of Low-CI power generation capacity, storage and transmission.

Due to the importance of Low-CI Electricity to the production of eFuels, and the importance of eFuels to meeting both California’s 2045 carbon neutrality goal and California’s specific goals to displace fossil jet fuel with SAF, we respectfully recommend that CARB modify the proposed LCFS amendments such that eFuel production facilities are authorized to procure Low-CI power for electrolytic hydrogen production and their other energy needs via book-and-claim accounting. Our specific regulatory proposal is included as **Exhibit A** and is effectively a hybrid proposal that includes necessary components from the existing LCFS regulation section 95488.8(i), the proposed LCFS regulation section 95488.8(i), and the DOE’s section 40B guidelines.

Thank you for the opportunity to provide comments. Should you have any questions or would like additional information, please feel free to contact me at dzaziski@InfiniumCo.com.

With kind regards,



David Zaziski, Ph.D.
Vice President, Policy & Government Affairs

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1. Electricity is generated by, or supplied under contract to, the pathway applicant for all environmental attributes of the claimed electricity. In order to substantiate low-CI electricity claims, the applicant must make contracts available to the Executive Officer, upon request, to demonstrate that the electricity meets the requirements of this subarticle. Generation invoices or metering records are required to substantiate the quantity of low-CI electricity produced from the renewable assets. Monthly invoices must be unredacted copies of originals showing electricity sourced (in kWh) and contracted price;
2. All electricity procured by any LSE for the purpose of claiming a lower CI must be in addition to that required for compliance with the California Renewables Portfolio Standard (described in California Public Utilities Code sections 399.11-399.32) or, for hydrogen produced outside of California, in addition to local renewable portfolio requirements;
3. Renewable energy certificates or other environmental attributes associated with the electricity, if any, are retired and not claimed under any other program with the exception of the federal RFS, and the market-based compliance mechanism set forth in title 17, California Code of Regulations Chapter 1, Subchapter 10, article 5 (commencing with section 95800). Retirement of renewable energy credits for the purpose of demonstrating Green Tariff Shared Renewables procurement to the California Public Utilities Commission does not constitute a double claim.

(2) *Book-and-Claim Accounting for Pipeline-Injected Biomethane Used as a Transportation Fuel or to Produce Hydrogen. (...)*

(...)

(3) *Book-and-Claim Accounting for Renewable or Low-CI Electricity Used to make Alternative Jet Fuel or eFuels.* Reporting entities may use indirect accounting mechanisms for low-CI electricity supplied for Alternative Jet Fuel or eFuel production, provided the conditions set forth below are met:

- (A) Reporting entities may report low-CI electricity supplied for Alternative Jet Fuel or eFuel production delivered through the grid without regard to physical traceability if it meets all requirements of this subarticle. The low CI electricity source must have a commercial operation date that is no earlier than thirty-six months before the Alternative Jet Fuel or eFuel production facility starts production of transportation fuel. The low-CI electricity must be supplied to the grid within a California Balancing Authority (or local balancing authority for Alternative Jet Fuel or eFuel produced outside of California) or alternatively, meet the requirements of California Public Utilities Code section 399.16, subdivision (b)(1). Such book-and-claim accounting for low-CI electricity may span only three quarters. If a low-CI electricity quantity (and all associated environmental attributes, including a beneficial CI) is supplied to the grid in the first calendar quarter, the quantity claimed for LCFS reporting must be matched to grid electricity for Alternative Jet Fuel or eFuel production no later than the end of the third calendar quarter. After that period is over, any unmatched low-CI electricity quantities expire for the purpose of LCFS reporting;
- (B) All electricity procured by any LSE for the purpose of claiming a lower CI must be in addition to that required for compliance with the California Renewables Portfolio Standard (described in California Public Utilities Code sections 399.11-399.32) or, for Alternative Jet Fuel or eFuel produced outside of California, in addition to local renewable portfolio requirements;
- (C) Renewable energy certificates or other environmental attributes associated with the electricity, if any, are retired and not claimed under any other program with the exception of the federal RFS, and the market-based compliance mechanism set forth in title 17, California Code of Regulations Chapter 1, Subchapter 10, article 5 (commencing with section 95800).

May 9, 2024

Liane Randolph
Chair, California Air Resources Board

Steven Cliff
Executive Officer, California Air Resources Board
1001 I Street
Sacramento, CA 95814

Comment submitted electronically

RE: Sustainable Aviation Fuel Producer Group's Comments on Sourcing Low Carbon Intensity Power for Production Facilities

Dear Chair Randolph and Executive Officer Cliff:

This comment letter is submitted on behalf of the sustainable aviation fuel (SAF) Producer Group, which is composed of many of the world's leading companies producing SAF or developing SAF production facilities, including Fulcrum BioEnergy, Gevo, LanzaJet, NXTClean Fuels, Velocys, and World Energy. The SAF Producer Group commends the California Air Resources Board (CARB) for CARB's decision in a prior rulemaking to integrate alternative jet fuel¹ in the Low Carbon Fuel Standard ("LCFS"). CARB's policy leadership regarding SAF has firmly established California as the leading SAF state in the country from both a supply and demand standpoint and has placed California in the top tier of locations globally supporting the expansion of SAF.

This comment letter is focused solely on respectfully requesting that CARB empower SAF producers to access low carbon intensity (Low-CI) power both for the production of hydrogen used to produce SAF and for the production of SAF itself through a well-designed indirect accounting mechanism that reflects recent developments with the section 40B credit. Many of the SAF Producers that have joined this letter have separately commented on other aspects of the proposed rule, and we emphasize that those separate comments are the source of critical SAF industry perspective on all issues not addressed here.

¹ The LCFS defines the term "Alternative Jet Fuel" at 17 CCR §95481(a)(6) to mean: "a drop-in fuel, made from petroleum or non-petroleum sources, which can be blended and used with conventional petroleum jet fuels without the need to modify aircraft engines and existing fuel distribution infrastructure." While there are nuanced distinctions between the LCFS defined term "alternative jet fuel" and "sustainable aviation fuel," this comment letter uses the term SAF which is more widely used in the industry. Note that all further regulatory references are to 17 California Code of Regulations unless otherwise indicated.

Recent Federal SAF Policy Developments

Support SAF Expansion

176.2

Based on very recent federal policy developments, the SAF Producer Group perceives a new and critical opportunity in this LCFS rulemaking for California to maintain its lead on state-level SAF policy and to maximize alignment with emerging federal SAF policy. Specifically, CARB can address electricity-related LCFS crediting in a way that optimizes opportunities to achieve the greenhouse gas (“GHG”) emissions reductions that the State seeks to meet its goals.

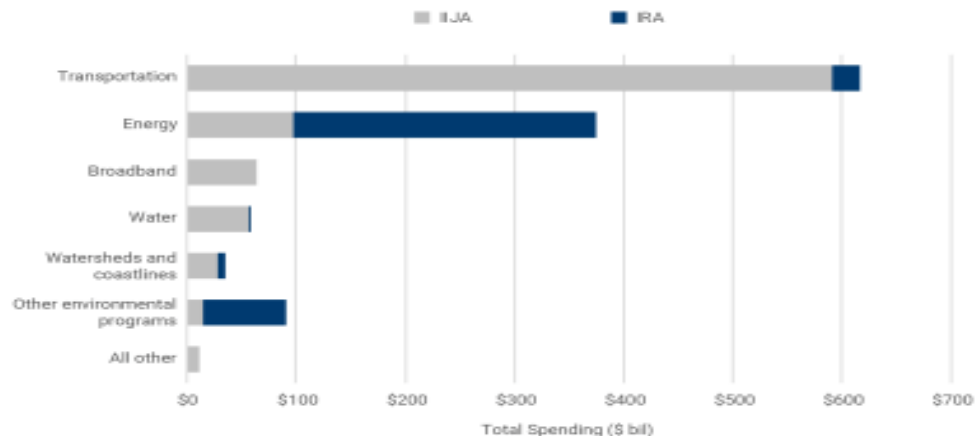
Through this regulatory strategy, CARB will also achieve upstream emission reductions and stimulate expansion of Low-CI power generation capacity, storage and transmission during the peak spending period of Inflation Reduction Act (“IRA”) and Infrastructure Investment and Jobs Act (“IIJA”). As stated in a Brookings Institute Report issued on February 1, 2023:

Between the Infrastructure Investment and Jobs Act (IIJA) and the Inflation Reduction Act (IRA), the 117th Congress invested \$1.25 trillion across the transportation, energy, water resources, and broadband sectors for the next five to 10 years. It’s now the Biden administration’s responsibility to get that historic amount of money out the door—yet the bulk of it is still sitting in federal coffers or unrealized tax credits on the federal balance sheet. (...)

After years of false starts and empty promises from Congress, the IRA is the first major federal spending response to climate change.(...) Using the same methodology as our Federal Infrastructure Hub, we can see the combined reach of the two bills.(...)²

FIGURE 1

Projected federal spending from IIJA and IRA



Note: Projected spending includes advance appropriations, budget impacts of IRA tax credits as estimated by the CBO, and a small number of authorized programs.

Source: Brookings analysis of Infrastructure Investment and Jobs Act, Inflation Reduction Act, and CBO data.

B | Brookings Metro

² Adie Tomer, Caroline George and Joseph W. Kane for Brookings Research, “The start of America’s infrastructure decade: How macroeconomic factors may shape local strategies,” at <https://www.brookings.edu/articles/the-start-of-americas-infrastructure-decade-how-macroeconomic-factors-may-shape-local-strategies/>

The Need for LCFS Support for SAF Deployment

176.2
cont.

The IRA's SAF tax credits (40B and 45Z in the IRA) provide a helpful financial signal to enable fulfillment of California's ambitious goals for SAF expansion and displacement of fossil jet fuel. Governor Newsom has targeted 20% clean fuels adoption in the aviation sector.³ The Legislature has estimated a need for at least 1.5 billion gallons of SAF blending by 2030.⁴ Moreover, in order to fulfill California's goal of achieving carbon neutrality by 2045, the 2022 CARB Scoping Plan states that 80% of all aviation fuel demand will need to come from SAF by 2045.⁵

For California to realize the full potential value of the federal SAF tax credits to fuel SAF expansion, the approach to accounting for and crediting electricity-related emissions set forth in the U.S. government's recently released guidance on the 40B SAF tax credit is instructive and should be incorporated into the LCFS program, as discussed below.

We would like to emphasize, however, that the IRA SAF tax credits should not be viewed as sufficient to enable the fulfillment of either the California goals summarized above or the federal SAF Grand Challenge goal of three billion gallons per year by 2030.⁶ The rapid development of SAF production capacity requires long-term durable policy support to attract sufficient capital to a nascent industry. Regrettably, both the 40B and 45Z tax credits are of limited duration so further policy long-term support at the state and federal level for remains essential to SAF industry expansion. While outside the scope of this LCFS rulemaking, we think it appropriate to recognize the additive value of state-level tax credits for SAF that have recently been established in Colorado, Illinois, Nebraska and Washington. We encourage CARB to continue to engage with the SAF Producer Group, the airlines, the California airports, labor unions, and other stakeholders to support additional state-level policy development.

Feasible Access to Low-CI Electricity is Essential to Produce Low-CI SAF

In the last major LCFS rulemaking, CARB recognized the vital importance of enabling low carbon intensity ("Low-CI") power sourcing to electrify transportation and established a policy structure that enabled two categories of LCFS credit generators to choose Low-CI electricity over grid mix power. CARB authorized the sourcing of Low-CI power for electric vehicle usage

³ See California Office of the Governor, Governor's Letter to Chair Randolph. July 22, 2022.

<https://www.gov.ca.gov/wp-content/uploads/2022/07/07.22.2022-Governors-Letter-to-CARB.pdf?emrc=1054d6>

⁴ See AB1322 (Rivas) available at

https://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=202120220AB1322. AB 1322 was passed by the California assembly in 2022 and later vetoed by Governor Newsom, who, in his veto letter, supported the legislature's intent with the bill and ordered CARB to develop a "plan to reduce greenhouse gas emissions through the production and use of sustainable aviation fuels by July 1, 2024". Governor Newsom's veto letter available at <https://www.gov.ca.gov/wp-content/uploads/2022/09/AB-1322-VETO.pdf?emrc=7598b6>

⁵ See CARB, 2022 Scoping Plan for Achieving Carbon Neutrality. December 2022.

https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp_1.pdf. Page 73. The Scoping Plan scenario envisions 20% of aviation fuel demand met by electricity (batteries) or hydrogen (fuel cells) in 2045, with sustainable aviation fuel meeting the remaining 80%.

⁶ See U.S. Department of Energy Bioenergy Technologies Office, Sustainable Aviation Fuel Grand Challenge, at <https://www.energy.gov/eere/bioenergy/sustainable-aviation-fuel-grand-challenge>.

and electrolytic hydrogen production including hydrogen used to produce a transportation fuel via the use of Renewable Energy Certificates (“RECs”).⁷

**To Attain its Hydrogen Expansion Goals,
CARB Must Retain Book-and-Claim for Hydrogen
Used to Produce a Transportation Fuel**

176.1

In the 45-day rulemaking package, CARB proposed to retain the existing LCFS structure for Low-CI power for electric vehicle usage as currently exists in section 95488.8(i)(1)(A)-(B). CARB proposed, however, to restrict the use of book-and-claim accounting for hydrogen to hydrogen used directly as a transportation fuel and to exclude eligibility to hydrogen used to produce a transportation fuel as reflected in proposed section 95488.8(i)(1).

As many commentators stated in their 45-day comments, we request that CARB revert to the current treatment of hydrogen such that Low-CI power sourcing via book-and-claim is available both for hydrogen used as a transportation fuel and for hydrogen used to produce a transportation fuel. We concur with CARB’s proposal to eliminate the distinction between electrolytic and non-electrolytic hydrogen but instead to allow book-and-claim for “Low-CI Hydrogen” as is referenced in the heading of proposed section 95488.8(i) and specified in proposed section 95488.8(i)(3).

Simply put, there are not enough light-duty fuel cell electric vehicles to support rapid expansion of hydrogen production. Without sufficient demand, there will not be dramatic hydrogen supply expansion as required by the 2022 Final Scoping Plan. The lack of hydrogen demand for fuel cell electric vehicles (“FCEVs”) has been established by CARB’s own analysis. According to CARB’s 2023 Annual Evaluation of Fuel Cell Electric Vehicle Deployment, just under 13,000 FCEVs are currently on the roads (making up 1.1% of all zero emission cars in California).⁸ In the same report, CARB estimated that “the projected hydrogen fueling network capacity growth is expected to stay well ahead of demand through the end of the decade. By 2029, the statewide hydrogen fueling network will have rated capacity at full availability sufficient for nearly three times the number of expected FCEVs on the road.”⁹

**Recent Federal SAF Policy Developments
Should Inform LCFS Regulatory Design**

On April 30, 2024, the U.S. Department of the Treasury and Internal Revenue Service (“Treasury”) released guidance on the SAF Tax Credit (“SAF Credit Guidance”) that was developed in close partnership with the U.S. Environmental Protection Agency (“EPA”), Department of Agriculture (“USDA”) and DOE. As part of the guidance, the agencies comprising the SAF Interagency Working Group jointly announced the 40BSAF-GREET 2024

⁷ 17 Cal Code Reg. Sec. 95488.8(i)(1)

⁸ California Air Resources Board, “2023 Annual Evaluation of Fuel Cell Electric Vehicle Deployment and Hydrogen Fuel Station Network Development,” <https://ww2.arb.ca.gov/sites/default/files/2023-12/AB-8-Report-2023-FINAL-R.pdf>.

⁹ Id.

model (“40BSAF-GREET”).¹⁰ Section 2 of the 40BSAF-GREET guidelines presents the methodology used in 40BSAF-GREET to calculate the life cycle GHG emissions of SAF production pathways via technologies currently represented in the tool. (at p. 7) Section 2.4.1 provides three available options for accounting for electricity. All three of these available options are informed by the structure that CARB separately has established within the LCFS program. Among other options established by the 40B GREET guidelines for SAF is for electricity supplied to the facility from certain zero-carbon intensity (CI) generator(s) through the purchase of RECs.” (at p. 12) This “Option 2” is referred to in the guidelines as “Specified Source Power”, and it closely tracks the LCFS book-and-claim accounting system authorized for electricity. However, the guidelines take the additional step of extending eligibility for book-and-claim accounting to SAF for lookup table pathways only and imposes an additionality component that is not included in the current LCFS regulation. As summarized in the guidelines:

40BSAF-GREET 2024 allows users to use an emissions rate associated with a given type of generator or combination of generators, provided that any electricity that is claimed to be sourced from the subject generator(s) in a given calendar year is verified via the purchase and retirement of RECs that meet specified criteria described in more detail below. These criteria align with the methodology established in the California LCFS (book-and-claim accounting for electricity is primarily addressed in CCR title 17, section 95488.8[I]). Eligible RECs are those purchased within a facility’s local balancing authority from zero-CI RPS-eligible generators as defined in the California LCFS, which are assigned a GHG-intensity of zero in 40BSAF-GREET 2024. Specifically, this includes all California RPS-eligible generator types as defined in California Public Utilities Code sections 399.11-399.36 except biomass, biomethane, geothermal, and municipal solid waste, which are not considered zero-CI by the California LCFS. Generator types that are considered zero-CI RPS-eligible as defined in California LCFS include solar thermal, solar photovoltaic, wind, RPS-eligible hydroelectric generation, ocean wave, ocean thermal, and tidal current.

Although California LCFS does offer a separate option for the purchases of RECs that include non-RPS-eligible generators (i.e., low-CI generators, such as nuclear power and fossil fuel-fired generators with carbon capture and sequestration), this requires applicants to pursue a Tier 2 LCFS pathway application process rather than the simpler Tier 1 LCFS process. Unlike the Tier 1 application process, which requires the submission of a discrete set of inputs in order to calculate the carbon intensity, the Tier 2 application process does not have a complete set of predetermined site-specific input fields and requires a detailed Life Cycle Analysis Report for the facility, as well as a public comment period.¹¹ Because of the short timeframe for the 40B tax credit relative to the timeline for

¹⁰ U.S. Department of the Treasury, “Biden-Harris Administration Partners Announce Updated GREET Model to Measure Lifecycle Emissions from Sustainable Aviation Fuels,” April 30, 2024, at <https://home.treasury.gov/news/press-releases/jy2307>; U.S. Department of Energy, “Guidelines to Determine Lifecycle Greenhouse Gas Emissions of Sustainable Aviation Fuel Production Pathways using 40BSAF-GREET 2024” (April 2024), at https://www.energy.gov/sites/default/files/2024-04/40bsaf-greet_user-manual.pdf, hereafter the “SAF-GREET Guidelines.”

¹¹ Cal. Code Regs. Tit. 17, § 95488.7. Additional information on Tier 1 and Tier 2 application processes is provided by the California Air Resources Board: <https://ww2.arb.ca.gov/resources/documents/apply-lcfs-fuel-pathway>

the Tier 2 application process, users of 40BSAF-GREET 2024 are limited to zero-CI RPS-eligible generators only. As consistent with the California LCFS, the difference between electricity consumed and RECs purchased is calculated over a three-quarter (9 month) time period. A user-friendly guide to book-and-claim electricity accounting under the California LCFS is provided in LCFS Guidance 19-01.¹² In addition, in order to claim zero CI electricity in 40BSAF-GREET 2024, generators supplying power through RECs must have a commercial operations date (COD)¹³ no earlier than 36 months prior to the placed in service (PIS)¹⁴ date of the SAF (or ethanol) facility that is purchasing the RECs. In summary, before entering specified source power (RECs, in this case) into 40BSAF-GREET 2024, ethanol or SAF facilities must obtain and retire RECs from generators that:

- *are located within the local balancing authority for the facility,*
- *have a COD no earlier than 36 months before the PIS date for the SAF (or ethanol) facility that is purchasing the RECs,*
- *are California RPS-eligible generators excluding biomass, biomethane, geothermal, and municipal solid waste (nuclear power and fossil fuel generators with CCS are also ineligible).*

We encourage CARB to replicate this model for SAF in the LCFS Regulation. The SAF Producer Group respectfully requests that CARB allow SAF to utilize Low-CI power sources that are located within the same balancing authority for the facility or are directly delivered to the balancing authority, consistent with Public Utilities Code Section 399.16. RECs used for LCFS purposes cannot be used for other regulatory purposes, such as the State's RPS requirements. The Low-CI power source must also meet an additionality criterion by demonstrating its COD is no earlier than 36 months before the PIS date for the SAF facility that is purchasing the energy and RECs.

Finally, the Low-CI power source must meet the RPS eligibility requirements. For wind, solar, and other qualifying resources, the project should be assigned a CI consistent with values listed in the look-up table. If the Low-CI power source is a biomass, biomethane, geothermal, or municipal solid waste project, its CI should be studied in a Tier 2 application process. This Tier 2 process is already established within the existing LCFS program, and the LCFS program has been authorized indefinitely so CARB is not faced with the short-term program situation that caused DOE to decline to utilize CARB's Tier 2 provision for section 40B. By including these provisions, CARB will facilitate greater emissions reductions, better position the state to meet its SAF and carbon neutrality goals, and ensure environmental integrity by requiring additionality.

¹² Low Carbon Fuel Standard Guidance 19-01 Book-and-Claim Accounting for Low-CI Electricity. https://ww2.arb.ca.gov/sites/default/files/2022-12/19-01_updated%20for%20WREGIS%20changes_ADA.pdf. (footnote in original).

¹³ The term commercial operations date or COD means the date on which a facility that generates electricity begins commercial operations. (footnote in original)

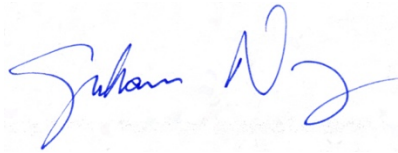
¹⁴ The placed in service (PIS) date of a facility is distinct from commercial operations date (COD). (footnote in original)

Our proposed revisions to the LCFS Regulation to effectuate this SAF specific aspects of this proposal are set forth in Exhibit A.

Conclusion

The SAF Producer Group appreciates the opportunity to comment on CARB's proposed amendments to the LCFS. We look forward to working with CARB to further tailor and ultimately implement amendments to the LCFS regulations.

Sincerely,

A handwritten signature in blue ink, appearing to read "Graham Noyes", is positioned above a horizontal line.

Graham Noyes
Noyes Law Corporation

Exhibit A

Section 95488.8

(i) Indirect Accounting for Renewable or Low-CI Electricity and Biomethane.

- (1) *Book-and-Claim Accounting for Renewable or Low-CI Electricity Supplied as a Transportation Fuel or Used to Produce Hydrogen.(...)*
- (...)
- (2) *Book-and-Claim Accounting for Pipeline-Injected Biomethane Used as a Transportation Fuel or to Produce Hydrogen. (...)*

Add new section:

- (3) Book-and-Claim Accounting for Renewable or Low-CI Electricity Used to make Alternative Jet Fuel. Reporting entities may use indirect accounting mechanisms for low-CI electricity supplied for Alternative Jet Fuel production, provided the conditions set forth below are met:
 - (A) Reporting entities may report low-CI electricity supplied for Alternative Jet Fuel production delivered through the grid without regard to physical traceability if it meets all requirements of this subarticle. The low-CI electricity must be supplied to the grid within a California Balancing Authority (or local balancing authority for Alternative Jet Fuel produced outside of California) or alternatively, meet the requirements of California Public Utilities Code section 399.16, subdivision (b)(1). Such book-and-claim accounting for low-CI electricity may span only three quarters. The low CI electricity source must have a commercial operation date that is no earlier than thirty-six months before the Alternative Jet Fuel production facility begins commissioning. If a low-CI electricity quantity (and all associated environmental attributes, including a beneficial CI) is supplied to the grid in the first calendar quarter, the quantity claimed for LCFS reporting must be matched to grid electricity for alternative jet fuel production no later than the end of the third calendar quarter. After that period is over, any unmatched low-CI electricity quantities expire for the purpose of LCFS reporting;
 - (B) All electricity procured by any LSE for the purpose of claiming a lower CI must be in addition to that required for compliance with the California Renewables Portfolio Standard (described in California Public Utilities Code sections 399.11-399.32) or, for Alternative Jet Fuel produced outside of California, in addition to local renewable portfolio requirements;
 - (C) Renewable energy certificates or other environmental attributes associated with the electricity, if any, are retired and not claimed under any other program with the exception of the federal RFS, and the market-based compliance mechanism set forth in title 17, California Code of Regulations Chapter 1, Subchapter 10, article 5 (commencing with section 95800).

May 10, 2024

Liane Randolph
Chair, California Air Resources Board

Steven Cliff
Executive Officer, California Air Resources Board
1001 I Street
Sacramento, CA 95814

Comment submitted electronically

RE: Authorizing Section 40B Book-and-Claim Accounting for Ethanol Will Enable
Decarbonization of the Light-Duty Vehicle Fleet and Attract Federal Funding to California

Dear Chair Randolph and Executive Officer Cliff:

This comment letter is submitted on behalf of a group of low carbon solution providers, ethanol fuel producers and trade associations consisting of Eco-Energy, Growth Energy, POET and the Renewable Fuels Association. This comment is focused upon the opportunity to align California policy with federal policy pertaining to book-and-claim power sourcing for ethanol facilities. Multiple agencies of the federal government have been exploring these same issues to establish guidelines and requirements under Inflation Reduction Act (“IRA”) section 40B pertaining to sustainable aviation fuel (“SAF”).

This comment letter provides our recommendations regarding the optimal Low Carbon Fuel Standard (“LCFS”) policy structure to accelerate the decarbonization of ethanol. Based on our review, we are of the opinion that the LCFS book-and-claim system should be aligned with the federal 40B SAF guidance that the SAF Interagency Working Group developed for both ethanol and SAF. Indeed, the 40B structure relies heavily on CARB’s existing LCFS book-and-claim structure for electricity used as a transportation fuel and for the production of electrolytic hydrogen. This existing LCFS regulatory structure coupled with the additionality guardrail imposed by the 40B guidance presents an excellent opportunity for CARB to establish a similar and consistent policy structure available to ethanol and other low carbon liquid fuel producers.

The Ethanol Industry is Dedicated to Decarbonization

The ethanol industry has been the most consistent workhorse in the LCFS program and was the primary source of LCFS credits during the period from 2011-2016. During the entire twelve years that the LCFS has been existence, ethanol has been an extremely reliable credit generator. There has been dramatic growth in E85 usage during the time of the LCFS program with an E85 demand of approximately 3.5 million gallons in 2011 at the advent of the program rising

dramatically to 118 million gallons by 2023.¹ However, since there a limited number of flex fuel vehicles that can utilize E85 on the road, there is a limit to E85 market expansion. Ethanol has also been limited in its opportunity to displace gasoline gallons in that California is the only state in the country that has not yet approved E15. This is a top priority of the industry, and we emphasize that the approval of E15 will enable a rapid increase in ethanol in the marketplace and a corresponding drop in fossil-based gasoline and greenhouse gas (“GHG”) emissions.

Faced with these market-access barriers, the ethanol industry has focused heavily on the decarbonization of the ethanol molecule. The carbon intensity of ethanol is falling faster than any other low carbon fuel supplied to California. Looking forward, many of the nation’s ethanol producers have committed to zero carbon ethanol production before 2050. The current proposed amendments to the LCFS program fall short of maximizing technologically feasible and cost-effective greenhouse gas emission reductions that are possible when utilizing higher blends of ethanol and indirect accounting for renewable process energy incorporation in ethanol production. We focus this comment on the issue of indirect accounting and how its integration into the LCFS program for ethanol could benefit California in a time of heavy federal spending.

177.1

The Value of Indirect Accounting

The value of indirect accounting to ethanol is best illustrated by examining the potential carbon intensity reduction that would be available to an ethanol facility that could utilize zero-CI electricity to power a thermal battery. Such a decarbonization strategy would displace both the CI associated with the electricity use and the natural gas demand of the ethanol facility. While ethanol plants vary in their CI scores based on many factors, **Exhibit A** provides the CI breakdown of a fairly typical but higher CI than average ethanol facility that has been determined to have a CI score of 69.11. Two important components of this CI score are the facility’s natural gas usage which contributes 20.5 CI points and electricity usage which contributes 4.66 points.

177.1
contd

The use of zero CI power to charge a thermal battery that would provide power and heat to the facility would zero out both the electricity and natural gas CI components and as a result drop the CI score of ethanol delivered from the facility to California to 43.95, a 36% drop in CI score. Again looking forward, the future use of carbon sequestration and storage coupled with the recognition of climate smart agricultural process to grow the facility’s feedstock would enable the same facility to deliver zero or near-zero CI ethanol to California. Given the massive deficits that persist on the gasoline side of the LCFS market, these additional CI reductions and corresponding GHG reductions delivered by ethanol would be highly valuable toward achieving California’s goal of achieving carbon neutrality by 2045.

177.1 contd

To understand the power of book-and-claim accounting to unlock federal dollars, it is necessary to examine the LCFS credit value that is driven by a switch from fossil-based power to renewable energy. For the following calculations to determine the impact of zero-CI electricity on the value of LCFS credit generation, we will use the facility’s current CI score of 69 gCO₂/MJ and compare that with a 40B/zero-CI electricity CI score of 44 gCO₂/MJ. CARB’s

¹ CARB, “Alternative Fuels: Annual E85 Volumes,” at <https://ww2.arb.ca.gov/resources/documents/alternative-fuels-annual-e85-volumes>.

LCFS Dashboard provides a credit calculator that is an excellent tool for determining the value of LCFS credits based on user inputted values for compliance year, LCFS credit price, CI score, vehicle utilized, fuel displaced, and other factors.² The following chart showing values determined by the CARB credit calculator is based on: the compliance year of 2025, the reference fuel of conventional gasoline, a vehicle-fuel EER of 1, and fuel equivalency of: dollars per gallon of ethanol. The LCFS credit prices used are low (\$50/MT), medium (\$150/MT), and high (\$250/MT) credit market scenarios. Utilizing these parameters yields the following credit values per gallon fuel, supplemental revenue for lower CI fuel, and increased revenues per year and over 15-year return on investment period.³

<u>CI Score</u>	<u>\$50/MT</u>	<u>\$150/MT</u>	<u>\$250/MT</u>
69	\$.07	\$.21	\$.34
44	\$.17	\$.51	\$.85
Premium Value	\$.10/gallon	\$.30/gallon	\$.51/gallon
Annual Premium Value @ 100 MGY	\$10,000,000	\$30,000,000	\$51,000,000
Premium Over 15 Year Return on Investment Period	\$150,000,000	\$450,000,000	\$765,000,000

Harmonization of California and Federal Policy

Will Maximize Federal Funding to California and Speed Decarbonization

In this LCFS rulemaking, CARB can and should harmonize the life cycle analysis (“LCA”) methodology that underlies LCFS crediting for ethanol with the federal LCA methodology for SAF. By establishing an LCA methodology within the LCFS regulation for ethanol that is consistent the 40B LCA methodology, CARB will facilitate greater development of this vitally important fuel source for the gasoline sector that will ultimately serve as a feedstock for alcohol to jet that will supply the hard to abate aviation sector. Through this regulatory strategy, CARB will also achieve upstream emission reductions and stimulate expansion of Low-CI power generation capacity, storage and transmission during the peak spending period of IRA and Infrastructure Investment and Jobs Act (“IIJA”).

As demonstrated in the prior analysis, the LCFS regulatory structure pertaining to Low-CI power sourcing has a material impact on the financial performance of an ethanol facility by altering the revenue stream that the LCFS programs provides to low carbon fuel production facilities that supply qualifying transportation fuels to California. While the total amount of revenue varies across the low, medium and high market scenarios, all three scenarios are highly significant in a commodity fuel market that sells fuel on basis points rather than pennies. An additional revenue stream of \$0.07 to \$0.85 per gallon of fuel produced can swing a marginal project to profitability thereby attracting debt and equity investment that would otherwise not participate. A 100 MGY

² CARB, “LCFS Data Dashboard,” Credit Value Calculator available for download via Figure 7 link, at <https://ww2.arb.ca.gov/resources/documents/lcfs-data-dashboard>

³ This calculation is not adjusted to reflect the compliance costs associated with sourcing Low-CI Power that is compliant with the LCFS book-and-claim program requirements as this information is not publicly available. Compliance does represent a significant cost that offsets a portion of the additional revenues.

ethanol facility is capital intensive requiring hundreds of millions of dollars to construct from start to finish. These facilities are long-term investments that typically will not provide a return on investment for at least a 15-year period. However, once the capital expenditure for the facility is recovered, the facility can become highly profitable thus justifying the initial investment. Over that 15-year period, the ability of an ethanol facility to source zero-CI power will deliver \$450 million in additional revenue in a medium LCFS market, \$150 million in a low LCFS market, and \$765 million dollars in a high LCFS market. It is for this reason that ethanol producers are keen to access the Low-CI power market.

Can an LCFS Regulatory Change Increase California's Access to Federal Funding?

As highlighted by a Brookings Institute Report, taken as a whole, the IIJA and IRA will deliver well over a trillion dollars to the U.S. economy over the period of a decade. It is a substantial undertaking for the federal government to establish the necessary programs, program structures, eligibility requirements, application process, and oversight for the programs.⁴ The IIJA was signed into law on November 15, 2021,⁵ and the IRA was signed into law on August 16, 2022.⁶ However, according to a comprehensive analysis released on May 8th by Politico, only a small slice of the funds have been spent. According to Politico:

- *Less than 17 percent of the \$1.1 trillion those laws provided for direct investments on climate, energy and infrastructure has been spent as of April, nearly two years after Biden signed the last of the statutes.*
- *Out of \$145 billion in direct spending on energy and climate programs in the Inflation Reduction Act, the biggest climate law in U.S. history, the administration has announced roughly \$60 billion in tentative funding decisions as of April 11. (...)*
- *And only \$125 billion has been spent from the \$884 billion provided by the infrastructure law and the pandemic law, both of which Biden signed in 2021. Roughly \$300 billion of that won't be legally available to spend until the next two fiscal years. (...)*
- *The IRA also unleashed a gusher of private company investments in clean energy and manufacturing by offering a series of tax breaks that, based on recent estimates, are worth at least \$525 billion.”⁷*

⁴ Adie Tomer, Caroline George and Joseph W. Kane for Brookings Research, “The start of America’s infrastructure decade: How macroeconomic factors may shape local strategies,” at <https://www.brookings.edu/articles/the-start-of-americas-infrastructure-decade-how-macroeconomic-factors-may-shape-local-strategies/>

⁵ U.S. Department of Transportation, “Bipartisan Infrastructure Law/Infrastructure Investment and Jobs Act,” at <https://www.phmsa.dot.gov/legislative-mandates/bipartisan-infrastructure-law-bil-infrastructure-investment-and-jobs-act-iiija>

⁶ U.S. Department of the Treasury, “Inflation Reduction Act, at <https://home.treasury.gov/policy-issues/inflation-reduction-act#:~:text=On%20August%2016%2C%202022%2C%20President,made%20in%20the%20nation's%20history>.

⁷ POLITICO, “Biden’s big bet hits reality,” by Jessie Blaeser, Benjamin Storrow, Kelsey Tamborrino, Zack Colman and David Ferris, at <https://www.politico.com/interactives/2024/biden-trillion-dollar-spending-tracker/> (emphasis in original).

**An LCFS Book-and-Claim System Consistent with the 40B SAF Tax Credit will
Drive Federal Dollars To California**

Based on the direct nexus between LCFS credit revenues and the economic viability of projects that low carbon fuel developers seek to finance and build, a group of low carbon fuel production companies have been funding a comprehensive analysis by Zero Emission Advisors and directed by NLC. This analysis has focused on the funding components contained in the IIJA and IRA that are most relevant to low carbon fuels and low carbon energy including funding designated for land restoration, feedstock development, wildfire risk management, energy generation, energy storage, large scale transmission, microgrids, waste and sanitation, advanced fuel technologies, hydrogen, SAF, hydrogen fuel cell and battery electric vehicles, alternative fuel and charging stations, and community assistance. Subsequent to the identification of all of the remaining funding opportunities that have a sufficient nexus with the low carbon fuel sector, the focus of the IRA/IIJA project has been to identify the highest value potential sources of funding for specific companies given that company's feedstock, fuel, technology, and its possible ancillary benefits. For ethanol facilities, the following were the highest value identified programs.

Site Development \$4.2B:

The first step is the strategic selection and development of the project site. The commitment to sustainable development supports targeting brownfield sites. By redeveloping these sites, the project revitalizes underutilized land and benefits from the Environmental Protection Agency's Brownfields Program, which provides essential funding for the cleanup and repurposing of these properties. Additionally, the Department of Energy's Smart Grid Investment Matching Grant Program will be instrumental in establishing the necessary infrastructure to support the facility's advanced technology and efficient energy management.

Enhanced Green Energy Integration \$500M:

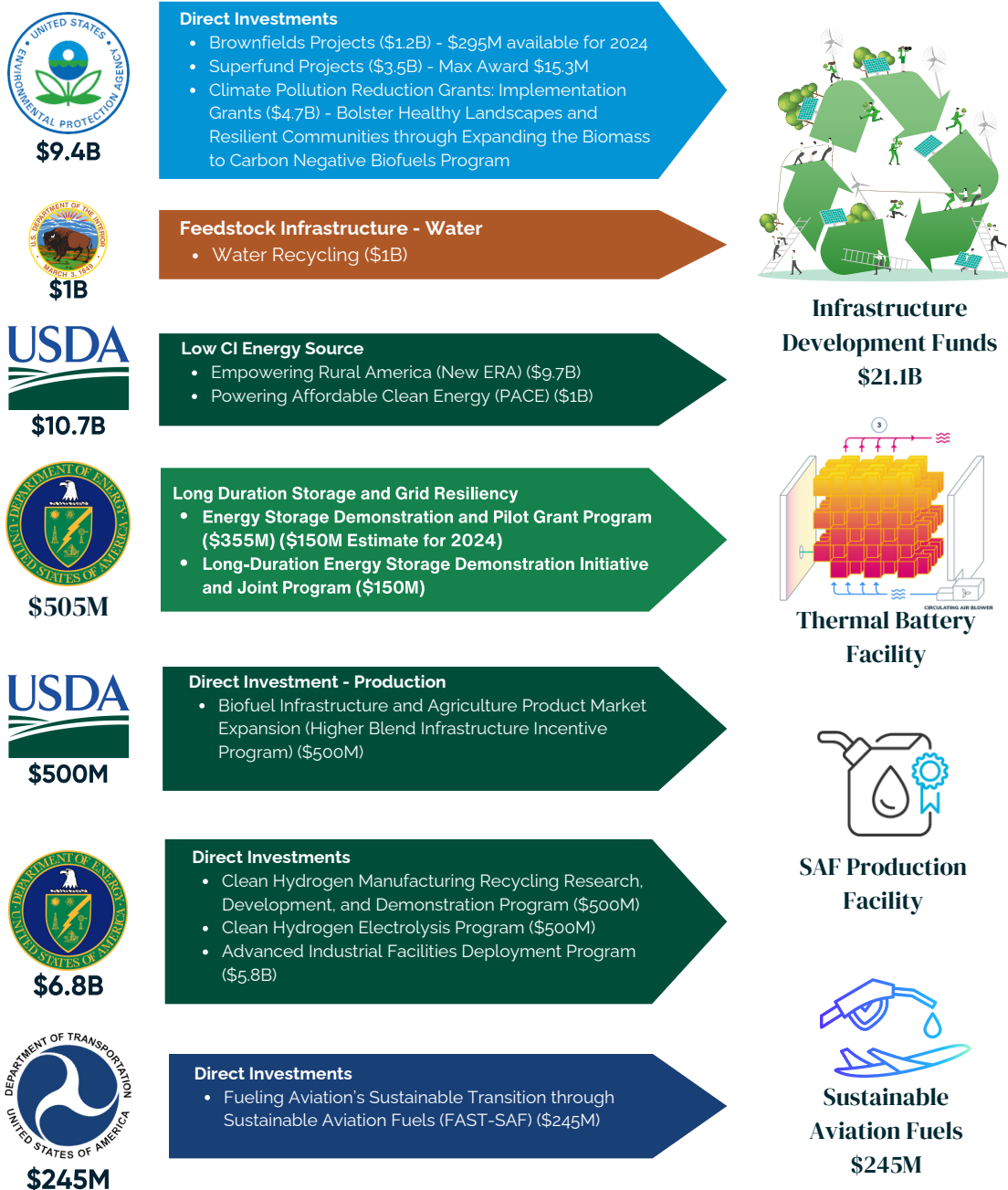
To further enhance the ethanol production facility's sustainability and resilience, the project will prioritize integrating curtailed renewable energy sources and advanced energy storage solutions, such as Thermal Batteries. The Department of Energy's Long-Duration Energy Storage Demonstration Initiative and Energy Storage Demonstration and Pilot Grant Program will provide the necessary funding to develop and deploy these cutting-edge storage technologies. By incorporating these solutions, the facility can efficiently manage intermittent renewable energy generation, ensuring a stable and reliable power supply while minimizing its carbon footprint.

CO2 Sequestration \$4.9B:

A vital aspect of the project's commitment to environmental sustainability is its focus on capturing and sequestering biogenic CO2 emissions from ethanol production. The Department of Energy's Carbon Utilization Program, Carbon Dioxide Transportation Infrastructure Finance and Innovation Program, and Carbon Storage Validation and Testing initiatives, contributing to the funding and development of advanced carbon capture, transportation, and storage technologies. By pioneering these solutions, the project will not only minimize its greenhouse gas emissions but also significantly contribute to the broader effort to combat climate change, aiming to reduce the region's CO2 emissions by 50% within the next decade.

For details of these highlighted federal funding programs and other programs with strong potential to provide funding with a nexus to an ethanol facility sited in California, please see **Exhibit B**. The following graphic depicts the various funding opportunities to the ethanol facility itself as well as to the larger system of feedstocks, transport, and carbon sequestration.

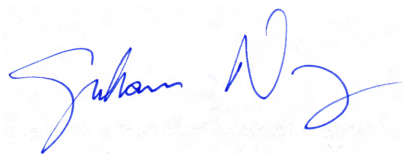
IMMEDIATE FEDERAL FUNDING AVAILABLE - ETHANOL PLANT



Conclusion

We appreciate the opportunity to provide this LCFS comment and to share the results of our analysis regarding federal funding opportunities that would be enhanced by the availability of book-and claim power sourcing for ethanol.

Sincerely,



Graham Noyes
Noyes Law Corporation

Exhibit A (Ethanol CI Table)

<u>Farming</u>	CARB Baseline	Changes to CI with Thermal Battery and Zero Emission Electricity
Farming Energy	2.96	2.96
Fertilizers + Pesticides	11.15	11.15
Field Emissions	13.83	13.83
Feedstock Transport	1.5	1.5
Total Farming	29.44	29.44
Co Product Credits	-10.88	-10.88
Ethanol Production/Transportation		
NG Boiler	20.5	0
Electric Power	4.66	0
Enzymes/Chemicals	2.02	2.02
Ethanol Transport	3.57	3.57
Total Ethanol	30.75	30.75
iLUC	19.8	19.8
Feedstock	38.36	38.36
Fuel	30.75	30.75
Total	69.11	25.16

Exhibit B

Agency	Program	Program Description	Funding Amount
Department of Agriculture	Biofuel Infrastructure and Agriculture Product Market Expansion (Higher Blend Infrastructure Incentive Program)	To provide grants through the Higher Blend Infrastructure Incentive Program, which has the goal of significantly increasing the sales and use of higher blends of ethanol and biodiesel by expanding the infrastructure for renewable fuels derived from U.S. agricultural products and by sharing the costs related to building out biofuel-related infrastructure.	\$500,000,000
Department of Agriculture	Powering Affordable Clean Energy (PACE)	To provide partially forgivable loans to renewable-energy developers and electric service providers, including municipals, cooperatives, and investor-owned and Tribal utilities, to help finance large-scale solar, wind, geothermal, biomass, hydropower projects and energy storage in support of renewable energy systems.	\$1,000,000,000
Department of Agriculture	Empowering Rural America (New ERA)	To fund the construction of electric distribution, transmission, and generation facilities for rural electric cooperatives, including system improvements.	\$9,700,000,000
Department of Energy	Advanced Industrial Facilities Deployment Program	To provide competitive financial support to owners and operators of facilities engaged in energy intensive industrial processes to complete demonstration and deployment projects that reduce a facility's greenhouse gas emissions.	\$5,812,000,000

Agency	Program	Program Description	Funding Amount
Department of Energy	Long-Duration Energy Storage Demonstration Initiative and Joint Program	To establish a demonstration initiative composed of demonstration projects focused on the development of long-duration energy storage technologies.	\$150,000,000
Department of Energy	Energy Storage Demonstration and Pilot Grant Program	To enter into agreements to carry out 3 energy storage system demonstration projects.	\$355,000,000
Department of Transportation	Fueling Aviation's Sustainable Transition through Sustainable Aviation Fuels (FAST-SAF)	To provide grant funding for eligible entities to carry out projects relating to the production, transportation, blending, or storage of sustainable aviation fuel (SAF), with the goal of accelerating the production and use of sustainable aviation fuel and reducing greenhouse gas emissions from the aviation sector.	\$244,530,000
Environmental Protection Agency	Climate Pollution Reduction Grants: Implementation Grants	To provide grants to Tribes, states, air pollution control agencies, and local governments to develop and implement plans for reducing greenhouse gas emissions.	\$4,750,000,000
Environmental Protection Agency	Superfund	The Environmental Protection Agency's Superfund program is responsible for cleaning up some of the nation's most contaminated land.	\$3,500,000,000
Environmental Protection Agency	Brownfields Projects	The Environmental Protection Agency's Brownfields Program provides funds to empower States, communities, Tribes, and nonprofit organizations to prevent, inventory, assess, clean up, and reuse brownfield sites.	\$1,200,000,000

Submitted Comment

Name

Linda Waters

Affiliation

none

Subject

LCFS -low carbon fuel 'standard' or is the S for 'scam'

Message

First, I failed to see this issue receive wide-spread public dissemination (newspapers, radio, TV, social media, etc.), so I feel that you really are not soliciting comments. Is it because this plan sells out family farms at the expense of corporate farms? Is it because it sells out the environment in the name of helping it? I only came upon the information by reading an opinion column by a small farmer. Sadly, I believe 'follow the money' is the only game in town these days.

File Upload (i.e., Attachments):

N/A

(800) 242-4450 | helpline@arb.ca.gov
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P.O. Box 2815, Sacramento, CA 95812



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May 10, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95815

RE: Proposed Low Carbon Fuel Standard Amendments

Dear California Air Resources Board Members and Staff:

We respectfully submit the following addendum to our prior comments to the California Air Resources Board (CARB) on its proposed Low Carbon Fuel Standard (LCFS) Amendments, dated February 22, 2024, which call for equitable access to book-and-claim accounting for medium- and heavy-duty (MHD) electric vehicle (EV) charging microgrids involving hydrogen and renewable natural gas (RNG) energy sources.¹

About Prologis, Inc.

Headquartered in San Francisco, CA, Prologis, is the global leader in logistics real estate, with a portfolio of over 1.2 billion square feet across four continents and approximately 2.8% of global GDP flowing through our properties each year. Prologis leases modern warehousing and distribution facilities to customers, which include manufacturers, retailers, transportation companies, third-party logistics providers, and other enterprises. Our large, flat rooftops have enabled us to build out commercial solar installations to serve onsite and offsite load with clean energy and battery storage, helping our customers reduce their emissions and placing us second in the U.S. for corporate on-site solar.

Prologis' Mobility business is helping transform the fleet and logistics industry and enabling our customers to transition to zero-emissions through industry-leading electric vehicle (EV) charging technology and solutions. With roughly 180 million square feet of industrial real estate across our California portfolio, the opportunity for us to help our customers with this transition is significant, and we are developing dedicated charging infrastructure at Prologis sites to support their medium- and heavy-duty (MHD) fleets across last mile, drayage, and other applications. In addition to providing charging solutions at our own properties, we offer electrification services at non-Prologis buildings and are developing multi-fleet charging hubs serving areas with dense concentrations of warehouses.

Amend fueling supply equipment requirements to best serve MHD fleets

Prologis echoes the broader comments submitted today by the Joint MHD EV Infrastructure Parties, especially on removing the 250kW Fueling Supply Equipment (FSE) requirement and 10 FSE cap for an important additional reason: as FSE is currently defined in LCFS regulations, and depending on which equipment houses the energy meter, it could create an unintended MHD-Fast Charging Incentive (FCI) toward multi-port all-in-one cabinets when split architectures (dispensers separate from power cabinets) are critical technology catalog options for MHD projects. *(See Figure 1)*

¹ <https://www.arb.ca.gov/lists/com-attach/7026-lcfs2024-UCBUIF0zVmKkYwVi.pdf>

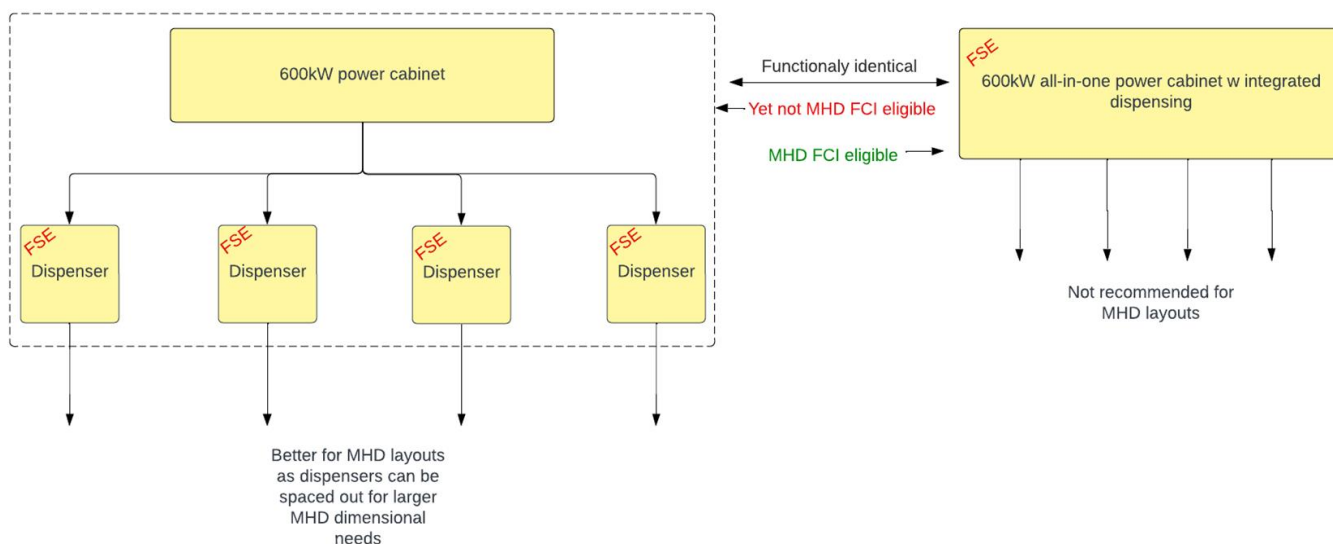


Figure 1 – Illustration of the issue caused by 250kW minimum FSE and 10 FSE maximum proposed rules in MHD-FCI

If the 250kW minimum FSE nameplate and maximum 10 count FSE per-site rules were to be adopted, it would create an unintended consequence where awkward, multi-port, all-in-one FSE designs qualify for MHD-FCI, but the functionally identical, and more ergonomic split-architecture alternatives would not. It is critical to not create this bias, as MHD layouts are significantly more sensitive to equipment placement and cable reach given the larger dimensions involved with these vehicles and the trailers that they are hauling. Site design varies widely based on MHD use case (dwell vs. corridor), and split-architecture infrastructure designs provide critical flexibility in our technology catalog for our customers. Simply removing the 250kW FSE minimum and 10 FSE maximum rules would solve the issue, while also allowing the market to self-determine how to best serve MHD fleet customers with the large-MW capacity platform of any given site.

Provide equal access to book-and-claim accounting for EV charging microgrids

We would also like to take this opportunity to reiterate the recommendations previously made by Prologis in earlier comments on revisions to LCFS, most recently in our letter dated February 20, 2024, regarding providing equitable access to book-and claim accounting for EV charging microgrids, as follows below, with one additional comment in red, as we are tracking additional technology pathways for producing hydrogen from biomethane.

Section §95488.8(i)(2)(A) states *“RNG injected into the common carrier pipeline in North America (and thus comingled with fossil natural gas) can be reported as dispensed as bio-CNG, bio-LNG, or bio-L-CNG, or as an input to hydrogen production, without regards to physical traceability.”*

MHD charging projects are in a difficult position: they are extremely capacity and energy intensive, second only to data centers in light-industrial real estate,² making them time-consuming to connect to the grid, yet they require accelerated schedules to meet fleet electrification mandates and avoid stranding EV assets. Projects in this predicament look to on-site generation with energy storage as a solution to meet fleet electrification objectives ahead of utility connections, with the added benefit of

² According to Prologis benchmarks of typical alternative uses for comparable properties

additional resiliency for critical fleet operations when the utility connection is eventually established in parallel. However, due to the exceptional energy intensity of industrial MHD charging projects on limited footprints, dispatchable power-dense on-site generation such as fuel cells or linear generators sometimes can be the only feasible technical solution that can fit the available real estate and meet the energy demand.

This important EV charging pathway for biomethane (whether RNG or hydrogen in its final delivered form for on-site generation) is not only a more energy efficient pathway for biomethane, but it also has significantly lower NOx emission profile than CNG vehicle application in sensitive disadvantaged communities around ports.³ Yet, only CNG vehicle fueling projects are incentivized with book-and-claim LCFS accounting from RNG energy sources.

As Prologis has recommended in prior comment letters, CARB should grant equitable access to biomethane book-and-claim LCFS accounting for MHD EV charging projects investing in on-site RNG/hydrogen generation that add resiliency and accelerate around transmission and distribution upgrade delays. We ask that CARB consider amending 95488.8(g)(1)(A)(2) to read as follows (changes in bold):

*“Biomethane supplied using book-and-claim accounting pursuant to section 95488.8(i)(2) and is claimed as feedstock in pathways for bio-CNG, bio-LNG, bio-L-CNG, hydrogen via steam methane reformation **or other methods, and electricity generation for co-located EV charging;**”*

Further, we suggest a revision of Section §95488.8(i)(2) to explicitly state:

*“(2) Book-and-Claim Accounting for Pipeline-Injected Biomethane Used as a Transportation Fuel or to Produce Hydrogen **or to generate Electricity**. Indirect accounting may be used for RNG used as a transportation fuel or to produce hydrogen **or to generate Electricity** for transportation purposes (including hydrogen that is used **either** in the production of a transportation fuel **or in the generation of electricity for transportation purposes**), provided the conditions set forth below are met:*

*(A) RNG injected into the common carrier pipeline in North America (and thus comingled with fossil natural gas) can be reported as dispensed as bio-CNG, bio-LNG, or bio-L-CNG, or as an input to hydrogen production, **or as an energy source for electricity generation**, without regards to physical traceability. Entities may report natural gas as RNG within only a three-quarter time span. If a quantity of RNG (and all associated environmental attributes, including a beneficial CI) is pipeline-injected in the first calendar quarter, the quantity claimed for LCFS reporting must be matched to natural gas sold in California as RNG no later than the end of the third calendar quarter. After that period is over, any unmatched RNG quantities expire for the purpose of LCFS reporting.*

*(B) Biomethane reported under fuel pathways associated with projects that break ground after December 31, 2029, injected into the common carrier pipeline, and claimed indirectly under the LCFS program for use as bio-CNG, bio-LNG, or bio-L-CNG in CNG vehicles or as an input to hydrogen production **or as an energy source for electricity generation** for transportation purposes, must demonstrate compliance with the following requirements:*

³ 0.059 gNOx/mile for a battery electric truck supported by linear generators vs. 0.317 gNOx/mile for a CNG truck per industry SME calculations provide to Prologis

*1. Starting January 1, 2041 for bio-CNG, bio-LNG and bio-LCNG pathways, and January 1, 2046 for biomethane used as an input to hydrogen production **or electricity generation**, the entity reporting biomethane must demonstrate that the pipeline or pipelines along the delivery path physically flow from the initial injection point toward the fuel dispensing facility at least 50 percent of the time on an annual basis. Entities may report natural gas as RNG within only a three-quarter time span. If a quantity of RNG (and all associated environmental attributes, including a beneficial CI) is pipeline-injected in the first calendar quarter, the quantity claimed for LCFS reporting must be matched to natural gas sold in California as RNG no later than the end of the third calendar quarter.*

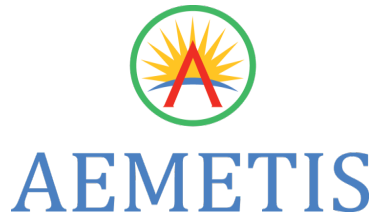
After that period is over, any unmatched RNG quantities expire for the purpose of LCFS reporting.”

Prologis believes these recommendations will further enhance CARB’s proposed improvements to the LCFS program to align with the State’s transportation electrification goals and ensure they reflect the multiple use cases supporting logistics sector fleets, including both MHD-FCI Private and Shared charging, as well as address the realities of utility energization delays and resiliency risks for charging projects.

Thank you for considering our recommendations, and we welcome the opportunity to elaborate on our views with the Board and staff. Please do not hesitate to contact me at amoch@prologis.com or 571-895-5763 for more information or to discuss our comments in further detail.

Respectfully submitted,

Alexis Moch
Vice President, Government Affairs
Prologis



May 10, 2024

Mr. Matthew Botill
California Air Resources Board
1001 I Street
Sacramento, California 95814

Re: Aemetis Comments on LCFS April 10, 2024, Workshop

Dear Mr. Botill,

As one of California's leading in-state biofuel and biogas producers, Aemetis wishes to provide comments on the CARB LCFS April 10, 2024, Workshop. We commend the diligent work that CARB staff has undertaken with the LCFS reauthorization process, and while we have remaining concerns about the proposed changes, we appreciate the openness that CARB staff has demonstrated in incorporating feedback from stakeholders.

180.1

It's clear that the LCFS program has been successful, and though there is little doubt that the program will continue to grow in the coming years, it is essential that CARB manage the program's growth in a responsible and market-responsive manner. To do so, staff must consider the impact of proposed changes from a near and long-term perspective. Failing to address both can and will have unintended consequences for the program itself, and the stakeholders who are essential to financing, building, and operating the various constituent parts of the program. Further, the lack of action to real-time market changes may delay or cancel the very projects that are required to meet the program's goals.

To that end, we offer the following suggestions to ensure continued success of the LCFS, as discussed during the April 10 Workshop:

180.2

- **Adopt a 2025 step down in the LCFS program of at least 9%** to immediately reduce the program's swollen credit bank to an appropriate level. Of the proposed step-down options presented at the Workshop, 9% provides the most certainty to rebalance the LCFS credit bank, which has long been the primary goal of this rulemaking. Given the current imbalance, a larger than 9% stepdown would certainly be warranted and appropriate and has been extensively modeled by ICF in the range of 10.5% to 11.5%.

180.3

- **Set midterm targets in the range of a 40-45% reduction by 2030.** This would better align GHG reductions from the transportation sector (the largest emitting sector of the California economy) with legislatively mandated goals for the entire economy. There should be little concern that a more aggressive approach (than proposed) can be accomplished, given the program's success and rapid deployment of credit generating projects.

- 180.4 ➤ **Allow the Automatic Accelerator Mechanism (AAM) to trigger as soon as possible, and at a lower trigger level.** This will guard against a scenario where the near-term target step down is not sufficient to address the current oversupply. The AAM mechanism should trigger when the credit bank is two times greater than quarterly deficits. If the AAM conditions are met, the corrective mechanism should trigger as soon as possible (using the 2025 data).
- 180.5 ➤ **Reiterate CARB's support of RNG's role as a central component of the LCFS.** Following the passage of SB 1383, California's efforts to reduce short-lived climate pollutants, specifically methane from agriculture, have been successfully advanced through the implementation of dairy-to-RNG projects across the Central Valley. In addition to capturing methane for conversion into negative CI RNG transportation fuel, dairy digesters have demonstrably improved air quality and reduced Greenhouse Gas emissions in local communities – many of which are disadvantaged and have been negatively impacted by pollution. Additionally, thousands of jobs have been created or supported by the construction and operation of digester projects, with billions of dollars of investment in the state's economy. The program has been very successful, and with the flexibility of RNG as both a transportation fuel and potential feedstock for clean hydrogen or electricity, it will continue to play a central role in the LCFS for decades to come. The unwarranted attacks on dairy-RNG, which lack credible data, coupled with CARB's delay in implementing more aggressive targets and pathway approvals, have shaken the confidence of investors and markets. These are dangerous signals that could impact other sectors and slow or halt the progress of key components of the LCFS.

Additionally, while not discussed at the April 10 Workshop, we remain concerned that the proposed rule unwisely shifts the LCFS RNG crediting framework. Specifically:

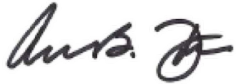
- 180.6 ➤ **A full credit true-up** remains necessary to properly recognize the true environmental performance of RNG pathways. We now have fully verified numbers demonstrating the actual GHG performance of each pathway annually. This is what LCFS crediting should be based on. Pathway approval delays unfairly impact existing projects through no fault of the operator.
- 180.7 ➤ The Proposed Rule's long term **deliverability requirements are unvetted and unproven** and therefore still problematic for RNG development. However, there is time to address this issue in future work. We encourage CARB staff to develop a dedicated public process (outside of this rulemaking) for increasing stakeholder understanding on this topic.
- 180.8 ➤ A fixed-year phase-out of avoided methane crediting—as included in the Proposed Rule—is bad public policy. **Removing a “carrot” to reduce methane from dairies is unwise unless and until a “stick” has been developed.** Any mandatory rule must be able to meet the requirements of state law. If CARB wishes to continue to promote private investment in dairy RNG projects, any switch from incentives to direct requirements to install methane control systems must be more carefully managed. The current uncertainty over which regulatory tool will be used is preventing methane reduction projects from being built.
- 180.9 ➤ **CARB must address the unreasonable processing time that currently exists for RNG Pathway approvals.** The current situation not only deprives the state from claiming the full benefit of methane abatement, but it also causes significant economic damage to the developers and investors who followed years of CARB's strong policy support and encouragement of dairy RNG projects. This again sends a very negative

180.9
cont.

message to investors in RNG projects as well as investors considering other high priority LCFS programs like hydrogen, SAF, and CCUS. The current 14–24-month processing time for Pathway approvals, coupled with a grossly oversupplied credit market, have combined to create a situation where developers are unable to meet investment repayment schedules and has had a chilling effect on future investment. Moving quickly to a default Tier-1 regime (like other biofuels) would remove the unnecessary process of review that can be appropriately shifted to qualified verification bodies. Over 100 RNG Pathway approvals have been granted by CARB, and sufficient data has been established to ensure an accurate review of current and future RNG pathways.

Thank you for the opportunity to comment on the Workshop and rulemaking process in general. We encourage you and your colleagues at CARB to move forward quickly and with confidence that the sectors regulated by the LCFS Rule will respond appropriately to a more ambitious and robust program.

Sincerely,



Andy Foster
President – Advanced Fuels
Aemetis, Inc.
andy.foster@aemetis.com

May 10, 2024

Submitted electronically via ww2.arb.ca.gov

Chair Liane Randolph and
Members of the Board
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Comments on the April 10, 2024 CARB Low Carbon Fuel Standard Public Workshop

Dear Chair Randolph and Members of the Board:

California Resources Corporation (“CRC”) appreciates the opportunity to comment on the California Air Resources Board’s (“CARB” or “the Board”) proposed amendments to the Low Carbon Fuel Standard (“LCFS”) discussed at the April 10, 2024, public workshop (the “Proposed Rules”).¹ As explained below, in addition to other aspects of the proposal, CRC believes that the Proposed Rules’ approach to LCFS credit generation for hydrogen projects is inconsistent with CARB’s December 2022 Scoping Plan (the “2022 Scoping Plan”), and, unless CARB takes steps to revise its proposal, California’s nascent low carbon hydrogen production industry will lack vital incentives necessary for the development of California’s low carbon economy.

About CRC and Carbon TerraVault Holdings, LLC

California Resources Corporation is an independent energy and carbon management company committed to the energy transition. CRC has some of the lowest carbon intensity (“CI”) production in the US and we are focused on maximizing the value of our land, mineral and technical resources for decarbonization by developing carbon capture and storage (“CCS”) and other emissions reducing projects.

Our core activities involve exploration, production, gathering, processing, and marketing of crude oil, natural gas, and natural gas liquids. We leverage advanced technologies extensively to enhance safety and boost production efficiency across our expansive mineral acreage and diverse portfolio. These cutting-edge technologies allow us to increase production while minimizing the environmental footprint of our oil and gas development operations. For more information about CRC, please visit www.crc.com.

Carbon TerraVault Holdings, LLC (“CTV”), a subsidiary of CRC, provides services that include the capture, transport and storage of carbon dioxide for its customers. CTV is engaged in a series of CCS projects that inject CO₂ captured from industrial sources into depleted underground

¹ California Air Resources Board, Proposed LCFS Amendments, <https://ww2.arb.ca.gov/rulemaking/2024/lcfs2024>.

reservoirs and permanently store CO₂ deep underground. For more information about CTV, please visit www.carbonterravault.com.

About Carbon TerraVault Joint Venture

Carbon TerraVault Joint Venture (“CTV JV”) is a carbon management partnership focused on carbon capture and sequestration development, and was formed between Carbon TerraVault, a subsidiary of CRC, and Brookfield Renewable. The CTV JV develops both infrastructure and storage assets required for CCS development in California. CRC owns 51% of the CTV JV with Brookfield Renewable owning the remaining 49% interest.

CTV JV is involved in several new clean energy initiatives. These include the Grannus Ammonia and Hydrogen Project, which expects to sequester 370,000 metric tons (“MT”) of CO₂ annually and produce clean ammonia and hydrogen in Northern California. The project aims to be California’s first clean ammonia and hydrogen facility producing 150,000 MT per annum of clean ammonia and 10,000 MT per annum of clean hydrogen. The Lone Cypress Hydrogen Project, in collaboration with Lone Cypress Energy Services, expects to sequester 100,000 MT of CO₂ per year from a new hydrogen plant, with an expansion plan to 205,000 MT and the production of 60 tons per day of hydrogen.^{2,3} Lastly, the Yosemite Hydrogen Facility, in partnership with Yosemite Clean Energy, expects to sequester 40,000 MT of CO₂ per year from a new hydrogen plant expected to produce 24,000 kilograms per day of hydrogen, with plans for two additional facilities. These projects contribute to our sustainability goals to reduce carbon emissions and promote clean energy.

Recommendations

As a California-based company committed to the energy transition, CRC supports CARB’s overall goal of achieving carbon neutrality by 2045 and reducing greenhouse gas emissions by 2045 to a level that is 85% below 1990 levels. In its Statement of Reasons for the Proposed Rules, CARB stated that “[m]eeting this goal will require the deployment of greenhouse gas emission reduction strategies *at an unprecedented scale and pace.*”⁴ However, we are concerned that many aspects of the Proposed Rules unnecessarily restrict or prohibit established and proven strategies for reducing GHG emissions in connection with the production of low-CI hydrogen from generating LCFS credits. In particular, the Proposed Rules as written would exclude low-CI hydrogen with CCS (production of hydrogen utilizing CCS to capture GHG emissions) from generating LCFS credits. The Proposed Rules seemingly only provide for LCFS credits to be generated from hydrogen produced using (1) electricity generated from renewable power sources and (2) renewable natural gas (“RNG”) as a feedstock. This proposal is inconsistent with the CARB 2022 Scoping Plan and will ultimately frustrate the deployment of low carbon hydrogen projects in California.

² Lone Cypress CDMA Press Release, California Resources Corporation (Dec. 7, 2022).

³ CRC expects that the Lone Cypress Hydrogen Project will utilize a blended feedstock consisting of natural gas and RNG, subject to the availability of RNG.

⁴ 2024 LCFS Amendments Staff Report: Initial Statement of Reasons at 4 (Dec. 2023) [hereinafter “Initial Statement of Reasons”] (emphasis added).

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As discussed in greater length below, we respectfully request that prior to finalization of the Proposed Rules, CARB:

- 181.3 — Revise the definition of the term “renewable hydrogen” in the proposed LCFS amendments to allow for the use of CCS to be consistent with the 2022 Scoping Plan;
- 181.4 — Expand the LCFS crediting requirements for hydrogen fueling infrastructure to explicitly acknowledge that low-CI hydrogen with CCS can be used to meet the carbon intensity targets;
- 181.5 — Revise and broaden the refinery crediting program to allow for the use of CCS;
- 181.6 — Clarify that book-and-claim accounting can be used to support LCFS credit generation when RNG is used to generate electricity utilized for hydrogen production and direct air capture projects;
- 181.7 — Reverse the proposed crediting changes for solar innovative crude projects;
- 181.8 — Validate the OPGEE 3.0b model against current California data sources and emissions; and
- 181.9 — Evaluate appropriate default values used in OPGEE so that US production practices are not assumed for production in other countries.

- 181.10 These seven requests largely stem from regulatory inconsistencies and counterproductive consequences associated with the Proposed Rules, including 1) conflicts between the amendments and CARB’s 2022 Scoping Plan, 2) negative impacts to California’s climate goals, and 3) harmful financial effects, including risk of stranding assets.

California Resource Corporation’s Concerns with the Proposed LCFS Amendments

1. The Proposal is Inconsistent with CARB’s 2022 Scoping Plan and Will Frustrate Deployment of Low Carbon Hydrogen

Assembly Bill (“AB”) 32 requires CARB to develop a Scoping Plan which lays out California’s strategy for meeting the state’s climate goals and update the Scoping Plan every five years.⁵ The 2022 Scoping Plan provides a detailed pathway to achieve targets for carbon neutrality and reduce anthropogenic GHG emissions by 85% below 1990 levels no later than 2045.

- 181.11 Hydrogen production plays a critical role in meeting these goals per the 2022 Scoping Plan. In order to achieve these ambitious climate targets, the 2022 Scoping Plan recognized that **1,700 times** the current hydrogen supply will be required by 2045.⁶ AB 32 requires that any CARB scoping plan embrace “technologically feasible and cost-effective reductions in GHG emissions.”⁷ The 2022 Scoping Plan follows that statutory directive, but the Proposed Rules do not.

⁵ Cal. Code Regs. Title 17, § 38561.(a)-(h) (2023).

⁶ California Air Resources Board, *2022 Scoping Plan for Achieving Carbon Neutrality*, at 8 (Dec. 2022) [hereinafter “CARB 2022 Scoping Plan”].

⁷ AB 32 § 38561.(a) “[CARB] shall prepare and approve a scoping plan, as that term is understood by the state board, for achieving the **maximum technologically feasible and cost-effective reductions** in greenhouse gas emissions [emphasis added].”

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The massive scaling of low carbon hydrogen projects necessary to meet the goals of the 2022 Scoping Plan requires an “all of the above” approach to low carbon hydrogen production and ensuring that sufficient supportive financial incentives are in place. LCFS credits represent a potentially critical financial incentive for low or zero carbon hydrogen projects. However, based on how CARB proposes to define “renewable electricity” (and incorrectly assign that electricity a carbon intensity of zero), hydrogen production would generally only be eligible to generate LCFS credits if it involves: (1) the electrolysis of water or aqueous solutions using renewable electricity; (2) catalytic cracking, oxidation or steam methane reforming of RNG or other renewable hydrocarbons; or (3) thermochemical conversion of biomass.⁸ This narrow definition ignores, and if adopted as proposed will only serve to disincentivize, the entire low-CI hydrogen industry—a nascent but proven technology being implemented at scale in California by CRC. In light of the 1,700-fold expansion in the state’s hydrogen supply called for by the 2022 Scoping Plan, CRC believes that CARB should be encouraging *all forms* of low carbon hydrogen production.

As highlighted above, the 2022 Scoping Plan calls for a flexible approach to supporting the development of low carbon hydrogen.⁹ Specifically, the Plan makes the following key references to hydrogen and CCS:

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“For the purposes of this Scoping Plan, ‘renewable hydrogen’ and ‘green hydrogen’ are interchangeable and are not limited to only electrolytic hydrogen produced from renewables.” (page 26)

“CCS can support hydrogen production until such time as there is sufficient renewable power for electrolysis and an abundant water source.” (page 86)

“If steam methane reformation is paired with CCS, the hydrogen produced could potentially be low carbon.” (page 88)

These references were included in the final adopted version of the 2022 Scoping Plan despite multiple commenters calling on CARB to explicitly exclude CCS from its definition of hydrogen production eligible to generate LCFS credits. Adhering to the 2022 Scoping Plan requirements outlined in AB 32, CARB refused to take such a narrow approach and built flexibility into the final 2022 Scoping Plan. But merely a year later, in December 2023, CARB published the draft LCFS amendments that seem to take the opposite approach in contrast to that of the 2022 Scoping Plan. This change in the Board’s direction seems arbitrary and capricious in light of the rulemaking record.

This abrupt change in CARB’s stance towards low-CI hydrogen with CCS is further evidenced in the Board’s responses to public comments on the draft 2022 Scoping Plan. When a public commenter called for CARB to only support electrolytic hydrogen generation via renewable electricity, the Board responded by stating that:

[t]he 2022 Scoping Plan does not prescribe the energy source to produce hydrogen, and therefore, steam methane reformation paired with CCS could be considered in

⁸ 2024 LCFS Amendments, Proposed Regulation Order, 17 C.C.R. § 95481.(a).

⁹ CARB 2022 Scoping Plan at 6.

the near term to ensure a rapid transition to hydrogen and increase hydrogen availability until such time as electrolysis with renewables and biomass-based hydrogen can meet the ongoing need.¹⁰

CARB further acknowledged that because “the build-out [of renewable power generation] takes time and is additive to the growth in demand associated with electrification across the economy, the state needs to keep options open for other methods to produce zero carbon hydrogen at the scale needed to meet the projected demand.”¹¹ The Proposed Rules, however, do not embrace the approach called for in the 2022 Scoping Plan and seemingly only contemplate a role for CCS in hydrogen production when RNG is used as a feedstock.¹² Restricting LCFS crediting to hydrogen produced from CCS only when RNG is also used does not keep California’s “options open.”

The Proposed Rules ignore the technical realities associated with the time to scale the deployment of hydrogen solely produced from renewable electricity and other factors discussed below that may limit the availability of RNG as a feedstock. In this interim period, low-CI hydrogen with CCS is the only proven and scalable technology capable of meeting the demands of California’s expanding low carbon economy.¹³ Even CARB has acknowledged, in its 2022 Scoping Plan, that “[t]here is a high degree of uncertainty around the availability of solar to support both electrification of existing sectors and the production of hydrogen through electrolysis.”¹⁴ Given this uncertainty, we are concerned that CARB is playing a zero-sum game by directly linking hydrogen generation LCFS credits largely to renewable power generation. Instead of devoting renewable power supplies to meet other grid demands, these LCFS amendments would incentivize more of this new electricity generation to be devoted to hydrogen generation via electrolysis. This unnecessary competition over scarce renewable energy supplies can be avoided by revising the LCFS amendments to incentivize low-CI hydrogen with CCS as an interim solution while these other hydrogen generation technologies develop.

Moreover, CARB may be overestimating the availability of RNG for use in hydrogen production within California. Separate from the provisions related to hydrogen, the Proposed Rules would also effectively end LCFS crediting for RNG projects after 2040. Given that the RNG pathway is widely used to support the development of RNG projects, this change will remove the primary financial incentive for new RNG projects in California and for producers to send RNG to California. This is because LCFS credits are critical to making RNG projects competitive with fossil gas given the comparatively low value of environmental credits available under the federal Renewable Fuel Standard (“RFS”) and other state low carbon fuel programs. The Proposed Rule’s

¹⁰ CARB 2022 Scoping Plan Response to Comments, Appendix B at 57.

¹¹ *Id.*

¹² While the 2022 Scoping Plan used the example of CCS with hydrogen production using RNG as a feedstock as an example of low carbon hydrogen production, *see id.*, nothing in the 2022 Scoping Plan suggested that CARB viewed this as the only pathway for CCS to support low carbon hydrogen production and LCFS credit generation.

¹³ Bracci, J., et al., *Fueling the California Mobility Market with Hydrogen from Natural Gas plus Carbon Capture and Storage*, Stanford Natural Gas Initiative and Stanford Center for Carbon Storage, May 2022, at 41 (“near-term techno-economic models still point to SMR-CCS being the cheaper hydrogen generation pathway to kickstart a clean hydrogen economy in California”) [hereinafter “SCCS Study”].

¹⁴ CARB 2022 Scoping Plan at 88.

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inclusion of a limited pathway for crediting projects using RNG as a feedstock to produce hydrogen until only 2045 is unlikely to be enough to support the volumes of RNG needed meet the 2022 Scoping Plan’s goals for low-CI hydrogen. Removing RNG crediting from LCFS may result in producers sending RNG to Oregon and Washington to capture more value under those state low carbon fuel programs. In addition, demand for RNG outside of California is only expected to grow over the next several years, with New Mexico recently enacting a low carbon fuel standard and the U.S. Environmental Protection Agency’s expected eventual finalization of rules allowing RNG used in electricity generation to generate credits under the RFS. This will inevitably increase demand for RNG for non-hydrogen uses outside of California and could accordingly result in RNG supply shortfalls within the state. CARB’s assumption that sufficient RNG may be available as a feedstock for low carbon hydrogen production does not appear to consider this factor.

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The LCFS can play a critical support role in the development of California’s low carbon hydrogen economy. For example, strong market signals from the LCFS have supported increased production and use of biodiesel and other low carbon fuels.¹⁵ Even regarding CCS, a recent May 2022 study from the Stanford Center for Carbon Storage found that “LCFS is the single largest financial incentive for eligible CCS projects in California.”¹⁶ But rather than send strong market signals or incentives in support of California’s growing low carbon hydrogen industry, the Proposed Rules send the opposite signal, likely harming both the low carbon hydrogen and CCS industries. By picking winners and losers at such an early stage in the energy transition, CARB is abandoning the technology-neutral approach outlined in its own 2022 Scoping Plan where it stated that “[t]he challenge before us requires us to keep all tools on the table.”¹⁷ We believe that CARB should adopt this latter approach and reverse the restrictive course proposed in the LCFS amendments. In particular, as part of this reversal, CARB needs to revise its proposal so that low carbon hydrogen projects, regardless of pathway, feedstock and technology are eligible to receive additional LCFS credit generating opportunities.

2. Impact to State Climate Goals

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The California Climate Crisis Act (AB 1279) sets an ambitious goal, requiring the state to achieve net zero GHG emissions as soon as possible, but no later than 2045, and thereafter achieve and maintain net negative GHG emissions. CCS is critical to this endeavor; it is, importantly, a *viable* option to reduce emissions from sectors that are key contributors to California’s total emissions.¹⁸ It is also a “critical enabler” of various carbon dioxide removal pathways and a “strong complement” to other decarbonization strategies.¹⁹ In California specifically, CCS has the potential to play “a key role” in the removal of unabated carbon emissions, with potential geologic

¹⁵ CARB 2022 Scoping Plan at 191.

¹⁶ SCCS Study at 32.

¹⁷ CARB 2022 Scoping Plan at 11.

¹⁸ See Energy Future Initiatives, Standard Precourt Institute for Energy & Stanford Earth, *An Action Plan for Carbon Capture and Storage in California: Opportunities, Challenges, and Solutions*, at S-1 (Oct. 2020) [hereinafter “Action Plan”].

¹⁹ *Id.* at S-2.

sequestration capacity in the state estimated to be between 35 to 425 gigatons of CO₂e in saline aquifers and 5 gigatons of CO₂e in the largest oil and gas basins.²⁰ This could provide storage capacity for up to 1,000 years.²¹

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CARB itself has acknowledged the essential role that CCS must play in achieving California's ambitious climate goals. In fact, CARB has stated that "there is no path to carbon neutrality without carbon removal and sequestration," as indicated not just by the 2022 Scoping Plan Update but also by the IPCC's Climate Change 2022: Mitigation of Climate Change report.²² The 2022 Scoping Plan is the main regulatory document governing how CARB will approach progress toward, and the meeting of, the state's ambitious climate aims. Integral to such progress is the development of, and support of, CCS projects—without this tool, carbon neutrality will remain an illusory hope. CARB's LCFS Proposed Rules, then, are entirely inconsistent with the state's 2022 Scoping Plan, completely disregarding prior acknowledgement of the absolute necessity of CCS. CARB must return to embracing CCS as an integral part of its strategy to achieve the state's targets.

CCS represents a both foundational building block for meeting California's climate goals and acting as a bridge to support low carbon hydrogen production until sufficient renewable power generation capacity exists to actually allow for large-scale hydrogen production using only renewable electricity. Even if, as CARB has recognized, the transportation sector is headed toward electrification, low carbon hydrogen and CCS will be a key component in any strategy to decarbonize hard-to-abate industries, such as heavy manufacturing (*e.g.*, steel and cement).²³ The role of low-CI hydrogen with CCS as a necessary bridge to 100% renewable-derived hydrogen will be thwarted without the right support under the LCFS.

3. Financial Impacts

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Notwithstanding the critical role of low-CI hydrogen with CCS in meeting the state's ambitious climate goals, the Proposed Rules fail to account for the significant financial benefits CCS can provide. For example, it is estimated that the community benefits from direct air capture CCS projects *alone* in Kern County, California, could produce \$68 million a year in county property tax revenue, \$25 million to surrounding cities, and a total of 23,000 jobs.²⁴ And, in a study from Louisiana State University, the development of a CCS hub in the region was estimated to result in thousands of jobs and several hundred million dollars in potential earnings for workers in the Gulf Coast region over a five-year construction period.²⁵ However, such financial benefits for state and local governments can only be realized if the right incentives are in place. To that end,

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²⁰ See California Air Resources Board, *Achieving Carbon Neutrality in California*, at 65 (Oct. 2020).

²¹ See Action Plan at S-6.

²² California Air Resources Board, *Carbon Sequestration: Carbon Capture, Removal, Utilization, and Storage - About Webpage* (last visited May 5, 2024), <http://tinyurl.com/r46r5ucf>.

²³ See CARB 2022 Scoping Plan, Table 2-1, at 72-79.

²⁴ See Ferrell, Jake, *Carbon Removal in California: Striving Toward Environmental Justice in the Central Valley*, American University Research Center (Dec. 2023).

²⁵ See Dismukes, David E., et al., *The Economic Implications of Carbon Capture and Sequestration for the Gulf Coast Economy*, Louisiana State University Center for Energy Studies, at 4 (Mar. 2023).

CARB should ensure that any final amendments to the LCFS properly incentivize the development of CCS.

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For California to be a leader in the CCS industry, and to capitalize on the substantial financial benefits that CCS can bring, CARB should use the LCFS to incentivize additional low carbon hydrogen production. LCFS credits are critical here.²⁶ To mitigate against the expenses of production, low carbon hydrogen developers have come to rely on stacking multiple incentives, particularly following the passing of the Inflation Reduction Act in August 2022.²⁷ For CCS projects, the stacking of incentives relies not only on tax credits but also the LCFS credit.²⁸ However, by adopting the restrictive approach proposed in the LCFS amendments, CCS projects face undue capital and economic uncertainty, stymying development and, ultimately, the achievement of energy decarbonization goals. Moreover, this unnecessary barrier to market and develop CCS projects will likely result in stranded assets, the very idea of which CARB has strongly rejected in the 2022 Scoping Plan²⁹ and acknowledged it must avoid in the LCFS Proposed Rules themselves.³⁰ It is critical that CARB revise its approach to ensure that low carbon hydrogen production is economical and financially viable.

4. Book-and-Claim Accounting and Crediting Opportunities for Low-Carbon Electricity and Hydrogen Production and Direct Air Capture (“DAC”)

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CRC also requests that CARB clarify the book-and-claim accounting provisions in the Proposed Rules to allow for LCFS credit generation when low-CI electricity produced from RNG is then used to support DAC or hydrogen production. As an operator, we would like the ability to receive credits for any quantities of low-CI electricity produced onsite using RNGs, but we anticipate these initial projects to be small in scale. As a result, our low carbon operations would benefit from the ability to directly offset purchased quantities of RNG used onsite with the corresponding electricity generation credits. If CARB believes that the Proposed Rules already allow for such a crediting scheme, we request CARB issue a statement confirming that this is a valid approach.

5. Innovative Crude LCFS Credit Proposed Changes

²⁶ See *supra* n.15 and n.16.

²⁷ See Hedreen, Siri, *Stacked Tax Credits Make Green Hydrogen Economic for First Time in US*, S&P Global Market Intelligence Webpage (last visited May 5, 2024), <http://tinyurl.com/ycxf5se3>.

²⁸ See Littlefield, Anna, et al., *Decarbonization of Ethanol: Pathways to Monetization Series Part One: Stacking 45Q with Voluntary Carbon Markets*, Colorado School of Mines: Payne Institute for Public Policy (Dec. 2023); see also SCCS Study at 2 (“These [federal] tax credits, combined with Low Carbon Fuel Standard incentives, offer a strong—and urgent—business case for commercial scale blue hydrogen projects in California.”); SCCS Study at 42 (“Existing federal and state policies—the 45Q and LCFS—are key in making blue hydrogen more cost-competitive[.]”).

²⁹ *Id.* at 9 “We must avoid making choices that will lead to stranded assets and incorporate new technologies that emerge over time.”

³⁰ With respect to RNG, CARB acknowledges that, for the fuel to transition to more sectors in the long term, “the existing market signals will need to transition accordingly to avoid stranded assets and the closure of methane capture projects.” Initial Statement of Reasons at 30. The same idea is applicable to CCS projects if projects are forced to cease mid-development due to the lack of financial incentives, support and access to capital.

$$Credits_{Innov}(MT) = 511314 \times \frac{E_{electricity} \times f_{renew}}{V_{crudeproduced}} \times V_{Innov} \times C$$

Figure 1: Proposed LCFS Credits Equation for Innovative Crude Projects.

The Proposed Rules include a substantial reduction in the credits awarded to innovative crude oil produced or transported using solar or wind based electricity. As highlighted in **Figure 1**, this reduction stems from a change in the coefficient (*i.e.*, the displacement emission factor) in the equation listed above (replacing “511” with “314”) which will reduce awarded credits by approximately 40%. CRC notes that this crediting pathway has resulted in at least seventeen innovative crude oil projects to date across the state. Furthermore, our operating experience has shown that solar electricity production provides one of the best ways as an operator to directly reduce Scope 2 GHG emissions. Despite these successful emission reductions, CARB’s proposed changes to this crediting equation will impact funding investment decisions for projects currently in development. Worse still, operating projects that were financially justified based on the previous crediting equation risk becoming stranded assets if their LCFS credits are taken away.

We request CARB reverse this proposed change and keep the current displacement factor of 511. In the alternative, we request that the Proposed Rules be revised to more explicitly state that projects that have already been approved to generate LCFS credits in this manner be allowed to keep using the existing crediting equation with a potential grace period for projects currently under development. Absent these requested revisions, the arbitrary changes to the innovative crude pathway crediting scheme sets a precedent that LCFS credits cannot be relied upon when justifying long-term project investment decisions. In turn, this could impact other LCFS crediting programs—beyond just the innovative crude pathway—by creating hesitation among equity investors and lenders instead of incentivizing new projects and developments to reduce emissions.

6. OPGEE 3.0b Values for California Crude are Do Not Agree with Reported Emissions and Production

CARB proposes to amend the LCFS to update well-to-refinery gate carbon intensity (CI) for oil based on revised Oil Production Greenhouse Gas Emissions Estimator (“OPGEE”). However, OPGEE continues to use inaccurate assumptions and data for calculating the well-to-refinery gate CI of California crudes. This inaccuracy likely extends to imported crudes as well.

Oil producers in California have been measuring, reporting and auditing direct greenhouse gas emissions for over a decade. While there may be some uncertainty over methane emissions, the vast majority of greenhouse gas emissions from California producers is carbon dioxide from combustion sources, nearly all of which are measured with calibrated flow meters, sample results and applied combustion chemistry. These California scope 1 emission estimates for oil production are the most accurate in the world due to the financial impact of cap and trade and third-party verification requirements.

Likewise, electricity use is metered, third-party transacted and reported. Electricity purchases combined with the carbon intensity of the grid (which itself is comprised of measured and verified



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scope 1 emissions from generators and importers), defines the scope 2 input to the production carbon intensity.

Combining the scope 1 and scope 2 emissions with measured production provides a field's carbon intensity (CI). California producers know the carbon intensities of the fields they operate, CRC calculates the carbon intensity of production each year and reports that value in its sustainability report. The measured and calculated carbon intensity of CRC's production is approximately 30% lower than the barrel weighted average calculated using the OPGEE lookup table.

The reasons for the discrepancy between the OPGEE 3.0b model and reported emissions are likely multiple but include:

- Using 2018 data from CalGEM which was aggregated during a system transition, not verified and is now six years out of date;
- Using emission estimates from operators in other states (many without LDAR requirements or tank vapor recovery) to estimate leak rates
- Using estimated field equipment counts instead of actual inventories reported under CARB's Methane Rule

The input data for OPGEE for California fields is the most complete set used in the world, compiled by agencies under the direction of California EPA with decades of oversight of the industry. Even with the most accurate and complete inputs, the model does not accurately predict the carbon intensity of California production.

CRC requests that the model output be ground-truthed and converged to the verified GHG emissions from California's oil fields before adopting any revisions to this important policy tool.

Against this backdrop, companies in the US and Europe are being held to increasingly detailed and auditable data requirements when they report Greenhouse Gas results publicly to inform the public and investors, similar to what CARB requires under MRR for Cap and Trade. Given the costs borne by California residents for LCFS compliance which ripples through the economy, a greater level of assurance is needed than OPGEE as implemented can provide, at present. It is incumbent on CARB to assure that the model used to determine deficits is valid and the data inputs are accurate. As such, while CARB staff has reportedly completed some level of comparison between reported greenhouse gas emissions, field production and OPGEE results, the results and veracity of that work has not been made available to public disclosure.

CRC requests that a study comparing OPGEE field CIs against reported emissions and production is made available to the public for review and comment.

Even more troubling is the duplication of model outputs for fields outside California. We note that many fields have the exact same CI down to the hundredth of a gram per megajoule.

- 4 fields in New Mexico all have the same CI – 10.03 g/MJ
- 10 Canadian fields have same CI – 10.37 g/MJ
- 30 other Canadian fields have same CI - 10.68 g/MJ
- 4 Fields in Utah, Saudi Arabia and Mexico all have the same CI - 10.50 g/MJ
- 15 Nigerian fields are exactly the same – 11.71 g/MJ
- 8 Fields in Texas and Oklahoma share the same CI - 12.53 g/MJ
- 3 fields in ND model to exactly the same CI - 12.62 g/MJ

The above represents 74 fields out of 383 or about 20% that have duplicate bins of exact values. This compares with 3 CI pairs (6 fields) within California's 155 fields. Fields that share a CI value down to the hundredth of a gram per megajoule are either missing large numbers of data values forcing the model is using a default value (which is based on US production practices) or values are being averaged across whole countries and input. Either result is unscientific.

Looking into the data file used to model field carbon intensities worldwide (MCON Inputs Spreadsheet) provides further reason to question the model output. The input data for the majority of world fields is limited to unverified information from technical journals, which is itself reported by companies developing the fields. For most non-California fields, OPGEE model output is being calculated based *only* on the following inputs:

- Field age (sometimes estimated based on discovery date)
- Average field depth (as reported in an Oil and Gas Journal)
- Production per well (as reported in an Oil and Gas Journal)
- Number of wells (as reported in an Oil and Gas Journal)
- API Gravity (company website/Oil and Gas Journal)
- Ocean transportation distance lookup assuming all shipping via Very Large Crude Carriers (VLCC).

For model variables that are not known, the data input reverts to a “default” value which is derived from known data from other producers. Because of the availability of data in the United States from government sources (e.g., EPA, State Agencies), US production practices act as the default for production around the world. Production practices in the U.S. are not a valid proxy for operations around the world.

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For example, a common assumption is that gas which is not flared, vented or used is re-injected. Compounding the reinjection assumption (which is likely not correct due to the expense) are the following which are US default values: 1) the gas to oil ratio (GOR) of the field, 2) flaring ratio, and 3) venting fraction. As currently modeled by OPGEE, the CI of the vast majority of fields around the world was set at discovery. Further, there may be some motivation to inflate initial production values reported in an industry journal or on a company website which is the source of inputs for OPGEE.

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As a matter of disclosure CRC requests that CARB evaluate the uncertainty of OPGEE field crude CI introduced by the lack of field specific data used by the model and take steps to independently verify whether using default values increases that uncertainty above levels required for program integrity. As a start, we would suggest that a maximum uncertainty of 0.10 g/MJ is appropriate, based on the level which triggers incremental deficits under the rule.

Conclusion

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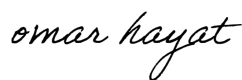
As more fully explained above, CRC recommends CARB revisit various provisions of its proposed amendments to the LCFS program with respect to low-CI hydrogen with CCS, in particular. Revisions to the Proposed Rules are necessary to ensure consistency with the 2022 Scoping Plan and, importantly, to recognize the importance of low CI hydrogen in meeting the state's ambitious climate goals. To that end, revisions to the definition of the term "renewable hydrogen" are required, alongside the expansion and broadening of LCFS crediting programs and requirements, among others, as detailed above.

CRC requests that CARB:

- Revise the definition of the term "renewable hydrogen" in the proposed LCFS amendments to allow for the use of CCS to be consistent with the 2022 Scoping Plan;
- Expand the LCFS crediting requirements for hydrogen fueling infrastructure to explicitly acknowledge that low-CI hydrogen with CCS can be used to meet the carbon intensity targets;
- Revise and broaden the refinery crediting program to allow for the use of CCS;
- Clarify that book-and-claim accounting can be used to support LCFS credit generation when RNG is used to generate electricity utilized for hydrogen production and direct air capture projects;
- Reverse the proposed crediting changes for solar innovative crude projects;
- Validate the OPGEE 3.0b model against current California data sources and emissions; and
- Evaluate appropriate default values used in OPGEE so that US production practices are not assumed for production in other countries.

CRC appreciates the opportunity to comment on the April 10, 2024 LCFS public workshop for these proposed LCFS amendments. We thank the CARB for its consideration and look forward to continued dialogue and public workshops on this matter.

Respectfully submitted,



Omar Hayat
Executive Vice President, Operations



May 10, 2024

Carolyn Lozo, Chief, Low Carbon Fuels Standard
Matthew Botill, Chief, Industrial Strategies Division
California Air Resources Board
Per email: LCFSWorkshop@arb.ca.gov

**Comments on 4/10/24 ARB Workshop on LCFS Amendments:
Recommendation: Exclude crop-based biofuels from the program**

Dear Ms. Lozo and Mr. Botill:

To maintain California's climate leadership position, ARB must make substantial changes to its Low Carbon Fuel Standard (LCFS) program. We believe the program is currently exacerbating California's greenhouse gas emissions footprint by misallocating credits, giving half to crop-based biofuels. Evidence shows that these fuels produce at least as many carbon emissions as the fossil fuels they replace.

In addition, the LCFS program fails to take into account crop-based biofuels' many harmful effects on food prices, biodiversity, water quality and availability, soil quality, and air quality. These large negative externalities alone justify excluding crop-based fuels from the LCFS program. More credits should be available for accelerating the transition to vehicles powered by electricity, so California can attain carbon neutrality by 2045.

We believe the models and data ARB uses to estimate the land use change values of both crop-based and residue-based biofuels are out-of-date, resulting in underestimated values of carbon intensity. The discount rate that ARB uses to calculate the social cost of carbon is also outdated, resulting in an underestimation of the benefits of replacing internal combustion engine vehicles with electric vehicles.

In this comment letter, we discuss the sustainability problems created by crop-based and residue-based biofuels; and propose guidelines for major changes to the LCFS program. These include:

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- Accelerate the Advanced Clean Cars II target date to 2030
- Cap crop-based and residue-based credits
- Phase out all crop-based pathways as soon as possible
- No credits for crop-based sustainable aviation fuels

An appendix discusses the disparity in the carbon intensity estimates of different national and international transportation and land use models, thus supporting our argument for phasing out credits for crop-based biofuels.

Biofuels' Impact on Natural Lands

Agricultural productivity has not been improving fast enough to meet the world's ever increasing demand for food that results from population and per capita income growth.¹ As a consequence, natural primary forests, savannas, and wetlands in many tropical countries are being converted to agriculture. **Any increase in the production of crop-based biofuels increases the conversion of primary natural land to cropland.** Natural lands not only provide numerous ecosystem services and abundant biodiversity, they are also the planet's most effective land-based means of sequestering and storing carbon.

182.6

Deforestation and land conversion are the largest contributors to climate change after the burning of fossil fuels. The Intergovernmental Panel on Climate Change (IPCC) determined that only 16% of all global land was undisturbed forest, grassland or wetlands in 2015.² This is far less than the 30-50% of Earth's land that must be conserved for "maintaining the resilience of biodiversity and ecosystem services at a global scale," according to the IPCC.³

The University of Maryland (UMD)'s Global Land Analysis and Discovery (GLAD) lab interpretation of NASA Landsat data indicates that the average rate of primary tropical deforestation has *increased* over the last five years compared to the beginning of this century.⁴ One might have expected that deforestation rates would have decreased because global population growth rates declined from 2000-2020

¹ The UN forecasts that the world's current population of 8 billion will grow by more than 2 billion before leveling off in the 2080's and global per capita income will continue to increase.

² IPCC, Special Report on Climate Change and Land, Chapter 1, Table 1.1, 2019.

³ IPCC, Climate Change 2023: Synthesis Report. Longer Report, p 73.

⁴ Weisse, M et al, Tropical Forest Loss Drops Steeply in Brazil and Columbia but High Rates Persist Overall, World Resources Institute, Global Forest Review, 4/4/24. UMD defines deforestation as human caused, permanent removal of forest cover. It does not include temporary losses from wildfires.

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and real per capita GDP grew less rapidly over the last 5 years than from 2000-2005.⁵ **The most likely explanation of the increase in the deforestation rate is the more than ten-fold increase in global production of crop-based biofuels from 2000 to 2020.**⁶ In 2023 alone tropical primary forest loss created 2.4 gigatons (Gt) of CO₂ emissions.⁷

182.7

The UN's 2014 Declaration on Forests was an agreement to end primary forest loss by 2030, but the world is not progressing towards this goal. More than 96% of the world's deforestation occurs in tropical forests,⁸ which lack basic protections. At least 90% of tropical deforestation is driven by agriculture. However, **policies that promote deforestation-free international supply chains have been limited in their ability to reduce deforestation.**⁹

CARB's proposal for dealing with deforestation risk—by tracking the chain of custody of a biofuel crop back to its origin in order to ensure it was not grown on recently deforested land—will not work either. As the Union of Concerned Scientists makes clear, there is enough cropland in the US, Brazil and Argentina that is not recently cleared forestland to supply the US with all the biofuel crops it wants, but “California won't be tracking the chain of custody of vegetable oils being used to replace those diverted from global markets” to the US by the LCFS.¹⁰ China, by far the largest importer of soybeans, imported 100 million metric tons of soybeans in 2023, while India, the largest importer of edible vegetable oils, imported 16 million metric tons of edible oils in 2023. India appears to have no deforestation certification requirements for these imports. China has supported efforts to limit deforestation-linked imports, for example by signing Brazil's Soy Moratorium, but has not taken steps to implement or enforce them.¹¹

The only feasible way for the world to achieve its goal of ending deforestation by 2030 is to phase out the use of crop-based biofuels.

182.8

The European Union (EU) recognized that consumption of crop-based biofuels needed to be capped to prevent further deforestation and food price increases

⁵ World Bank national account data for world GDP per capita (constant 2015\$).

⁶ Statista, [Biofuel production worldwide from 2000 to 2022](#), 2024.

⁷ Weisse, op. cit.

⁸ Deforestation is defined as human caused permanent removal of forest cover for some other land use. Ibid.

⁹ Pendrill, F. et al, [Disentangling the numbers behind agriculture-driven tropical deforestation](#), Science, 9/9/22.

¹⁰ Martin, J, [A Cap on Vegetable Oil-Based Fuels Will Stabilize and Strengthen California's Low Carbon Fuel Standard](#), Union of Concerned Scientists (UCS), 1/30/2024.

¹¹ Chavkin, S, [Despite billions tied to clean supply chains, China's Cofco still turns to deforesters](#), Mongabay, 2023.

182.8
cont.

resulting from consumption increases. The EU capped the level of crop-based biofuels eligible for emissions reduction credits at a country's 2020 consumption levels. Several countries have continued to decrease their caps annually. In addition, the EU recently excluded crop-based biofuels from counting towards mandated reductions in airplane and maritime greenhouse gas emissions.

Disparities in Carbon Intensity and Indirect Land Use Change Estimates for Crop-based Biofuels

182.9

The EU's decision to cap biofuels in order to halt deforestation and spikes in food prices relied on Global Biosphere Management Model (GLOBIOM) estimates of fuel carbon intensity (CI). This model, which takes into account indirect land use change (ILUC) effects, shows that vegetable seed oil-based diesel, such as diesel derived from soybean, canola, sunflower seed and palm oil, produces more carbon emissions than fossil diesel. In other words, any increase in the use of these crops to meet the demand for biomass-based diesel leads to the clearing of natural forest or grassland in tropical countries, releasing enough carbon stored on this land and sufficiently reducing the ability of the land to sequester carbon in the future, to make the life cycle carbon emissions of these vegetable oil-based diesels greater than those of fossil diesel.

182.10

There is a large disparity in the carbon intensity estimates of vegetable-seed oil-based diesel between ARB's GTAP/AEZ-EF models and the EU's GLOBIOM and other well respected transportation and land use models. GLOBIOM estimates the CI of renewable diesel made from soybean oil to be 182.9 gCO₂e/MJ, while CARB's models estimate it to be around 55gCO₂e/MJ.¹² Both GLOBIOM and GREET estimate the CI of fossil diesel to be around 94 gCO₂e/MJ. The University of Maryland's Global Change Assessment Model (GCAM) model, using up-to-date Landsat forest loss data, and the Research Triangle Institute's Applied Dynamic Analysis of the Global Economy (ADAGE) model both estimate the CI of soybean oil-based diesel to be greater than fossil diesel's, because of soybeans' large ILUC effects.¹³

Differences in the EU's GLOBIOM and ARB's GTAP model assumptions and data categories shed light on why the two models likely produce such different CI estimates. To us, many of the GTAP's assumptions, parameters and data files seem ill-suited to estimating land use change in tropical countries, where most land conversions occur, in response to US increases in biofuel production. An Appendix to this comment discusses these differences.

¹² Transport & Environment, [Globiom:the basis for biofuel policy post 2020](#), April 2016.

¹³ Lashof D, [EPA's New Renewable Fuel Standard Will Increase Carbon Emissions—Not Lower Them](#), World Resources Institute, 7/3/2023.

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CARB's December, 2023 Initial Statement of Reasons (ISOR) for its Proposed Amendments to the LCFS mentions that it has not assessed the land use change emissions associated with crop-based biofuels since 2013-2015.¹⁴ This is unacceptable, considering the Environmental Justice Advisory Committee (EJAC), appointed by ARB to make recommendations regarding the LCFS program, recommended in August 2023 that crop-based biofuel credits be capped at 2020 levels because of their unsustainability. How was ARB able to declare that the EJAC proposal did not reduce carbon emissions as much as ARB's proposal when it had not reassessed its estimated ILUC values since 2013-2015? Interpretation of Landsat data on deforestation has improved dramatically since then, providing improved time series data on deforestation and a better understanding of the variables affecting deforestation. Furthermore, ARB had to have been aware of the EU's capping of all crop-based biofuels at 2020 levels because of sustainability concerns, and of the GLOBIOM estimates showing that the carbon intensity of all vegetable seed oil-based diesel is greater than fossil diesel. The fact that ARB has not assessed ILUC values since 2013-2015 gives the appearance of an agency captured by the biofuel industries, rather than an agency making policy decisions based on the most up-to-date science. **We want to know why CARB has not proposed a cap on LCFS credits for crop-based fuels?**

182.11

ARB's same ISOR states that "waste-and-residue-based feedstocks ... are not associated with land use change impacts," but recent research disputes this.¹⁵ Used cooking oil, tallow and distiller's corn oil, the major residues used to produce biomass-based diesel in the US, have been collected in the US for use in other industries long before they were used in the biofuels industry. Domestically produced UCO and distiller's corn oil are still used for animal feed, and some tallow is still being used in the oleochemical industry. Since the supply of these residues tends to be fixed, newly produced vegetable oils are substituted for them when they are instead used in the biofuel industry. As a result, residues have ILUC effects unless they were discarded waste before being used to produce biofuels.

182.12

A recent International Council on Clean Transportation (ICCT) study estimated these ILUC values and noted that soybean oil is probably the most frequently used substitute in the US.¹⁶ The study's estimate of the CI of soybean oil is based on the EPA's carbon intensity value, which is similar to ARB's GTAP value, and so underestimates ILUC.

182.13

The study's assumption that 50% of additional UCO feedstocks will come from previously uncollected sources also seems optimistic. If

¹⁴ CARB, [Staff Report: Initial Statement of Reasons](#), (ISOR), Public Hearing to Consider the Proposed Amendments to the Low Carbon Fuel Standard, 12/19/23.

¹⁵ Ibid.

¹⁶ O'Malley, J et al, [Indirect Emissions from Waste and Residue Feedstocks: 10 Case Studies from the US](#), International Council on Clean Transportation, December 2021.

instead one assumed that only existing sources of UCO were used as feedstocks and if GLOBIOM CI values for soybean oil feedstock were used instead of EPA/CARB values, then UCO's CI would likely be similar to fossil diesel's. A recent Ceruly study reaches the same conclusion for using tallow, which has almost no opportunities for bringing new sources to market, as a feedstock in either the EU or the US.¹⁷

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For these sustainability reasons and concerns over food price increases, several organizations have recommended that ARB cap credits for these residues.¹⁸ The EU capped UCO and tallow credits for road transport at 2020 levels, but has not yet capped them for aviation and maritime use. The European Federation for Transport and Environment (T&E), the large coalition of non-governmental groups researching sustainability in transportation, is recommending that the EU cap UCO and tallow use in the aviation and maritime industries at the same percentage level as road transport.¹⁹

UCO imports have dramatically increased in both the US and EU, reaching unsustainable levels.²⁰ Many of the imports from Asia appear to be fraudulent. The EU is currently investigating allegations that Chinese UCO imports are largely mislabeled palm oil. As a result, EU imports of Chinese UCO decreased by about 600 million tons in 2023.²¹ US imports of UCO from China, on the other hand, increased by over 700 million tons in 2023, because "the U.S. is not looking at those imports with much scrutiny at this point."²² Clearly, ARB needs to put in place a system for tracing the origin of UCO imports including verifying the accuracy of the paper trail. **We want to know why CARB has not proposed a cap on LCFS credits for residue-based biofuels? Why has CARB not proposed requiring a certificate of origin for UCO pathways?**

Regrettably, the International Civil Aviation Organization (ICAO) chose a political approach to developing its Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), and as a result it allows sustainable aviation fuel (SAF) credits for crop-based biofuels. ICAO chose the average of the US GTAP and EU GLOBIOM model ILUC scores as its default ILUC values for crop starch-based sustainable aviation fuels (SAFs). However, because this approach would have prevented

¹⁷ Malins, C, The Fat of the Land, Ceruly, 2023.

¹⁸ O'Malley, J et al, Setting a lipids cap under the California Low Carbon Fuel Standard, International Council on Clean Transportation, August 2022.

¹⁹ Suzan, S, Biofuels: from Unsustainable Crops to Dubious Waste?, Transport & Environment, December, 2023.

²⁰ Ibid.

²¹ Pratt, S, Used cooking oil amount proves surprising, The Western Producer, 4/11/24.

²² Ibid.

vegetable seed oil-based fuels from receiving any credits, it arbitrarily decided to set its default ILUC values for those biofuels closer to the model with the lower score . The ICAO did try to determine the factors that led to such different ILUC estimates for seed-based biofuels in the 2 models, but then made no attempt to scientifically analyze which model was more accurate, reflecting its overall approach of adopting biofuel-positive assumptions.²³ We discuss these factors in the Appendix.

Had the ICAO made a science-based decision, using recent research and data trends, to determine ILUC values, it would likely have excluded all crop-based SAFs, including corn-based ethanol, from CORSIA. Recent US research suggests that corn ethanol has a higher CI than gasoline. One study used actual US data from 2008-2016 to calculate the additional amounts of land and fertilizer used to produce the massive increase in corn ethanol mandated by the Renewable Fuel Standard over this period.²⁴ **Using these values it estimated corn ethanol's CI to be 115.7gCO₂e/MJ, 24% higher than gasoline's CI of 93.1 gCO₂e/MJ.** The study also noted that millions of acres of Conservation Reserve Program land were converted into corn during this period.

Even more regrettable than the ICAO's compromise approach to determining CORSIA's default CI values, was the US Treasury's recent political decision to adopt GREET/GTAP CI values instead of CORSIA's for determining eligibility for SAF credits provided by the Inflation Reduction Act (IRA). The Biden Administration's voluntary SAF Grand Challenge sets an annual target of 3 billion gallons of sustainable aviation fuel (SAF) by 2030 and 35 billion gallons by 2050. **Currently, almost all the SAF used in the US is made from vegetable seed oils and residue oils. However, ethanol companies plan on meeting the IRA's requisite 50% reduction in carbon emissions, for receiving up to \$1.75 per gallon of SAF, by adding carbon, capture and storage (CCS) to their production facilities. Pathways for this highly unsustainable method of producing SAF should be excluded from the LCFS program.**

Other Ways to measure harmful effects of crop-based fuels

A recent EU study estimated what global carbon emission reductions would be if the land used to grow its biofuels were instead returned to nature.²⁵ The study estimated that greenhouse gas reductions from re-wilding, plus greater use of zero-emission vehicles, would be 25-33 million tons greater than those from using biofuels, even if

²³ Malins, C, [Understanding the Indirect Land Use Change Analysis for CORSIA](#), Cerulogy, December 2019.

²⁴ Lark, T, [Environmental Outcomes of the US Renewable Fuel Standard](#), Proceedings of the National Academy of Sciences, 2/2022.

²⁵ Fehrenbach, H et al, [The Carbon and Food Opportunity Costs of Biofuels in the EU27 plus the UK](#), Transport and Environment, 2023.

ILUC effects were ignored.²⁶ The study's goal was to highlight the importance of "land as a scarce and precious resource".²⁷

The same study calculated that if the 24 million acres of global cropland used to grow crops to produce the biofuels consumed annually in the EU, were instead used to grow crops to feed people, an additional 221 million people could be fed annually, assuming an average daily intake of 2200 kcal per capita. The US, which produces and consumes more crop-based biofuels than any other country, devotes over 60 million acres, one fifth of its cropland area, to growing corn and soybeans for ethanol and biomass-diesel.²⁸ The EU study implies that this amount of land could instead be used to feed an additional 552 million people annually. Brazil, the second largest producer and consumer of crops for biofuels, devotes around 35 million acres a year to growing soybeans, sugarcane and corn for biomass-based diesel and ethanol for domestic use. Indonesia uses 9 million acres to grow palm oil for biomass-based diesel for domestic use.²⁹ If the US, the EU, Brazil and Indonesia stopped consuming biofuels, enough cropland would become available to feed about 1.2 billion more people annually. This might make eliminating deforestation by 2030 a realistic goal.

Additional Negative effects of LCFS credits for crop-based biofuels

Corn and soybeans account for over 50% of US harvested acreage, almost half of this is used for biofuels. The monocultural farming techniques employed by these two crops perpetuate the rural biodiversity crisis and worsen soil quality. Corn and soybeans' heavy use of synthetic fertilizers, toxic pesticides, and herbicides is greatly increasing ground and surface water pollution. In addition, the unsustainable withdrawal of water from US aquifers is increased by growing crops for biofuels.

Recent growth in US renewable diesel (RD) consumption, primarily for California's market, has reached unsustainable levels.³⁰ The rapid growth in renewable diesel consumption in California from 2021-2023 resulted in global vegetable oil prices

²⁶ Their re-wilding estimate excluded the amount of land needed to provide photovoltaic solar to charge ZEVs enough to drive the same number of miles that biofuels were powering. The study assumed increased carbon sequestration from re-wilding would vary by region, it calculated results for the replacement of crops grown in the EU as well as those grown abroad and it estimated average annual sequestration rates over a 30 year period.

²⁷ Fehrenbach, op.cit.

²⁸ US Agricultural Census, 2022 and USDA crop surveys.

²⁹ USDA, GAIN annual publications: Oil Seeds and Products Annual, Brazil, 4/25/23 and 3/22/24; Sugar Annual, Brazil, 4/18/24; Cereals Annual, Brazil, 2023; Oilseeds and Products Annual, Indonesia, 3/20/23 and 3/20/24.

³⁰ Martin, J, A Cap on Vegetable Oil-Based Fuels Will Stabilize and Strengthen California's Low Carbon Fuel Standard, Union of Concerned Scientists (UCS), 1/30/2024.

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almost doubling from 2020-2022.³¹ This was especially devastating for people in developing countries who spend half their income on food. The 4/10/24 CARB workshop presentation of a chart showing global vegetable oil prices dropping in 2023 is not encouraging when one considers that the price drop resulted from the global production of soybean, rapeseed, sunflower seed, palm kernel and palm oils increasing almost 9% over the three year period.³² Global Forest Watch satellite data show tropical primary forest loss increased 10% from 2021-2022.³³ Also, the same United Nations Food and Agriculture Organization (FAO) food price Index shows global food prices increased annually by 3.8% from 2000 to 2023, but cooking oil prices increased annually by 4.8%, more than any other category.³⁴ The US CPI Index for Food increased by 21% during the 3 year period 2021-2023, but the US CPI Index for Fats and Oils Consumed at Home increased 35%.

Social Cost of Carbon (SCC) used to calculate LCFS benefits

182.16

ARB is using a lower SCC in its cost-benefit analyses than the federal government. The Biden Administration recently increased its SCC from \$51 per mt CO₂ to \$190 per mt CO₂ and decided to use a 2% discount rate to evaluate estimated carbon costs in the future. ARB appears to be still using the old \$51 per mt CO₂ value and a 3% discount rate.³⁵ This results in a lower estimation of the benefits of replacing internal combustion (ICE) vehicles with electric vehicles. For example, using the lower SCC of \$51 per mt CO₂ and 3% discount rate used by ARB result in a SCC of \$63 per mt CO₂ for 2025 and \$68 per mt CO₂ for 2030. Using the higher SCC of \$190 per mt CO₂ and 2% discount rate result in a SCC that is more than 3 times greater, \$210 per mt CO₂ for 2025 and \$230 per mt CO₂ for 2030.³⁶ We recommend that CARB adopt the higher SCC and the lower discount rate used by the federal government. This would produce an estimate for the benefits of electrifying transportation more rapidly that is more in line with the opinions of scientists, and possibly justify increasing LCFS credits for ZEVs by a factor of three. It also strengthens the argument for including more credits for rebates for zero emission cars and trucks in the LCFS program.

In short, the LCFS program relies on CI numbers for both crop-based and residue-based fuels that are highly uncertain. They do not comport with European

³¹ Food and Agriculture Organization (FAO) Food Price Index, annual, 1990-2024, 2014-2016=100.

³² Statista, [Production of major vegetable oils worldwide from 2012/13 to 2023/2024 by type](#), 2024.

³³ Weisse, M et al, op. cit.

³⁴ FAO Food Price Index, op. cit.

³⁵ CARB, ISOR, op cit., p. 40 and the White House, [Biden-Harris Administration Releases Final Guidance to Improve Regulatory Analysis](#), 11/9/23.

³⁶ Institute for Policy Integrity, [EPA Values for the Social Cost of Greenhouse Gases](#), New York University School of Law.

- 182.17 model results or with the latest research. CARB's proposed certification of origin requirement is more appropriate for used cooking oil than for crop-based fuels. Incentives for road transport should concentrate on electrification, reserving limited UCO and tallow supplies for aviation. All crop-based subsidies should be phased out by 2030 at the latest and credits for soybean oil-based diesel should be phased out immediately.
- 182.18 Many of our proposed recommendations for the LCFS program mirror T&E's recommendations to the EU regarding their biofuel mandates.³⁷ Allocating annual credits of up to \$2 billion for crop-based biofuels in the absence of reliable data showing that this is reducing greenhouse gas emissions is unacceptable.

Our proposals:

- 1) **Adjust LCFS crediting to facilitate the goal of accelerating Advanced Clean Cars II rules, so all new light-duty vehicle sales can be zero emission by 2030.**

- 182.19 This is definitely doable. Norway will require all new passenger vehicle sales in 2025 to be ZEV, only 7 years after its new ZEV market share reached 21%. California reached the same 21% market share in 2023, surpassing its 2025 ZEV sales target of 1.5 million by 300,000.³⁸ In a 2022 survey of Californians half the respondents said they would seriously consider buying an EV.³⁹ Norway's success resulted from policies that made EVs both cheaper to purchase than comparable ICE vehicles and cheaper to drive, e.g. by lowering bridge and road tolls and municipal parking fees for ZEVs. If Norway, a country with many cold winter months, that effectively reduce ZEV driving range by 20%, can transition to ZEVs as quickly as it has, certainly California should be able to do the same.

Another indication that accelerated adoption of ZEVs should be possible sooner than expected is the development of inexpensive Chinese models that are already selling well in Asia. BYD's Seagull introduced last year in China for \$10,000 and this year in Brazil and Mexico for about \$20,000 is the cheapest, though it still offers a range of 186 miles with the possibility of upgrading to 236 miles for an additional \$3000.⁴⁰ This is putting pressure on US and European manufacturers to design cheaper ZEV models.

California recently reached a light-duty charging station total of 100,000, well behind its 2025 target of 250,000 stations. However, California is scheduled to receive more than \$380 million of federal funds to create charging infrastructure along 6,600 miles

³⁷ Suzan, op cit..

³⁸ Zero-Emission Vehicle Market Development Strategy. California Government.

³⁹ Ibid.

⁴⁰ Johnson, P, BYD leads EV sales surge in Brazil with affordable electric cars, electrek, 4/5/24.

182.19 cont. of highways, with at least 4 fast chargers every 50 miles. CARB needs to be incentivizing the building of charging stations in other areas, e.g adding charging connections to local gas stations, creating charging hubs that include battery swaps and car sharing as well as charging, and adding charging stations to multi-family housing units.

182.20 Tesla's recently announced cutbacks in its supercharging program suggest that even the best, most reliable charging companies are not profitable, possibly ARB should increase LCFS capacity credits.

182.21 Most EVs are charged overnight at home. CARB might set up a system that would double or triple credits for EV fueling if sufficient solar with battery storage had been installed to charge household vehicles, with a further multiple for bidirectional charging systems. Households need more incentives to buy EVs and to install solar to charge them. This would also encourage apartment building owners to install chargers, though both building owner and tenant would need to share the credits. These credits could be allocated to individual residential buildings rather than to the utilities dispensing electricity. They could be sold on CARB's platform with households receiving annual or monthly payments.

182.22 ARB deserves substantial credit for jump-starting sales of ZEVs, but it now needs to assist California in accelerating its ZEV adoption rate the way the government of Norway did. The Governor's FY 2024-25 budget proposal to defer \$600 million for CARB's Low Carbon Transportation Programs (mostly ZEV programs) until FY 2027-28 has resulted in auto manufacturer discussions to scale back planned ZEV production. LCFS funds could be made available for these programs or new ones as early as FY 2025-26. The Clean Vehicle Rebate Project should be reactivated and the Clean Cars 4 All program maintained. Phasing out credits for crop-based alternative fuels would enable this.

182.23 Adopting the 2030 target rather than the current 2035 target for stopping sales of new light-duty ICE vehicles could provide an additional 256 million tons of carbon emission reductions; and it would align with the state's 2045 carbon neutrality goal, as nearly all passenger vehicles on the road in 2045 would be ZEVs.⁴¹

US Climate Action Network's VECA platform, supported by over 100 environmental organizations, recommended the 2030 target.⁴²

2) Cap LCFS credits for crop-based biofuels at 2020 levels beginning in 2025.

⁴¹ Center for Biological Diversity, All-Electric Drive: How California's Climate Success Depends on Zero-Emission Vehicles, December 2020.

⁴² US Climate Action Network (USCAN), Vision for Equitable Climate Action, 2021-2022.

182.24

Capping credits at 2020 levels will have no effect on ethanol and biodiesel producers because ethanol sales have changed little and biodiesel sales have actually decreased since then. Only renewable diesel will be impacted. Since most of the increased renewable diesel capacity in the US is from old, recently converted fossil fuel refineries which would have been decommissioned had they not been converted to renewable diesel production, closing them would not be that burdensome for their oil company owners. As compensation, these companies will benefit from higher fossil diesel sales in the short run.

Capping can be easily implemented. When a credit pathway reaches its 2020 level it would no longer be eligible for more credits that year. Pathways originating after 2020 would only receive credits if they replaced a pathway that no longer received credits or was willing to forgo receiving credits. Corn oil is a crop-based fuel that should also be capped at 2020 levels.

An additional benefit to capping credits for crop-based biofuels at 2020 levels would be its influence on increasing LCFS credit prices. Oil refineries would need to buy more credits because they would receive fewer credits for renewable diesel.

This policy has been recommended by CARB's Environmental Justice Advisory Committee (EJAC) and a myriad of scientists and environmental organizations.⁴³

3) Phase out all LCFS crop-based biofuel credits as soon as possible.

This would reduce deforestation and land conversion pressure in the tropics by freeing up land for food production.

182.25

US biodiesel production capacity is expected to continue to decline as feedstocks switch to renewable diesel. Oxygenation requirements will prevent reduction in ethanol production to some extent, but removing incentives should encourage the search for less land-intensive options. Renewable diesel conversions of oil refineries in California have failed to reduce local greenhouse gas emissions and have even worsened air quality in some cases. These refineries need to be decommissioned.

It would give the world time to expand and improve the United Nations' REDD+ (Reducing Emissions from Deforestation and forest Degradation) program in developing countries, and establish effective carbon market incentives for protecting

⁴³ Environmental Justice Advisory Committee, Low Carbon Fuel Standard, 9/14/2023.

Michael Wara, et al. testimony to CARB Sept. 14, 2023

<https://ww2.arb.ca.gov/sites/default/files/barcu/board/books/2023/091423/ejacguestspeakerpres.pdf>.

Martin, J, op. cit.

O'Malley, J, Setting a Lipids cap under the California Low Carbon Fuel Standard, op. cit.

Suzan, op. cit.

Velez, V, [CARB Must Reform LCFS Program to Meet Climate Goals](#), Natural Resources Defense Council, 8/23/23.

182.25
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forests, wetlands and undisturbed grasslands. In addition, it would reduce pressure on food prices, declining aquifers and biodiversity.

Caps for crop-based fuels would decrease annually until they are phased out, possibly in a few years, but definitely no later than 2030. For example, in 2026 crop-based biofuel pathway credits could be capped at three quarters of their 2020 level, in 2027 at half their 2020 level and beginning in 2028 all crop-based biofuel pathways could be eliminated.

Germany, Netherlands and Spain have been lowering their credit caps for crop-based fuels for several years, and France and Denmark allow no credits for either palm- or soy-based diesel.⁴⁴

4) Cap LCFS credits for residues: used cooking oil (UCO)-, tallow- and distiller's corn oil-based diesel at 2021 levels immediately. Introduce a system to certify the origin of UCO feedstocks.

182.26

Because lipid inputs for biomass-based diesel, such as pure vegetable oils and residue oils and fats, are interchangeable for many uses, they all need to be capped to prevent food price increases and the conversion of natural land to agriculture. ARB's carbon intensity (CI) scores for UCO, tallow and distiller's corn oil are underestimated because they do not include indirect land use change (ILUC) effects.

UCO from commercial sources (restaurants and food processing companies) in both the US and EU is already being collected. Much household UCO is not collected, but to date efforts to increase collection in the EU and US have resulted in little success. In other countries UCO is often reused as cooking oil, making it difficult to determine if its collection for biofuel production is displacing some other use or not.⁴⁵

Sources of tallow are determined primarily by the production of meat so supplies are not affected by higher tallow prices. It appears that oleochemical producers in the US have been substituting palm-based fatty acids for tallow as tallow prices have risen, encouraging greater production of palm oil, which is the most unsustainable vegetable oil being produced today.

5) Exclude all crop-based fuels from receiving any LCFS credits for aviation or maritime fuel.

182.27

It is crucial that California follow Europe's lead to ensure that intrastate and national flights receive no credits for crop based fuels and that annual caps for UCO and tallow are in place to prevent fraud and ILUC effects.

6) Develop strategies to enable accelerating Advanced Clean Fleets targets.

⁴⁴ Foreign Agricultural Service, USDA, [Biofuel Mandates in the EU by Member State-2023](#), 7/2023.

⁴⁵ Kristiana, T et al, [An estimate of current collection and potential collection of used cooking oil from major Asian exporting countries](#), ICCT, February, 2022.

182.28

Design incentives for trucking companies to use their existing ICE trucks more intensively so purchases of new vehicles can be delayed and the expected life of existing vehicles will be reduced. This might make it possible to advance the target date for requiring all sales of new trucks to be electric.

Design a system to include rebates for the purchase of new medium- and heavy-duty electric trucks in the LCFS program, possibly by crediting them upfront for their electric fueling for several years.

7) Offer credits for off-grid renewable energy hubs that will provide community charging sites.

182.29

Work with the state's 25 Community Choice Aggregation Programs to see how they could expand their rebate and charging incentives as well as provide additional credits for new renewable energy projects. Richmond, under the Marin Clean Energy CCA, offers customers three plans, one is 100% renewable electricity and one is 100% local solar. Providing credits for other 100% local solar projects that are linked to community charging stations would be worthwhile.

Conclusion

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In summary, the deep uncertainty associated with ARB's CI scoring for all crop-based fuels and the large negative side-effects not factored into ARB's CI scoring call for capping immediately and then quickly eliminating all crop-based fuels from the LCFS program. This would free up \$2 billion a year for accelerating the state's transition to ZEVs. It is crucial that California correct its LCFS problems and adopt goals to accelerate the transition to electric vehicles because it effectively sets the standards for many other states as well.

Thank you for considering these comments.

Sincerely,



Janet Cox, CEO
Climate Action California



Daniel Chandler, Ph.D., Steering Committee
350 Humboldt

Appendix: Models for calculating CI of crop-based biofuels

A previous comment letter from 350 Humboldt 350 (dated 2/19/24) described in detail concerns about CARB's Global Trade Analysis Project (GTAP) and Agro-Ecological Zone (AEZ) model assumptions and data files. This discussion is repeated here.

Comparison of ARB's GTAP and EU's GLOBIOM estimates of ILUC

The GTAP model assumes greater productivity increases result from feedstock price increases, though historical data does not seem to support this assumption.⁴⁶ The GTAP model also assumes that consumers will buy fewer vegetable oils as prices rise in response to greater biofuel production.⁴⁷ Yet global consumption of vegetable oils has been increasing more rapidly than most food types making this an unreasonable assumption. The GLOBIOM model assumes people will maintain a caloric intake sufficient to live, the GTAP model does not.

Crushing more soybeans to produce soybean oil for biofuels also produces more of the co-product soybean meal which is used as animal feed. The GTAP model predicts that farmers will substitute this cheaper feed for other feeds, while the GLOBIOM model predicts that the lower price will encourage more livestock production and hence increase demand for complementary feeds such as cereals.⁴⁸ Global meat consumption has also been increasing more rapidly than most food items adding support to GLOBIOM's approach.

The two models categorize land differently. In the GTAP model there is a "cropland pasture" category that refers to pasture land that was previously cropland and is easily converted back to cropland with little loss of carbon.⁴⁹ The model relies on this category to account for most of the land conversion in the US and Brazil. The GLOBIOM model includes an "other natural land" category which refers to unmanaged natural land that has a lower carbon stock than forests but higher than the cropland pasture category of the GTAP model. This is the land category that absorbs much of the land conversion resulting from increased biofuel production in the GLOBIOM model. Certainly for Brazil which has accounted for over 50% of the growth in soybean production since 2008 the GLOBIOM model's description of land use change is more accurate.

⁴⁶ Malins, C, Understanding the indirect land use change Analysis for CORSIA, Cerulogy, 2019.

⁴⁷ Ibid.

⁴⁸ Ibid.

⁴⁹ Ibid.



May 10, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Rulemaking Regarding Amendments to LCFS

The Brazilian Sugarcane and Bioenergy Industry Association (UNICA) appreciates the opportunity to provide additional feedback on the proposed amendments to the Low Carbon Fuel Standard, set for a vote later this year and implementation in 2025. UNICA commends California policymakers for their leadership in innovating the transportation fuels sector and setting a market-driven example of how to decarbonize mobility markets. The ongoing debate over the future of the LCFS demonstrates the policy's adaptability to unpredictable market conditions and its resilience under varying economic scenarios. In this spirit, we affirm our steadfast commitment as a partner to California and as a supplier of low carbon fuels to an increasingly global market. Brazilian ethanol has been integral to the carbon reduction goals of the LCFS and will continue to be so for decades to come, as reflected in the staff's latest projections.

We are dedicated to assisting California and other regions that follow its lead, to diversify their energy portfolios, support high-quality jobs in low-CI fuel production and distribution, decarbonize challenging sectors, advance sustainable agriculture, and lower consumer costs in accessing these fuels. In 2011, California made a thoughtful decision to utilize biofuels, yet the progress that is being made year over year should be considered in CARB's modeling to further encourage these investments. Given that California's climate policy extends well beyond its geographic boundaries, it is now, perhaps more than ever, essential that CARB's technical evaluation of biofuels remains consistent and up-to-date, particularly for energy sources that provide modern scientific evidence to support their claims.

We continue to encourage reevaluation of Brazilian ethanol to ensure accurate CI scoring using the most current methodologies, and this process can coexist with robust certification schemes that validate that Brazilian producers are adherent to stringent economic, social, and environmental standards. A thorough review of the data will reinforce that Brazilian ethanol should persist in contributing to California's climate goals, not only in road transportation but also in sectors that are difficult to decarbonize, using multi-cropping corn and sugarcane-derived advanced fuels for sustainable aviation fuels (SAFs) and bio bunker for maritime use cases.

Recent CARB workshops have highlighted the significant opportunity to reduce emissions in the aviation sector, although supply constraints pose challenges in the short term. UNICA producers are strategically positioned to support this transition, along with the current demand, with major US airlines already recognizing Brazil as a reliable partner ready to export necessary feedstocks¹. Partnerships are already in place to supply US SAF producing facilities². Meeting this growing demand will require significant expansion of supply capacity, a current shortfall in the US.

According to recent data from Environmental Health and Engineering, today's bioethanol is capable of reducing GHG emissions by over 50% compared to gasoline and can provide more emissions reduction benefits with the most recent technologies and soil management practices³. For example, over a decade ago, CARB reported the average carbon intensity (CI) for bioethanol at 88 gCO₂eq/MJ. Through the first quarter of 2024, the average recorded CI for bioethanol decreased to 54.5 gCO₂eq/MJ, ranging from 72 gCO₂eq/MJ to 28.5 gCO₂eq/MJ. On average, this represents a 38% reduction in CI, even including overstatements in modeled indirect land use change emissions and the lack of recognition of improvement in agricultural practices and utilization of energy intensive byproducts which would further lower Brazilian ethanol's CI score (more detail in "Technical Inputs" below).

UNICA is fully committed to aligning with CARB's goals, which include increasing the stringency of the LCFS program, enhancing equity provisions, supporting disadvantaged communities, and elevating standards that drive continuous improvement in biofuels production processes. Specifically, we support more ambitious targets of reducing carbon intensity (CI) by 40-42% by 2030 and achieving accelerated reduction in emissions through 2045⁴. Ethanol has been a cornerstone of the LCFS for over a decade, playing a pivotal role in achieving the program's CI reduction goals, as substantiated by CARB's analyses and projections. With the state already surpassing its objectives, we urge CARB to continue endorsing the technology-neutral principles that have fostered substantial investment and a vibrant credit market. Ethanol consistently represents 14% of the credit market, and projections indicate stable demand through 2045, ensuring that its presence does not impede the development of other fuel types. Instead, the focus within the industry is adding another decarbonization solution towards emerging markets such as sustainable aviation fuel (SAF).

Ethanol is vital in enhancing both the equity impacts and the affordability of low-CI fuel access within the LCFS. It has significantly promoted investment in disadvantaged, low-income, and rural communities and has consistently lowered fuel costs for Californians using flex-fuel vehicles, translating into billions of dollars in savings. Ethanol, particularly in the form of E85, is priced \$1.50-\$2.00 per gallon lower than gasoline, offering significant savings over the lifespan of a vehicle, and an

¹<https://www.reuters.com/business/aerospace-defense/boeing-says-brazil-could-be-top-sustainable-aviation-fuel-player-2023-08-08/>

²<https://www.epa.gov/system/files/documents/2023-01/lanzajet-d-code-4-rfs-pathway-determination-letter-2023-01-12.pdf>

³ <https://ehein.com/news/corn-ethanol-emits-46-less-greenhouse-gases-than-gasoline/>

⁴<https://www.ajot.com/news/low-carbon-fuels-coalition-releases-icf-international-report-demonstrating-opportunities-for-california-to-accelerate-its-path-to-carbon-neutrality>

appealing economic options when gasoline prices spike. Additionally, the potential approval of a higher ethanol blend, up to 15%, could further enhance fuel affordability and reduce emissions and particulate matter. For instance, in Brazil, the 27% blend of ethanol on gasoline lowers retail prices for customers and is incentivized by the domestic tax structure. CARB estimates suggest that by 2045, fuel expenses across all vehicle classes could be up to 42% lower than in 2021, potentially saving Californians over \$20 billion annually in fuel costs.

Proposed Sustainability Criteria

183.1

We are generally supportive of the concept of sustainability criteria, as long as they are transparent, affordable and aligned with existing certification schemes, such as ISCC, Bonsucro and RSB. We are confident that Brazilian producers will meet established standards, however we are concerned that the proposed amendments might introduce new, expensive, and unnecessary compliance challenges for bioethanol producers through potential requirements that remain vague and undefined. These requirements risk diminishing the availability of credit-generating biofuels within the LCFS Program. We are concerned with CARB's plan to delegate the authority over ambiguous "certification systems," to unknown external parties. This approach could inadvertently, or otherwise, disqualify up to 60% of the current credit-generating fuels from the LCFS program, potentially increasing the demand for fossil fuels and consequently elevating GHG emissions and toxic air pollutants.

CARB's initial statement of reasons (ISOR) describes intent "to implement the 2022 Scoping Plan Update" by "reducing emissions by driving down fossil fuel demand in transportation, transitioning to zero emission technology wherever feasible, and increasing the supply of low-carbon alternative fuels as quickly as possible." The 2022 Scoping Plan calls for substantial increases in liquid biofuels between 2022 and 2030, with demand in 2045 still remaining higher than current levels. Bioethanol, which currently makes up half of the biofuel used in California, will need to remain a major fuel source if the increases called for in the Scoping Plan are to be achieved.⁵ The proposed sustainability requirements, however, could undermine this stated purpose by levying unnecessary and substantial compliance costs on certain biofuels, and risk excluding certain low carbon fuels altogether. The effect of which would be to reduce the volume of credit-generating biofuel available to displace fossil fuels in the California market. To enable a smooth transition to utilizing sustainability criteria and certification processes, LCFS should use worldwide renowned certification schemes such as Bonsucro, ISCC and RSB or others.

Land Use Change (LUC)

183.2

CARB has not presented substantial evidence that direct land use changes, which could be addressed through feedstock tracking based on these criteria, are occurring. In the case of multi-cropping corn, historical data over many years shows that rising demand for bioethanol has consistently been met with increased yields per acre rather than expanded corn acreage.

⁵ Based on 2022 gasoline-gallon-equivalent data available at LCFS Data Dashboard, Figure 10(a), <https://ww2.arb.ca.gov/resources/documents/lcfs-data-dashboard>

The proposed amendments also fail to unlock the full decarbonizing potential of LCFS, by failing to update several important CI-scoring criteria that recognize the technical improvements made in the production process by Brazilian mills (detailed in table below). These CI improvements in ethanol derived from sugarcane and multi-cropping of second crop corn, as well as for waste and residue based feedstocks such as 2G ethanol from bagasse are unique to Brazil, none of which are currently considered in CARB's CI calculators. As sugarcane ethanol is already considered an advanced biofuel, we encourage further evaluation of Brazilian corn, because of the multi-cropping potential and it uses renewable biomass as a source of energy in the production.

183.2 cont.

Today UNICA producers utilize only 1% of all Brazilian territory to produce ethanol. Increased productivity has continued to occur within existing productive land. Significant investment has occurred to optimize the circular economy within our production. Although we do not export some of the products, we do have, for instance, biogas which is generated from vinasse biodigestion, a residue from ethanol production, which yields biomethane that is used as a substitute for diesel in rural machinery. These could be considered in the calculator since it is part of our production process.

CARB already applies a highly conservative and overestimated penalty to the carbon intensity of bioethanol in the LCFS program, which disproportionately discourages the use of bioethanol compared to other fuels. CARB's current lifecycle analysis overestimates its impact, relying on data that has not been updated since between 2013 and 2015. This overestimation primarily stems from an exaggerated indirect land use change (ILUC) penalty. Contrary to the static nature of CARB's iLUC estimates, the science behind lifecycle emissions modeling has evolved considerably over the past decade. Improvements in both the models themselves and the data they use have led to more accurate iLUC modeling, which now shows a notable decrease in values, generally less than half of CARB's current figures. Still, there remain several contested ILUC factors specific to the cultivation of sugarcane and corn in Brazil. Practices such as conservation of riparian forests, recovery of pastures, the second crop corn harvest, among others are not included in the methodology for calculating the impact on land use used by CARB (GTAP-AEZ_EF) and therefore, causes the LUC modeling to penalize Brazilian producers.

Two priority updates to the ILUC modeling include recognition of multi-cropping and improvements in land use practices. It is long overdue to incorporate the positive impacts of multi-cropping in Brazil which enables the cultivation of corn in a second crop, after soy has been harvested. The development of corn ethanol production in Brazil's midwest was based upon that possibility and, because of that, did not require any additional land use besides that which was already produced by soy. In terms of sugarcane, the production has to be near the mill, on average 30/40 km distance. We utilize the same land for a long time, managing in a sustainable way, having rotation with other cultures to protect the soil and increase its potential.

The study carried out by Adami et al. (2012) using satellite image mapping found that in the last cycle of crop expansion 2005 around 94% of new sugarcane areas were planted on pastures and annual crops. Since the study was released, Brazilian law related to the expansion of agriculture for biofuel production purposes has

become more restricted (RenovaBio's criteria is an example of that)⁶. An even more recent scientific publication by Guarenghi et al. (2023) offers a refined estimation of direct LUC associated with sugarcane cultivation in Brazil, covering both the Center-South and North regions, spanning the past two decades (2000–2020). This study incorporates changes in management practices and refined assessments of land-use carbon stocks. Key highlights include: The study revealed that sugarcane expansion predominantly occurred in severely and moderately degraded pastureland; 98.4% of expansion was over existent agricultural areas (predominantly pasturelands). By refining the management practices and carbon stocks of pasture, sugarcane, and temporary crop classes, the emissions associated with land use change (LUC) for sugarcane during the last 20 years shifted from 2.2 TgCO₂.yr⁻¹ to a pattern of LUC emission removal at -9.82 TgCO₂.yr⁻¹.⁷ Furthermore, according to a Embrapa study, a Brazilian research institute for agriculture, the sugarcane sector could still increase production to almost 7% of the Brazilian territory reaching almost 70 million hectares without any deforestation (nowadays the sector has around 10-12 million hectares)⁸.

Third Party Certification

UNICA is proud of the strong standing its producing members hold among several international accrediting bodies. We are also encouraged that CARB staff recognized some of the more relevant bodies (e.g., RSB, ISCC, Bonsucro) in the workshop notes. Regarding international certifications, It is worth noting that Brazil accounts for 1.6 MM hectares (84.2%) of the 1.9 MM hectares of Bonsucro area in the world. Further, Brazil accounts for 96 MM tons (80%) of the world's 120 MM tons of sugarcane production certified by Bonsucro. In total, there are 89 mills in Brazil certified by Bonsucro while there are only 165 mills certified in total in the world, which means Brazilian ethanol producers hold the most Bonsucro certification in the world, at 54% of the total. Some of our members, especially the ones with focus in exporting, hold ISCC certification (International Sustainability & Carbon Certification), and they have already been accredited for (or are undergoing accreditation process for) ISCC Corsia, that certifies eligible fuels for the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). Regarding domestic certifications, of the 127 mills which are UNICA members, 121 have RenovaBio⁹ accreditation, which represents approximately 75% of ethanol production in Brazil, and those that do not hold an active accreditation have been deactivated for some time. Greener Ethanol Protocol¹⁰ is a valid standard for sugarcane plants and suppliers located in the State of São Paulo. Based on the 2023 data, there are 129 ethanol plants and 13 certified supplier associations participating in the Greener Ethanol Protocol. Lastly, all exporting UNICA members hold at least one of the ISCC or Bonsucro certifications.

UNICA members already fulfill certification requirements that are internationally recognized, such as EU RED and CORSIA. The Brazilian ethanol sector understands the pivotal role sustainability certifications play in ensuring a fair-trade system

⁶ <https://www.mdpi.com/2071-1050/4/4/574>

⁷ Guarenghi, M.M.; Garofalo, D.F.T.; Seabra, J.E.A.; Moreira, M.M.R.; Novaes, R.M.L.; Ramos, N.P.; Nogueira, S.F.; de Andrade, C.A. *Land Use Change Net Removals Associated with Sugarcane in Brazil*. *Land* 2023, 12, 584. <https://doi.org/10.3390/land12030584>

⁸ <https://www.embrapa.br/busca-de-publicacoes/-/publicacao/579169/zoneamento-agroecologico-da-cana-de-acucar-expandir-a-producao-preservar-a-vida-garantir-o-futuro#:~:text=Resumo%3A%20O%20objetivo%20gera%20do,de%20da%20C3%A7%C3%BAcar%20no%20territ%C3%B3rio%20brasileiro.>

⁹ <https://www.gov.br/mme/pt-br/assuntos/secretarias/petroleo-gas-natural-e-bicombustiveis/renovabio-1/renovabio-ingles>

¹⁰ <https://www.infraestruturameioambiente.sp.gov.br/etanolverde/>

183.1 cont.

combined with sustainable development. A binding certification for LCFS can have unintended consequences and potentially exclude valuable supply of low-CI feedstocks if the policy is not properly tailored to align with existing certification schemes. New certifications mean additional costs and process for the mills. The difficulty of obtaining accreditation by 2028 depends on various factors such as the complexity of the accreditation process, the costs, the readiness of the organization seeking accreditation, and any unknown or untested regulatory or compliance requirements involved. For these reasons, we would therefore encourage CARB to carefully consider established certification schemes and take steps to avoid duplication of efforts and or placing unnecessary burdens on companies. We encourage the CARB team to add detail and gather additional feedback before a final policy is set on the following criteria:

- No cultivation occurred on areas that serve the purpose of nature protection
Damage or deterioration of habitats is avoided
- Crops are grown on suitable soils and have good agricultural practices with respect to soil quality, soil contamination and soil erosion
- Fertilizer application does not contaminate the surface and groundwater
- Responsible plant protection practices (insect treatments)
- Responsible waste management practices

183.3

To better accommodate the local nuances that may vary across different countries, we encourage the amendments to consider treatment of local legislation preempting new certifications provided that certain sustainability criteria, such as those outlined above are met. Each region has its distinctive local production dynamics and legal nuances, and international certification schemes frequently overlook the complexities of Brazilian law, as well as those of other biofuel-producing countries. The intricacies of local environmental and labor regulations should be considered if they do not conflict with CARB's stated goals.

We encourage a regional approach to standards and certification. The Brazilian biofuels sector is extremely heterogeneous, thus productivity indicators vary greatly when comparing different producing regions of Brazil. Consequently, agricultural management in each region is vastly different, and efficiency in the use of inputs, harvesting, and planting practices differ. For example, according to CONAB (the Brazilian Supply Company, that analyzes supply and demand of agricultural products) the productivity in the Center-South region in the 2023/2024 season was, on average, 88.2 tons of sugarcane per hectare, while in the NE region the indicator recorded a value of 64.8 t/ha. Even within the Center-South, conditions are not homogeneous between states. In the case of Brazilian producers of corn ethanol, production is currently concentrated in the central-west region. Alternatively, UNICA advocates for greater flexibility in utilizing actual data for primary data within the Tier 1 approach. Actual data can undergo verification during audit processes, similar to the procedures followed in the EU RED certification audits.

Technical Inputs

To reiterate the technical input from our prior comments, we respectfully request that CARB staff update the factors/ inputs presented below in this rulemaking to reflect the latest data and scientific literature.

183.4

INPUT	ASK
Primary Farming	Update farming input values based on truly verified

183.4 cont.

Data	primary data
Farming Energy + Mechanized Harvesting	Update mechanization to a conservative 95% rate in all states of the Center- South region of Brazil
Straw Yield	Update straw yield to 140 kg (dry) per ton of sugarcane (fresh weighted), in line with recent literature
N2O from Applied N	Update values to 0.006 kg-N2O-N/kg N-fert applied according to Tier2 evidence.
N2O and CH4 from vinasse transportation	Eliminate emissions of N2O and CH4 from vinasse transportation
Credits for electricity surplus	Credits from electricity surplus must consider the marginal (natural gas, diesel) instead of average of the grid
Logistical Routes	Allow Brazilian mills to register different routes with different CIs
Regenerative Agriculture	Recognize climate-smart agriculture techniques for crop-based biofuels, including in Brazil
By Products Optimization	Establish credit values for displacement of natural gas by biomethane

We appreciate the opportunity to submit this feedback and we look forward to discussing with CARB staff the importance of striking balance with these proposed amendments. Significant improvements have been made in the ethanol production process influenced by CARB's policy guidance and incentives, and we are committed to continuing those efforts across our membership. While we understand the motivation behind the sustainability criteria, including third party accreditation, a time threshold on producing land, and tracking biofuel production to its source, we encourage the close consideration of unintended consequences if the policy does not take into account local context and existing validation of production that yields significant economic, social, or environmental benefits.

Thank you for your consideration.

Sincerely,
Austin Heyworth
UNICA, North American Representative

Comments of Conventional Jet Fuel Obligation - Proposed Amendments to the Low Carbon Fuel Standard

Dear California Air Resources Board,

We appreciate the opportunity to provide comments following the California Air Resources Board's (CARB) public workshop on April 10, 2024, regarding the proposed amendments to the Low Carbon Fuel Standard (LCFS).

We have been actively engaged in researching how to promote aviation decarbonization in California, focusing on both technical feasibility and policy implications. Sustainable aviation fuel (SAF) or alternative jet fuel is one of our main areas of focus. In our analysis, we measured the potential impact of jet fuel prices on aviation demand if the LCFS mandates intrastate conventional jet fuel.

184.1

Aviation demand (D) can be modeled as a function of the state's gross domestic product (GDP) and either jet fuel prices (P) or airfare (Airfare):

$$\ln D = \beta_0 + \beta_1 \cdot \ln GDP + \beta_2 \cdot \ln P + \varepsilon$$

$$\ln D = \theta_0 + \theta_1 \cdot \ln GDP + \theta_2 \cdot \ln Airfare + \varepsilon$$

Where, airfare can be expressed by a function of jet fuel prices (P):

$$\ln Airfare = \alpha_0 + \alpha_1 \cdot \ln P + \varepsilon$$

Therefore, the elasticity of air transport demand with respect to jet fuel prices (β_2) is equal to the elasticity of air transport demand with respect to airfare (θ_2), multiplied by the elasticity of airfare with respect to jet fuel prices (α_1):

$$\frac{\partial \ln D}{\partial \ln P} = \frac{\partial \ln D}{\partial \ln Airfare} \cdot \frac{\partial \ln Airfare}{\partial \ln P}$$

$$(\beta_2 = \theta_2 \cdot \alpha_1)$$

Thus, by measuring the elasticity of aviation demand with respect to airfare and the elasticity of airfare with respect to jet fuel prices, we can measure the impact of jet fuel prices on aviation demand.

Our analysis used total passengers as the metric for aviation demand and the passenger-weighted average airfare as the metric for airfare. To model California's aviation demand for both intrastate and domestic flights, we gathered quarterly data on demand and airfare from the Bureau of Transportation Statistics, as well as GDP data from the US Bureau of Economic Analysis from 2000 to 2019. Additionally, we collected jet fuel price data from the Energy Information Agency (EIA) to establish the relationship between airfare and jet fuel prices. By

leveraging these datasets, we were able to measure the elasticity of aviation demand with respect to airfare and the elasticity of airfare with respect to jet fuel prices.

The jet fuel price forecast is \$16.44 per million Btu (\$723.5/Ton) for 2030 and \$17.77 per million Btu (\$779/Ton) for 2035, based on EIA forecasts. Credit price is based on Appendix C-1: Standardized Regulatory Impact Assessment in the proposed LCFS Standard Amendments where the credit price is \$76/MT credits in 2030 while \$138/MT credits in 2035. Based on the adjusted carbon intensity in Appendix C, the jet fuel adjusted CI is 89.43 g CO₂e/MJ. Thus, the deficits for intrastate jet fuel used is \$0.15/gallon (\$48/Ton) in 2030, and \$0.68/gallon (\$222.5/Ton) in 2035.

Three scenarios were evaluated: the baseline scenario, consistent with the existing design of the LCFS without eliminating the jet fuel exemption from fossil jet fuels; the proposed scenario, based on proposed amendments to the LCFS with the elimination of the jet fuel exemption from intrastate fossil jet fuels; and the enhanced scenario, considering the elimination of the jet fuel exemption from domestic fossil jet fuels (both intrastate and interstate).

Under these scenarios, two assumptions for price impacts on flight types were considered: assuming the price impact will affect domestic flights, not just intrastate flights, with an elasticity of air transport demand with respect to jet fuel prices (β_2) of -0.0625; assuming the price impact specifically targets intrastate flights, with an elasticity of air transport demand with respect to jet fuel prices (β_2) of -0.1154.

The following tables show the changes in the jet fuel price, the percentage change in jet fuel price, and the corresponding impact on intrastate demand (or domestic demand).

Table 1. Jet Fuel Price Impacts on Domestic Aviation Demand Change

Scenario		Jet Fuel Price (\$/Ton)	Jet Fuel Price Change (%)	Domestic Aviation Demand Change (%)
2030	Baseline	723.5	-	-
	Proposed	727.8	+0.6%	-0.04%
	Enhanced	771.5	+6.6%	-0.4%
2035	Baseline	779	-	-
	Proposed	799	+2.6%	-0.2%
	Enhanced	1001.5	+29%	-1.8%

184.1 cont.

Table 2. Jet Fuel Price Impacts on Intrastate Aviation Demand Change

Scenario		Jet Fuel Price (\$/Ton)	Jet Fuel Price Change (%)	Intrastate Aviation Demand Change (%)
2030	Baseline	723.5	-	-
	Proposed	771.5	+6.6%	-0.8%
2035	Baseline	779	-	-
	Proposed	1001.5	+29%	-3.3%

* where under enhanced scenario, the jet fuel price impact on domestic aviation demand is the same as shown in Table 1.

Based on the tables above, our main observations are as follows: When considering the impact on domestic flights, the proposed scenario leads to minor changes, with reductions of -0.04% in 2030 and -0.2% in 2035. However, if price impact specifically targets intrastate flights, the impact becomes more significant. Under the proposed scenario, reductions will be -0.8% in 2030 and -3.3% in 2035.

Sincerely,

Professor Mark Hansen

Department of Civil and Environmental Engineering, UC Berkeley

Co-Director, National Center of Excellence for Aviation Operations Research

Yati Liu, Ph.D. Student

Department of Civil and Environmental Engineering, UC Berkeley

184.1 cont.



May 10, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95815

Re: Comments of Voltera on the Proposed Low Carbon Fuel Standard Amendments

California Air Resources Board Members and Staff,

Voltera appreciates the opportunity to provide these comments to the California Air Resources Board (CARB), in response to the proposed Low Carbon Fuel Standard (LCFS) Amendments, and April 10, 2024 workshop. Through this filing, we reinforce our February 20th, 2024 recommendations, share alignment of our comments with other stakeholders, and provide further feedback on critical, recommended approaches to strengthen the LCFS regulation in support of widespread electric vehicle (EV) adoption.

Introduction

Executive Summary

There are multiple, significant opportunities for CARB to strengthen the overall efficacy of the LCFS program.

For the medium and heavy-duty (M/HD) sector, there are clear opportunities for CARB to adjust the LCFS regulation to align with M/HD ZEV infrastructure deployment needs and realities. Voltera recommends that CARB remove the proposed geographic limitations which restrict investments to within 1 mile of a Federal Highway Administration Alternative Fuel Corridor, remove the proposed 10 FSE per-site cap, reduce or clarify the proposed 250kW minimum capacity for FSE, clarify the 1/4 mile factor and eliminate the per site 10 MW limit, and increase the MHD-FCI program deficit to 5%, to help California meet state M/HD deployment goals.

For the light-duty (LD) sector, there are also clear opportunities for CARB to adjust the LCFS regulation to better support LD fleet electrification, especially with respect to EV infrastructure for shared mobility. In this regard, Voltera encourages CARB to create a LD FCI provision for entities that are deploying infrastructure to support EV ridesharing, EV rental, and EV carsharing. To support market confidence in LD infrastructure investments, Voltera further recommends that CARB maintain the 2.5% cap (in contrary to the staff proposed reduction to 0.5%) for the 2026—2030 timeframe.

With these critical adjustments, Voltera is confident that the LCFS program will continue to deliver key support to the ZEV transition to help enable stakeholders to achieve the goals and comply with the mandates of the Clean Cars II, Clean Miles Standard, Innovative Clean Transit, Advanced Clean Trucks and Advanced Clean Fleets regulations.

Coalition Engagement

Voltera's comments are informed and have been developed through a diverse array of meetings and discussion with industry stakeholders and coalition partners. These engagements have included coordination and co-development of comments with an assorted array of partners, including the California Electric Transportation Coalition (CalETC), Powering America's Commercial Transportation (PACT), and the Joint MHD EV Infrastructure Parties. While the comments developed within this document are Voltera's distinct position, many of our recommendations align with those expressed by these stakeholders, and relatedly, Voltera has directly signed on in support of the comments filed by the Joint MHD EV Infrastructure Parties.

About Voltera

Voltera sites, invests in, builds, and operates strategically located, fit-for-purpose charging facilities enabling our customers to deploy and operate EVs at scale.

Voltera provides a charging infrastructure as a service (CaaS) model. CaaS is a turnkey solution that includes site identification and acquisition, site development, hardware deployment, operations, and maintenance. Voltera coordinates the entire real estate process for (and often with) customers and develops the site on their behalf. Voltera procures and installs electric vehicle supply equipment (EVSE) hardware and operates and maintains the site, including the EVSE. Reliability, availability, and speed of charging are typically guaranteed through service-level agreements that Voltera holds with our customers. In February 2024, Voltera announced that we have secured 19 ZEV infrastructure development sites since August 2022, bringing Voltera's portfolio to 21 sites, representing approximately \$150 million of private investment in ZEV infrastructure real estate and over 115 megawatts (MW) of planned charging capacity, with projects across California, Arizona, Texas, Georgia, and Florida.¹

Voltera's current initiatives in California include:

- Goods movement: Voltera has opened its first scaled truck site with 65 installed high-powered DC fast chargers (DCFC) in Lynwood. In addition, Voltera has purchased properties throughout California and is positioned to rapidly accelerate medium and heavy-duty (M/HD) goods movement with the aid of an evolved and sustainable LCFS

¹ Reference: Voltera Solutions, EV Charging and Infrastructure Services. Website Access: <https://www.volterapower.com/solutions>

program. Voltera recently announced planned development of a truck site in Wilmington with support from the Federal Highway Administration and the South Coast Air Quality Management District.²

- People movement: Voltera has purchased and is developing multiple properties in California to support light-duty (LD) rideshare electrification, including in the San Francisco and Los Angeles regions.
- Regulatory: Voltera is actively engaged in multiple regulatory proceedings. We are a party to Rulemaking 23-12-008, Order Instituting Rulemaking Regarding Transportation Electrification (TE) Policy and Infrastructure, before the California Public Utility Commission (CPUC). Rulemaking 23-12-008 is intended to address future utility TE programs and is especially pertinent to these comments based on the potential overlap with LCFS resources. Notably, utilities are responsible with implementing LCFS holdback credit programs which are the dual jurisdiction of CARB and the CPUC. Voltera is also engaged as a party in Rulemaking 24-01-018, the Order Instituting Rulemaking to Establish Energization Timelines. Voltera intends on engaging at the CPUC to support continued policy development on ZEV issues, including LCFS strategy recommendations.

Based on the extensive industry experience of Voltera's team, we provide the following comments. Our recommendations are intended to ensure that the LCFS regulation is structured in a manner that is flexible enough to support both the market and technology innovations needed to achieve the diverse goals established across the LD and M/HD sectors in California. An evolved and sustainable LCFS program is all the more critical in light of recent budget direction that could diminish infrastructure funding via a number of essential programs.

Comments

LD Sector Recommendations

- a. There is clear opportunity to adjust the LCFS regulation to better support LD fleet electrification, particularly that supporting shared mobility

It is important that CARB ensures alignment between the LCFS program and the sectors that are mandated to electrify, including the LD sector. For example, transportation network companies (TNCs) are compelled to electrify consistent with achieving 100% electric vehicle miles traveled (eVMT) by 2030 under the Clean Miles Standard.³ CARB can ensure that the LCFS program aligns its support with the LD sector by making the following key program adjustments.

² Website Access: <https://www.volterapower.com/post/voltera-secures-9-6m-federal-grant-to-electrify-major-us-ports-savannah-los-angeles-and-long-beach>

³ Website Access: <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2021/cleanmilesstandard/fsor.pdf>

- b. Create a LD Fast-Charging Infrastructure (FCI) provision for private companies that are deploying infrastructure to support EV ridesharing, EV rental, and EV carsharing

185.6 Reinforcing our prior comments, Voltera recommends that CARB adjust the existing LD FCI provision to allow for FCI incentives to be applicable anywhere (and not just for public access), especially in scenarios where infrastructure is specifically built by the private sector and designated to promote infrastructure access for EV ridesharing, EV rentals, or EV carsharing. Through this adjustment, CARB can embolden stakeholders to more aggressively achieve technological and economically feasible solutions for shared electrification across the TNC, taxi, rental, and carsharing sectors. This adjustment would be especially valuable to accelerate electrification of the vehicles leveraging the TNC platforms, which as noted earlier must meet 100% eVMT by 2030 under the Clean Miles Standard. In addition, this adjustment would directly align with multiple policies, as California has prioritized electric car rentals and sharing as detailed in the 2013 ZEV Action Plan⁴ and EV sharing policies in the 2015 ZEV Action Plan.⁵ Relatedly, the CPUC has taken up the Clean Miles Standard rulemaking, which this adjustment would directly support.⁶ As such, Voltera recommends that CARB structure support for the continued and accelerated electrification of the EV ridesharing, EV rental, and EV carsharing sectors by supporting the growth of its attendant EV infrastructure.

- c. Maintaining the 2.5% cap for LD

185.7 As detailed in our previous comments, Voltera's recommends that the current 2.5% cap continue (in contrast to the staff proposal to reduce to 0.5%, from 2026-2030. Maintaining the provision better aligns with CARB's Scoping Plan, the Advanced Clean Cars II regulation, as well as the AB 2127 report by the California Energy Commission.

M/HD Sector Recommendations

There is significant, clear opportunity for CARB to adjust the LCFS regulation to better align with M/HD ZEV infrastructure deployment needs and realities.

185.8 Voltera applauds CARB's leadership in the development of the proposed M/HD FCI program provisions. With necessary modifications, CARB's proposed M/HD FCI program can be highly effective in attracting private capital to build essential infrastructure. Specifically, there is need to better align the provision with the on-the-ground realities of deploying M/HD infrastructure to improve program efficacy. In this regard, reinforcing our previous comments and aligning

⁴ Website Access: [https://opr.ca.gov/docs/Governors_Office_ZEV_Action_Plan_\(02-13\).pdf](https://opr.ca.gov/docs/Governors_Office_ZEV_Action_Plan_(02-13).pdf)

⁵ Website Access: https://www.ca.gov/archive/gov39/wp-content/uploads/2018/01/DRAFT_2015_ZEV_Action_Plan_042415.pdf

⁶ Website Access: <https://www.cpuc.ca.gov/news-and-updates/all-news/cpuc-sets-path-for-transportation-companies-to-electrify-fleets-2024>

additional commenters, Voltera strongly recommends the following adjustments to the M/HD FCI program.

d. Remove the 1-mile geographic limitation

185.9

Voltera recommends that CARB remove geographic limitations to the M/HD FCI program. Such adjustment will improve the program's effectiveness to support the M/HD industry and will better align with specific fleet and infrastructure demands and realities. As noted in our February 20th comments, we are concerned that the proposed requirement limits the M/HD FCI program to one mile of a ready or pending Federal Highway Administration Alternative Fuel Corridor. This will only exacerbate existing land acquisition challenges. Relatedly, many parties have further recommended this change, and Voltera aligns our recommendation with multiple parties who have also expressed the challenges posed by geographic restrictions. Coalition for Clean Air notes that geographic restrictions should be removed, as they will undercut program effectiveness, delay deployment, and increase costs for charging and grid upgrades.⁷ Natural Resources Defense Council (NRDC) comments that CARB should allow M/HD FCI locations anywhere in California—especially for shared depots, or within 5 miles from a corridor rather than just 1 mile.⁸ Earthjustice further commented that geographic restrictions will add administrative burden and unnecessarily exclude sites with high potential to electrify earlier than longer haul routes that would be operating along these corridors.⁹

Moreover, the proposed M/HD FCI provision is misaligned with the on-the ground experiences of energizing large-scale M/HD projects. These energization timelines are of such high importance that the CPUC (per SB 410) has taken up Rulemaking 24-01-018. In this regard, the utility response to the LCFS rulemaking provide key perspective. Southern California Edison notes that CARB should reject the 1-mile corridor requirement due to grid constraints and resulting delays and cost increases, and other negative externalities that impact deployment.¹⁰ Sacramento Municipal Utility District further recommends that CARB consider making the boundary more flexible, as “such a restriction for MHD EV infrastructure would significantly limit the number of locations where these investments could be made, and investments may be needed in areas that do not overlap with equity communities.”¹¹

e. Eliminate the 10 FSE per-site cap

185.10

It is imperative to stress that the M/HD sector transition is still in its nascency particularly in relation to operational deployment. As such, flexible terms that encourage market and technology innovation are warranted. Voltera recommends that CARB remove the 10 FSE per-

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⁹ Comments of Earthjustice on LCFS, Website Access: 6958-lcfs2024-WzUFcVA1BTUAWQNg.pdf (ca.gov)

¹⁰ Comments of Southern California Edison, Website Access:

¹¹ Sacramento Municipal Utility District, LCFS Comments, Website Access: 6201 HQ Letterhead (ca.gov).

185.10
cont. site cap. Removing this cap will help enable project stakeholders to scale infrastructure in the manner necessary to meet the state's M/HD goals and will likely encourage stakeholders to engage in cost reductions from economies of scale that come with investments in larger projects. Multiple stakeholders, including the Joint MHD EV Infrastructure Parties (with whom Voltera is aligned) recommend striking Section §95486.3(b)(2)(D), which establishes a limit of 10 eligible FSEs per application within a quarter mile. Nonetheless, if CARB feels that there are strong reasons not to eliminate the FSE cap, Voltera would encourage CARB to consider a higher step-down cap, for example to 30 FSE credits per site, and a potential tiering of further site FSE credits to partial credit value to support additional infrastructure deployments. This is critical to support the transition of larger fleets.

f. Eliminate or reduce the 250kW minimum capacity

185.11 It is imperative that CARB establish a M/HD FCI provision that recognizes fleet diversity and best aligns with the current state (and early stages) of operational planning while also envisioning future need. Eliminating the 250kW minimum capacity will help enable infrastructure providers to deliver a variety of solutions to meet market needs, and closely aligns with state policies to promote transportation electrification projects that minimize costs while maximize benefits. Specifically, Voltera encourages CARB to enable infrastructure developers to provide a variety of solutions to meet market needs, which may or may not meet the proposed 250kW threshold. This recommendation is aligned with NRDC, which agrees that sites should be able to have a mix of charging levels to meet different customer needs.¹² Environmental Defense Fund also suggests removing the minimum.¹³

g. Clarify the 1/4 mile factor and eliminate the per site 10 MW limit

185.12 CARB proposes that: "The total nameplate power rating for all FSEs claiming MHD-FCI credit owned by a single applicant within 1/4 mile of an MHD-FCI site cannot exceed 10 MW." Voltera reads this as there being a 1/4 radius component to the number of proposed FSE MHD FCI credits that can be claimed by a single entity. However, this language reading could also result in linking this not to a single entity, but to multiple entities. From Voltera's perspective, this latter scenario is a direct concern, and in any logical scenario, Voltera recommends removal of the 10MW combined nameplate threshold altogether. This approach will help motivate investment in megawatt-level chargers.

185.13 h. Increase the MHD-FCI program deficit to 5% to help California meet state M/HD deployment goals

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¹³Comments of Environmental Defense Fund, Website Access: 7011-lcfs2024-BWBWNFE2BwsGYwdo.pdf (ca.gov)

185.13
cont.

The current proposal for the MHD-FCI program is limited to 2.5% of the previous quarter's deficits. However, Voltera stresses the nascency of the M/HD market segment and encourages CARB to raise this cap to attract the private investment needed to accelerate and scale the M/HD ZEV market and meet relevant regulations. As identified in the CEC's AB 2127 analysis, the state will need approximately 2,900 MW of charging capacity by 2025 and 11,600 MW of capacity by 2030.¹⁴ This implies continuous and accelerated deployment needed to meet our long-term objectives. for example, the California Trucking Association estimates that 300-600 DC fast chargers need to be installed every week to meet the state's 2035 needs.¹⁵ As such, Voltera encourages CARB to raise the proposed cap to 5% to help meet M/HD infrastructure demands, to bolster market support for these investments and accelerate market deployment.

Conclusion

Voltera appreciates the opportunity to provide these comments to CARB in response to the proposed LCFS amendments, and the associated April 10, 2024 workshop. Please reach out with any questions or for clarification regarding these comments.

Respectfully submitted,



Paul D. Hernandez

Sr. Policy Manager, Government and Utility Relations
Voltera
phernandez@volterapower.com

¹⁴ The California Energy Commission's AB 2127 report uses the HEVI-load model to forecast the number of depot and public chargers required for MHD charging under the AATE3 primary scenario. This forecast predicts the number of chargers and their respective power ratings that will be required in 2025 and 2030, as seen in Appendix-H, Table H-1. The sum of the total MHD charging capacity based on this forecast was calculated to be 2,900 MW and 11,600 MW by 2025 and 2030, respectively, by taking the sum-product of the number of chargers and their respective power rating.

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May 10, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95815

Re: Comments of Voltera on the Proposed Low Carbon Fuel Standard Amendments

California Air Resources Board Members and Staff,

Voltera appreciates the opportunity to provide these comments to the California Air Resources Board (CARB), in response to the proposed Low Carbon Fuel Standard (LCFS) Amendments, and April 10, 2024 workshop. Through this filing, we reinforce our February 20th, 2024 recommendations, share alignment of our comments with other stakeholders, and provide further feedback on critical, recommended approaches to strengthen the LCFS regulation in support of widespread electric vehicle (EV) adoption.

Introduction

Executive Summary

There are multiple, significant opportunities for CARB to strengthen the overall efficacy of the LCFS program.

For the medium and heavy-duty (M/HD) sector, there are clear opportunities for CARB to adjust the LCFS regulation to align with M/HD ZEV infrastructure deployment needs and realities. Voltera recommends that CARB remove the proposed geographic limitations which restrict investments to within 1 mile of a Federal Highway Administration Alternative Fuel Corridor, remove the proposed 10 FSE per-site cap, reduce or clarify the proposed 250kW minimum capacity for FSE, clarify the 1/4 mile factor and eliminate the per site 10 MW limit, and increase the MHD-FCI program deficit to 5%, to help California meet state M/HD deployment goals.

For the light-duty (LD) sector, there are also clear opportunities for CARB to adjust the LCFS regulation to better support LD fleet electrification, especially with respect to EV infrastructure for shared mobility. In this regard, Voltera encourages CARB to create a LD FCI provision for entities that are deploying infrastructure to support EV ridesharing, EV rental, and EV carsharing. To support market confidence in LD infrastructure investments, Voltera further recommends that CARB maintain the 2.5% cap (in contrary to the staff proposed reduction to 0.5%) for the 2026—2030 timeframe.

With these critical adjustments, Voltera is confident that the LCFS program will continue to deliver key support to the ZEV transition to help enable stakeholders to achieve the goals and comply with the mandates of the Clean Cars II, Clean Miles Standard, Innovative Clean Transit, Advanced Clean Trucks and Advanced Clean Fleets regulations.

Coalition Engagement

Voltera's comments are informed and have been developed through a diverse array of meetings and discussion with industry stakeholders and coalition partners. These engagements have included coordination and co-development of comments with an assorted array of partners, including the California Electric Transportation Coalition (CalETC), Powering America's Commercial Transportation (PACT), and the Joint MHD EV Infrastructure Parties. While the comments developed within this document are Voltera's distinct position, many of our recommendations align with those expressed by these stakeholders, and relatedly, Voltera has directly signed on in support of the comments filed by the Joint MHD EV Infrastructure Parties.

About Voltera

Voltera sites, invests in, builds, and operates strategically located, fit-for-purpose charging facilities enabling our customers to deploy and operate EVs at scale.

Voltera provides a charging infrastructure as a service (CaaS) model. CaaS is a turnkey solution that includes site identification and acquisition, site development, hardware deployment, operations, and maintenance. Voltera coordinates the entire real estate process for (and often with) customers and develops the site on their behalf. Voltera procures and installs electric vehicle supply equipment (EVSE) hardware and operates and maintains the site, including the EVSE. Reliability, availability, and speed of charging are typically guaranteed through service-level agreements that Voltera holds with our customers. In February 2024, Voltera announced that we have secured 19 ZEV infrastructure development sites since August 2022, bringing Voltera's portfolio to 21 sites, representing approximately \$150 million of private investment in ZEV infrastructure real estate and over 115 megawatts (MW) of planned charging capacity, with projects across California, Arizona, Texas, Georgia, and Florida.¹

Voltera's current initiatives in California include:

- Goods movement: Voltera has opened its first scaled truck site with 65 installed high-powered DC fast chargers (DCFC) in Lynwood. In addition, Voltera has purchased properties throughout California and is positioned to rapidly accelerate medium and heavy-duty (M/HD) goods movement with the aid of an evolved and sustainable LCFS

¹ Reference: Voltera Solutions, EV Charging and Infrastructure Services. Website Access: <https://www.volterapower.com/solutions>

program. Voltera recently announced planned development of a truck site in Wilmington with support from the Federal Highway Administration and the South Coast Air Quality Management District.²

- People movement: Voltera has purchased and is developing multiple properties in California to support light-duty (LD) rideshare electrification, including in the San Francisco and Los Angeles regions.
- Regulatory: Voltera is actively engaged in multiple regulatory proceedings. We are a party to Rulemaking 23-12-008, Order Instituting Rulemaking Regarding Transportation Electrification (TE) Policy and Infrastructure, before the California Public Utility Commission (CPUC). Rulemaking 23-12-008 is intended to address future utility TE programs and is especially pertinent to these comments based on the potential overlap with LCFS resources. Notably, utilities are responsible with implementing LCFS holdback credit programs which are the dual jurisdiction of CARB and the CPUC. Voltera is also engaged as a party in Rulemaking 24-01-018, the Order Instituting Rulemaking to Establish Energization Timelines. Voltera intends on engaging at the CPUC to support continued policy development on ZEV issues, including LCFS strategy recommendations.

Based on the extensive industry experience of Voltera's team, we provide the following comments. Our recommendations are intended to ensure that the LCFS regulation is structured in a manner that is flexible enough to support both the market and technology innovations needed to achieve the diverse goals established across the LD and M/HD sectors in California. An evolved and sustainable LCFS program is all the more critical in light of recent budget direction that could diminish infrastructure funding via a number of essential programs.

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It is important that CARB ensures alignment between the LCFS program and the sectors that are mandated to electrify, including the LD sector. For example, transportation network companies (TNCs) are compelled to electrify consistent with achieving 100% electric vehicle miles traveled (eVMT) by 2030 under the Clean Miles Standard.³ CARB can ensure that the LCFS program aligns its support with the LD sector by making the following key program adjustments.

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Reinforcing our prior comments, Voltera recommends that CARB adjust the existing LD FCI provision to allow for FCI incentives to be applicable anywhere (and not just for public access), especially in scenarios where infrastructure is specifically built by the private sector and designated to promote infrastructure access for EV ridesharing, EV rentals, or EV carsharing. Through this adjustment, CARB can embolden stakeholders to more aggressively achieve technological and economically feasible solutions for shared electrification across the TNC, taxi, rental, and carsharing sectors. This adjustment would be especially valuable to accelerate electrification of the vehicles leveraging the TNC platforms, which as noted earlier must meet 100% eVMT by 2030 under the Clean Miles Standard. In addition, this adjustment would directly align with multiple policies, as California has prioritized electric car rentals and sharing as detailed in the 2013 ZEV Action Plan⁴ and EV sharing policies in the 2015 ZEV Action Plan.⁵ Relatedly, the CPUC has taken up the Clean Miles Standard rulemaking, which this adjustment would directly support.⁶ As such, Voltera recommends that CARB structure support for the continued and accelerated electrification of the EV ridesharing, EV rental, and EV carsharing sectors by supporting the growth of its attendant EV infrastructure.

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As detailed in our previous comments, Voltera's recommends that the current 2.5% cap continue (in contrast to the staff proposal to reduce to 0.5%, from 2026-2030. Maintaining the provision better aligns with CARB's Scoping Plan, the Advanced Clean Cars II regulation, as well as the AB 2127 report by the California Energy Commission.

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There is significant, clear opportunity for CARB to adjust the LCFS regulation to better align with M/HD ZEV infrastructure deployment needs and realities.

Voltera applauds CARB's leadership in the development of the proposed M/HD FCI program provisions. With necessary modifications, CARB's proposed M/HD FCI program can be highly effective in attracting private capital to build essential infrastructure. Specifically, there is need to better align the provision with the on-the-ground realities of deploying M/HD infrastructure to improve program efficacy. In this regard, reinforcing our previous comments and aligning

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additional commenters, Voltera strongly recommends the following adjustments to the M/HD FCI program.

d. Remove the 1-mile geographic limitation

Voltera recommends that CARB remove geographic limitations to the M/HD FCI program. Such adjustment will improve the program's effectiveness to support the M/HD industry and will better align with specific fleet and infrastructure demands and realities. As noted in our February 20th comments, we are concerned that the proposed requirement limits the M/HD FCI program to one mile of a ready or pending Federal Highway Administration Alternative Fuel Corridor. This will only exacerbate existing land acquisition challenges. Relatedly, many parties have further recommended this change, and Voltera aligns our recommendation with multiple parties who have also expressed the challenges posed by geographic restrictions. Coalition for Clean Air notes that geographic restrictions should be removed, as they will undercut program effectiveness, delay deployment, and increase costs for charging and grid upgrades.⁷ Natural Resources Defense Council (NRDC) comments that CARB should allow M/HD FCI locations anywhere in California—especially for shared depots, or within 5 miles from a corridor rather than just 1 mile.⁸ Earthjustice further commented that geographic restrictions will add administrative burden and unnecessarily exclude sites with high potential to electrify earlier than longer haul routes that would be operating along these corridors.⁹

Moreover, the proposed M/HD FCI provision is misaligned with the on-the ground experiences of energizing large-scale M/HD projects. These energization timelines are of such high importance that the CPUC (per SB 410) has taken up Rulemaking 24-01-018. In this regard, the utility response to the LCFS rulemaking provide key perspective. Southern California Edison notes that CARB should reject the 1-mile corridor requirement due to grid constraints and resulting delays and cost increases, and other negative externalities that impact deployment.¹⁰ Sacramento Municipal Utility District further recommends that CARB consider making the boundary more flexible, as “such a restriction for MHD EV infrastructure would significantly limit the number of locations where these investments could be made, and investments may be needed in areas that do not overlap with equity communities.”¹¹

e. Eliminate the 10 FSE per-site cap

It is imperative to stress that the M/HD sector transition is still in its nascency particularly in relation to operational deployment. As such, flexible terms that encourage market and technology innovation are warranted. Voltera recommends that CARB remove the 10 FSE per-

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The current proposal for the MHD-FCI program is limited to 2.5% of the previous quarter's deficits. However, Voltera stresses the nascency of the M/HD market segment and encourages CARB to raise this cap to attract the private investment needed to accelerate and scale the M/HD ZEV market and meet relevant regulations. As identified in the CEC's AB 2127 analysis, the state will need approximately 2,900 MW of charging capacity by 2025 and 11,600 MW of capacity by 2030.¹⁴ This implies continuous and accelerated deployment needed to meet our long-term objectives. for example, the California Trucking Association estimates that 300-600 DC fast chargers need to be installed every week to meet the state's 2035 needs.¹⁵ As such, Voltera encourages CARB to raise the proposed cap to 5% to help meet M/HD infrastructure demands, to bolster market support for these investments and accelerate market deployment.

Conclusion

Voltera appreciates the opportunity to provide these comments to CARB in response to the proposed LCFS amendments, and the associated April 10, 2024 workshop. Please reach out with any questions or for clarification regarding these comments.

Respectfully submitted,



Paul D. Hernandez

Sr. Policy Manager, Government and Utility Relations
Voltera
phernandez@volterapower.com

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American Honda Motor Co., Inc.
1919 Torrance Boulevard
Torrance, CA 90501-2746
Phone (310) 783-2000

Ms. Rajinder Sahota
Deputy Executive Officer, Climate Change and Research
California Air Resources Board
1001 I Street, Sacramento
California 95814

Subject: Comments on April 10, 2024 LCFS Workshop

Dear Ms. Sahota,

Thank you for the opportunity to comment on the subject workshop and LCFS regulation changes as proposed by staff. Honda recently introduced the Honda Prologue and Acura ZDX all-electric light-duty (LD) vehicles as well as the Honda CRV e:FCEV plug-in hydrogen fuel cell electric LD vehicle, and announced plans to expand fuel cell sales into medium and heavy duty (MHD) hydrogen fuel cell electric vehicles. We recognize deeply that the LCFS program as a vital component of the zero-emission vehicle policy framework that supports development of both fueling infrastructure and vehicle sales.

187.1 Overall, we support staff's recommendations to enact a steeper step-down and accelerate the auto adjustment mechanism to bolster credit prices as soon as possible.

187.2 For hydrogen specifically, we believe the LD hydrogen refueling infrastructure (HRI) program was working well before credit prices precipitously dropped in 2023. In addition to the steeper step-down, we urge you to maintain the program at the current 1,200 kg/d and 15-year crediting, with no geographic requirements. The proposed restrictions could limit the number of hydrogen stations deployed.

187.3 Similarly, for the heavy-duty (HD) HRI proposal, we recommend allowing 15-year crediting and removing the geographic restrictions. Allowing station developers to utilize the longer crediting period with greater freedom to place stations near customers will be needed to ensure adequate fueling coverage for these HD trucks.

187.4 On the LD electric vehicle side, we do believe that LD vehicle incentives are still necessary as the market transitions from early adopter to mainstream buyers, and that a robust and Clean Fuel Reward (CFR) program is needed. Auto OEMs are best situated in the market to make an impact by administering the CFR program at the point where the customer makes a purchase decision. In addition, the staff proposal to split the CFR

187.5 program between LD and MHD vehicles will blunt the impact of the program in LD by generating too-small rewards.

We applaud staff's work on this important regulatory framework to enable hydrogen and electric transportation. We believe making these changes will provide a critical signal to the market that all sectors will benefit from zero carbon fuels.

Sincerely,

Ryan Harty,
Director, Energy Solution Business Division
Sustainability & Business Development Business Unit

May 10, 2024

Matthew Botill
Industrial Strategies Division Chief
California Air Resources Board

Comment submitted electronically

**RE: Kore Infrastructure’s Comments on the Importance of Low Carbon Intensity
Power Sourcing to Achieving California’s Wildfire Risk Reduction and
Hydrogen Goals**

Dear Mr. Botill:

This comment letter is submitted on behalf of Kore Infrastructure (“Kore”) to provide input to the California Air Resources Board (“CARB”) regarding how the LCFS regulatory amendments pertaining to power sourcing can facilitate achievement of California’s critical goals of reducing wildfire risk and expanding hydrogen supply.

Kore’s Modular Biomass to Hydrogen Technology

Kore is a world leading company utilizing high temperature, slow pyrolysis to convert organic feedstocks into an energy dense biogas and a solid carbon char through the deployment of shipping container sized modular units. Kore previously operated a 24 ton per day woody biomass to RNG modular facility at the SoCalGas Olympic Boulevard Site in Los Angeles.¹ As recently described in recent Forbes Magazine:

Kore Infrastructure has unveiled a collaboration with the Tule River Economic Development Corporation to address two critical challenges simultaneously—wildfire hazards and the decarbonization of transportation.

This partnership, demonstrating a significant leap in Kore's commercialization, will employ indigenous workers from the Tule River Tribe to clear non-merchantable trees and brush from around power transmission lines then pyrolyzing that biomass at a Kore facility to produce carbon-negative hydrogen—a “deadwood-to-clean-energy” solution.

Not only does this project reduce the risk of forest fires and provide carbon-free hydrogen, but it also offers employment opportunities to an underserved rural community.

The hydrogen produced by Kore will be sold to Toyota Tsusho to power industrial vehicles like forklifts for its operations at the Port of Los Angeles.²

¹ SoCal Gas, “SoCalGas Announces the Commission of Carbon-Negative Waste-to-Energy Technology at Low Angeles Facility,” (July 20, 2022), at <https://newsroom.socalgas.com/press-release/socalgas-announces-the-commissioning-of-carbon-negative-waste-to-energy-technology-at>

² Eric Kobayashi-Solomon, in Forbes-Innovation-Sustainability, “Kore’s Latest Project Cuts Fire Risk and Creates Green Hydrogen,” (February 26, 2024), at <https://www.forbes.com/sites/erikkobayashisolomon/2024/02/06/kores-latest-project-cuts-fire-risk-and-creates-carbon-negative-fuel/?sh=1eb431ba4153>

Kore's Tule River Economic Development and Wildfire Risk Reduction Project

As noted in the Forbes article, Kore Infrastructure has partnered with the Tule River Economic Development Corporation of the Tule River Tribe of California to develop a forest biomass to carbon negative hydrogen project on the Tule River Tribe reservation east of Porterville, CA. Kore's standard design, factory built, modular technology provided the right-sized platform for the Tule River Economic Development Corporation to develop a renewable energy campus at a prudent capacity, then scale to meet growing demand for carbon negative energy. This project will bring multiple benefits to the State and local community, including:

- Reducing wildfire risk in the Sierra Nevada Forest
- Decarbonizing California transportation with zero emission hydrogen
- Reducing atmospheric CO₂ through carbon sequestration
- Providing an opportunity to decarbonize cement manufacturing to meet SB 596 Low Carbon Cement Standards
- Creating new jobs and economic activity in an SB 535 Disadvantaged Community

The project will process 48 tons per day of woody biomass, primarily non-merchantable dead dying, and diseased trees removed from Sierra Nevada Forests to reduce wildfire risk. The Tule River Tribe currently manages 57,000 acres of Sierra Nevada Forest. Orchard wood waste from the Central Valley will provide supplemental feedstock when forest access is unavailable due to weather or other adverse conditions.

The project will generate two metric tons per day of fuel cell quality hydrogen (99.999% purity.) Toyota Tsusho will offtake this hydrogen for a project to decarbonize shipping container movement at the Ports of Los Angeles and Long Beach by converting diesel powered equipment to fuel cells. This hydrogen may also be available to local users as demand for fuel cell quality hydrogen increases. The project will also consider using fuel cell electric vehicles (FCEV) to transport feedstock, hydrogen, and biocarbon to reduce the project's carbon intensity.

The project will also generate about 10 tons per day of biocarbon, an elemental carbon coproduct with many beneficial uses. As a soil amendment, biocarbon increases plant yield while reducing irrigation water and fertilizer. Biocarbon also sequesters about 3 tons of CO₂ for every ton incorporated into the soil. And biocarbon has a heating value comparable to fossil coal, so it can be used to decarbonize difficult to decarbonize industries like cement manufacturing which accounts for 4-percent of California's greenhouse gas (GHG) emissions.

The Porterville area where this facility will be located is an SB 535 Disadvantaged Community. The project will bring over a dozen jobs and increased economic activity to this community.

This is the first phase of a project that is being master planned to triple in size, increasing the GHG benefits and adding additional jobs and economic activity. The Tule River Economic Development Corporation is also considering replicating this model for several other projects throughout the Central Valley.

Woody Biomass from Wildfire Risk Reduction is an Ideal Feedstock for Hydrogen in California

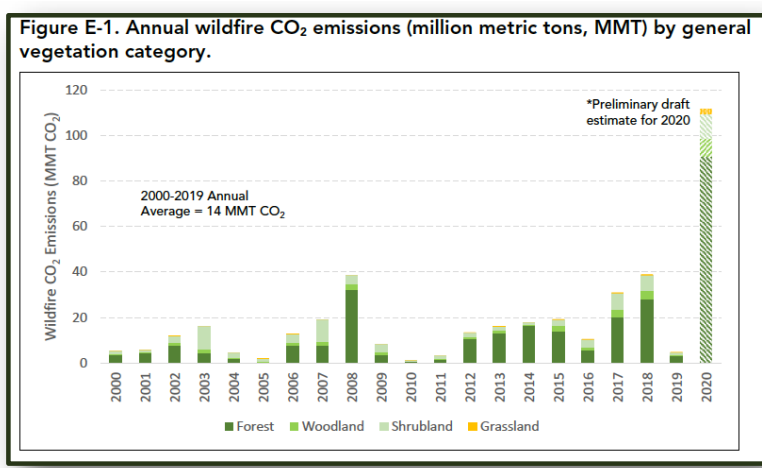
The scientific feasibility of deploying forest woody biomass in transportation has been highlighted by the Lawrence Livermore National Laboratory's Getting to Neutral Report and serves as the LLNL Report's second Carbon-Reduction Pillar:

Convert Waste Biomass to Fuels and Store CO₂

"Waste biomass is widely available across California, with about 56 million bone dry tons per year available from trash, agricultural waste, sewage and manure, logging, and fire prevention activities (...). Today, this biomass returns its carbon to the atmosphere when it decays or burns in prescribed fires or wildfires, or is used to produce energy at a power plant that vents its carbon emissions. (...)

Converting this biomass (primarily forest biomass) into fuels with simultaneous capture of the process CO₂ emissions holds the greatest potential for negative emissions in the State. A broad array of processing options is available, and includes (...) conversion of woody biomass to liquid fuels and biochar through pyrolysis; and conversion of woody biomass gaseous fuels through gasification."(...)³

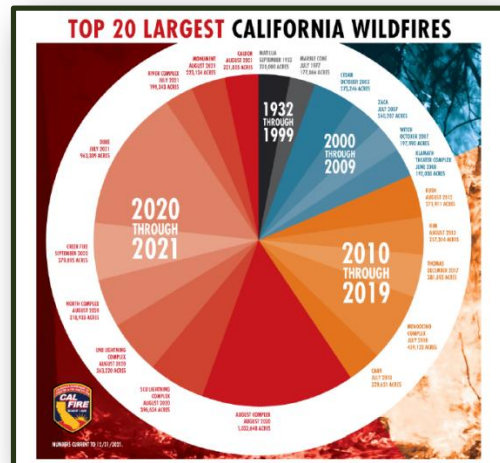
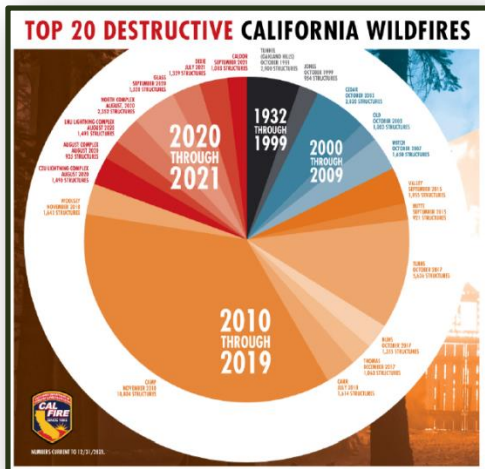
As a result of the changed conditions in the forests coupled with climate change, California's forests have changed from a carbon sink to a carbon source. Wildfires nationwide have drastically increased in intensity and frequency in recent years, creating not only increasing risk to life, health and property but also generating substantial GHG emissions to exacerbate the effects of climate change.⁴



³ Sarah E. Baker, Joshua K. Stolaroff, George Peridas, et al, Getting to Neutral: Options for Negative Carbon Emissions in California, January, 2020, Lawrence Livermore National Laboratory, LLNL-TR-796100, at https://www-gs.llnl.gov/content/assets/docs/energy/Getting_to_Neutral.pdf, (hereafter Getting to Neutral Report) at p. 4.

⁴ California Air Resources Board, "California Wildfire Emission Estimates," at <https://ww2.arb.ca.gov/wildfire-emissions>, see "Public Comment Draft: GHG Emissions of Contemporary Wildfire, Prescribed Fire, and Forest Management Activities," at p. i, available at <https://ww2.arb.ca.gov/wildfire-emissions>

The national trend is particularly acute in California. Due to its novelty and uncertainty, the new reality of wildfire GHG emissions from forests has not yet been integrated into California's climate policy as is reflected by these slides presented by former CalFire Staff Chief Tim Robards.⁵



The LCFS Carbon Intensity Score for Kore's Hydrogen Pathway Will Materially Influence the Economic Viability of Kore's Facilities

The focus of the LCFS program structure is to reduce the CI of transportation fuels in California. Kore has not yet operated a modular facility at steady state operation for a calendar quarter as is necessary to provide sufficient data to support a provisional LCFS pathway application. Therefore, in lieu of a Kore-specific pathway score, this comment relies upon an analysis of the typical carbon intensity performance of technologies capable of converting woody biomass to hydrogen, including pyrolysis. Please see attached analysis entitled "Carbon Negative Biomass Options- Electric Power Implications," prepared by Stefan Unnasch of Life Cycle Associates, LLC attached as **Exhibit A** (hereafter "Pyrolysis LCA Analysis").

As is established by the Pyrolysis LCA Analysis, the critical factor that essentially determines the CI of hydrogen produced from woody biomass by pyrolysis is grid electricity. The total calculated CI is 54.2 with 47.5 of this amount (88%) resulting from grid electricity input.⁶ As one would expect, the opportunity to source zero CI power from wind, solar or another qualifying source drops the CI score to 6.7.⁷ While not the focus of this comment, an even more favorable CI score is established if the carbon storage benefit that the co-product of biochar is recognized. Under the zero CI electricity plus carbon storage recognition of pyrolysis, the CI score would be -172 gCO₂e/MJ.

⁵ Former CalFire Staff Chief Tim Robards, "The Urgency and Scope of the Problem," Presentation to the Department of Conservation's Forest Biofuels Gasification Pilot Program, (April 5, 2022), as referenced by Graham Noyes, Alfredo Arredondo, Haris Gilani, Dan Sanchez, Robin Vercruse, Turning Wildfire Tinder Into Low Carbon Fuels (May 2022), at https://yosemitestanislauassolutions.com/wp-content/uploads/2022/05/Turning-Wildfire-Tinder-Into-Low-Carbon-Fuels_White-paper-for-Policymakers.pdf, at p. 4, footnote 7.

⁶ See Exhibit A, at Table 1, at p. 1.

⁷ Id. at Table 2, at p. 4.

For the following calculations, we will use the pyrolysis to hydrogen grid mix score of 54.2 rounded to 54, the zero emission electricity score of 6.7 rounded to 7, and the combined zero emission electricity and carbon storage score of -172 gCO₂/MJ. CARB's LCFS Dashboard provides a credit calculator that is an excellent tool for determining the value of LCFS credits based on user inputted values for compliance year, LCFS credit price, CI score, vehicle utilized, fuel displaced, and other factors.⁸ Kore plans to focus on the heavy-duty vehicle market to support the short-haul trucking of woody biomass to its facilities by hydrogen truck FCEVs so the following calculation is based on: the compliance year of 2025, reference fuel of diesel, vehicle-fuel EER of 1.9, and fuel equivalency of dollars per kilogram of hydrogen. The LCFS credit prices used are low (\$50/MT), medium (\$150/MT), and high (\$250/MT). Utilizing these parameters yields the following credit values per kg hydrogen, premium values for lower CI fuel, and increased revenues per year and over 15-year return on investment period.

CI Score	\$50/MT	\$150/MT	\$250/MT
54	\$.66	\$1.99	\$3.32
7	\$.95	\$2.84	\$4.73
Premium Value	\$.29	\$.85	\$1.41
Annual Premium Value @ 730 MT/yr	\$211,700	\$620,500	\$1,029,300
Premium Over 15 Year Return on Investment Period	\$3,175,500	\$9,307,500	\$15,439,500
CI = -172	\$2.02	\$6.06	\$10.10
Premium Value (-172) vs. CI Score of 54	\$1.36	\$4.07	\$6.78
Annual Premium Value @ 730 MT/yr	\$992,800	\$2,971,100	\$4,949,400
Premium Over 15 Year Return on Investment Period	\$14,892,000	\$44,566,500	\$74,241,000

As demonstrated in the prior analysis, the LCFS regulatory structure pertaining to Low-CI power sourcing has a material impact on the financial performance of a KORE facility by altering the revenue stream that the LCFS programs provides to low carbon fuel production facilities that supply qualifying transportation fuels to California including hydrogen. While the total amount of revenue varies across the low, medium and high market scenarios, all three scenarios are highly significant in a commodity fuel market that trades fuel on basis points rather than pennies. An additional revenue stream of \$0.29 to \$6.78 per kilogram of fuel produced can swing a marginal project to profitably thereby attracting debt and equity investment that would otherwise not participate. KORE's standard design, factory-assembled, skid-mounted facilities are capital-light projects as compared to other pyrolysis facilities due to their modular nature. The modular design allows the technology to be situated in remote areas, including in or adjacent to California

⁸ CARB, "LCFS Data Dashboard," Credit Value Calculator available for download via Figure 7 link, at <https://ww2.arb.ca.gov/resources/documents/lcfs-data-dashboard>

forests. KORE facilities are long-term investments that may not provide a full return on investment prior to a 15-year period. However, once the capital expenditure for the facility is recovered, the opportunity to make fuel from woody biomass cleared from forest management is a highly attractive one.

Over that 15-year period, the ability of a KORE plant to source zero-CI power will deliver **\$3,175,500** in additional revenue in a low LCFS market, **\$9,307,500** in a medium LCFS market, and **\$15,439,500** in a high LCFS market. It is for this reason that low carbon fuel producers like KORE are keen to access the Low-CI power market.

Over the same 15-year period, the ability of a KORE plant to source zero-CI power and have its biochar recognized as sequestered carbon will deliver **\$14,892,000** in additional revenue in a low LCFS market, **\$44,566,500** in a medium LCFS market, and **\$74,241,000** in a high LCFS market. It is for this reason that low carbon fuel producers like KORE are keen to access the Low-CI power market.

Optimal California Policy for Hydrogen Power Sourcing
Will Maximize Federal Funding to California and Speed Decarbonization

188.01 In this LCFS rulemaking, CARB can and should enable hydrogen producers to source Low-CI Power through a viable book-and-claim accounting mechanism. Kore supports the comments of the hydrogen production industry on these issues, and encourages CARB to continue to engage with the leadership of ARCHES to identify the optimal structure to integrate into the LCFS regulation with recognition of California's unique protections that guard against resource shuffling.

Through this regulatory strategy, CARB will achieve upstream emission reductions and stimulate expansion of Low-CI power generation capacity, storage and transmission during the peak spending period of IRA and Infrastructure Investment and Jobs Act ("IIJA").

As stated in a Brookings Institute Report issued on February 1, 2023:

Between the Infrastructure Investment and Jobs Act (IIJA) and the Inflation Reduction Act (IRA), the 117th Congress invested \$1.25 trillion across the transportation, energy, water resources, and broadband sectors for the next five to 10 years. It's now the Biden administration's responsibility to get that historic amount of money out the door—yet the bulk of it is still sitting in federal coffers or unrealized tax credits on the federal balance sheet.⁹

As highlighted by the Brookings Institute Report, taken as a whole, the IIJA and IRA will deliver well over a trillion dollars to the U.S. economy over the period of a decade. It is a substantial undertaking for the federal government to establish the necessary programs, program structures, eligibility requirements, application process, and oversight for the programs. The IIJA was

⁹ Adie Tomer, Caroline George and Joseph W. Kane for Brookings Research, "The start of America's infrastructure decade: How macroeconomic factors may shape local strategies," at <https://www.brookings.edu/articles/the-start-of-americas-infrastructure-decade-how-macroeconomic-factors-may-shape-local-strategies/>

signed into law on November 15, 2021,¹⁰ and the IRA was signed into law on August 16, 2022.¹¹ However, according to a comprehensive analysis released on May 8th by Politico, only a small slice of the funds have been spent. According to Politico:

- *Less than 17 percent of the \$1.1 trillion those laws provided for direct investments on climate, energy and infrastructure has been spent as of April, nearly two years after Biden signed the last of the statutes.*
- *Out of \$145 billion in direct spending on energy and climate programs in the Inflation Reduction Act, the biggest climate law in U.S. history, the administration has announced roughly \$60 billion in tentative funding decisions as of April 11. (...)*
- *And only \$125 billion has been spent from the \$884 billion provided by the infrastructure law and the pandemic law, both of which Biden signed in 2021. Roughly \$300 billion of that won't be legally available to spend until the next two fiscal years. (...)*
- *The IRA also unleashed a gusher of private company investments in clean energy and manufacturing by offering a series of tax breaks that, based on recent estimates, are worth at least \$525 billion.*

As noted by Politico, “Now time is running short for these efforts to show results before voters decide whether to bring back Trump, who has denounced the climate and infrastructure laws, mocked wind power and electric cars and inaccurately described the IRA as the “biggest tax hike in history.”¹²

Kore is a Phase I Recipient of Funding
Through the Carbon Negative Biofuels Program for the
Tule River Economic Development and Wildfire Risk Reduction Project

The optimal funding opportunity available to Kore is through U.S. EPA's Climate Pollution Reduction Grant Program. There is approximately \$4.75 billion in funding in this program which is a state block grant program. Governor Newsom and CARB have identified the Carbon Negative Biofuels Programs as among California's top tier priorities. The State is targeting up to \$500 million from EPA to fund the program. This funding is essential given that the California Phase II funding for the program was eliminated due to California's current budget deficit.

The following is excerpted from CARB's Priority Climate Action Plan report to EPA.

¹⁰ U.S. Department of Transportation, “Bipartisan Infrastructure Law/Infrastructure Investment and Jobs Act,” at <https://www.phmsa.dot.gov/legislative-mandates/bipartisan-infrastructure-law-bil-infrastructure-investment-and-jobs-act-iiija>

¹¹ U.S. Department of the Treasury, “Inflation Reduction Act,” at <https://home.treasury.gov/policy-issues/inflation-reduction-act#:~:text=On%20August%2016%2C%202022%2C%20President,made%20in%20the%20nation's%20history.>

¹² POLITICO, “Biden's big bet hits reality,” by Jessie Blaeser, Benjamin Storrow, Kelsey Tamborrino, Zack Colman and David Ferris, at <https://www.politico.com/interactives/2024/biden-trillion-dollar-spending-tracker/> (emphasis in original).

Energy Measure 4: Bolster Healthy Landscapes and Resilient Communities through Expanding the Biomass to Carbon Negative Biofuels Program

This measure seeks to expand the existing Biomass to Carbon Negative Biofuels Program at the California Department of Conservation, and ultimately play a unique role in addressing climate change by producing low-carbon and carbon-negative fuels from forest and agricultural biomass while addressing critical issues such as forest health, wildfire risk, and air quality concerns. In particular, using agricultural waste that has historically been burned in the San Joaquin Valley will help reduce fine particulates across some of the State's most overburdened low-income and disadvantaged communities. The Department of Conservation would lead this measure, in partnership with various State and federal agencies, local governments, and Tribes. These entities – alongside community input to maximize local co-benefits – could collectively contribute to the measure's development, solicitation crafting, and application review processes.

Depending on total additional funding added to this measure, it could yield annual emissions reductions of approximately 10,000 MTCO₂e, as well as roughly 38,000 MTCO₂e cumulatively between 2025 and 2030, and 230,000 MTCO₂e cumulatively between 2025 and 2050.

The financial scope of the program is significant, with implementation costs ranging from \$60 million to \$500 million per facility, where grants are designed to cover at least 10% of the total costs. CPRG funding would be leveraged and matched with private and public funding, including local funding from jurisdictions – many of which are rural – that would benefit from these facilities with enhanced forest resilience, improved air quality, and jobs. Additionally, by avoiding wildfire risks and by providing an alternative to the open burning of agricultural waste, this measure promises substantial public health and safety benefits, for rural low-income and disadvantaged communities as well as Tribal Nations, many of which live in California's San Joaquin Valley, and face persistent air quality challenges. The program also aims to create hundreds of construction jobs and numerous long-term operational roles, with a focus on local hiring to boost employment for priority populations. This measure can yield biochar and other soil amendments that have the potential to both store carbon and improve soil quality.

The transformative potential of this program is significant. It is expected to lead to notable advancements in sustainable forestry and biofuel technology, thereby setting a national model for combining rural economic opportunities with environmental stewardship and improvements in air quality. The program also can contribute substantially to renewable energy, potentially supplying renewable electricity to the grid and replacing fossil fuel combustion.

This measure would include several major milestones. One month after CPRG funding was awarded, a solicitation would be finalized and made available for biofuels implementation. Within two months, five existing pilot regions could be awarded funds to help with biomass aggregation, and a workshop for all other interested parties would be held, in part to help ensure direct benefits to local communities. Within five months, biofuels implementation awards could be made. Within 18 months, the final legal entities in aggregation pilot regions would be established, and within two years, the first long-term feedstock contracts would be available through aggregation pilot regions. Between two and five years after the CPRG award, facilities would be built, generating carbon-negative fuels. Tracking these milestones will help ensure measure success as could the number of sites and facilities funded by the measure, biofuel

produced or energy sold, aggregation site purchases, bone-dry tons of biomass acquired, acres of improved forests, plans indicating agricultural areas targeted, lifecycle carbon assessments, awardee facility job counts, and others as appropriate.¹³

**An Analysis of All Remaining Available IIRA & IIJA
Has Identified Substantial Additional Federal Funding Opportunities for Kore**

Due to the direct nexus between LCFS credit revenues and the economic viability of projects that low carbon fuel developers seek to finance and build, a group of low carbon fuel production companies has been funding a comprehensive analysis by Zero Emission Advisors and directed by NLC. This analysis has focused on the funding components contained in the IIJA and IRA that are most relevant to low carbon fuels and low carbon energy including funding designated for land restoration, feedstock development, wildfire risk management, energy generation, energy storage, large scale transmission, microgrids, waste and sanitation, advanced fuel technologies, hydrogen, SAF, hydrogen fuel cell and battery electric vehicles, alternative fuel and charging stations, and community assistance.

Subsequent to the identification of all of the remaining relevant funding opportunities that have a sufficient nexus with the low carbon fuel sector, the focus of the IRA/IIJA project has been to identify the highest value potential sources of funding for specific companies given that company's feedstock, fuel, technology, and its possible ancillary benefits, e.g. Kore's potential to utilize woody biomass, provide hydrogen and energy to remote rural communities, and provide new jobs and economic development to remote rural communities. **Exhibit B** provides summaries and available funds for the programs that have strong potential to either provide funding directly to Kore or to upstream wildfire risk management funding for tribes or other community partners or downstream funding for heavy-duty vehicles to transport the woody biomass. The following graphic depicts these programs and funding opportunities.

¹³ CARB, "The State of California's Priority Climate Action Plan," Submitted to the U.S. Environmental Protection Agency, at https://ww2.arb.ca.gov/sites/default/files/2024-03/California%20CPRG%20Priority%20Climate%20Action%20Plan%202024%20March%201_0.pdf,

IMMEDIATE FEDERAL FUNDING AVAILABLE BIOMASS PLANT



\$6.75+B

TRIBAL HAZARDOUS FUELS MANAGEMENT-

- Regional Conservation Partnership Program (RCPP) (\$4.95B)(\$1.5B Released 4/24)(Max Award \$25M Min Award \$250K)(8/24 Deadline)
- Hazardous Fuels Reduction Projects in Wildland Urban Interface (\$1.8B)



**Max Community Fund
Hazardous Fuel Management
\$6.75+B**



\$200M

KORE DIRECT FEEDSTOCK DEVELOPMENT FUNDS-

- Removal Of Vegetation For Biochar And Innovative Wood Products (\$100M)
- Wood Innovations Grant Program (\$100M)(\$20M Annually)(\$300K Per Project)

Kore

**Innovative
Feedstock Processing
Plant CAPEX \$3.5M**



\$4.75B

KORE SEED FUNDING FOR MULTIPLE LOCATIONS

- Climate Pollution Reduction Grants: Implementation Grants (\$4.75B) (10% of CAPEX is CARB Estimate per Project Total) (Direct Investment)

Kore

**Pyrolysis Plant
CAPEX \$26M**



\$500M

KORE DIRECT FACILITY INVESTMENT-

- Clean Hydrogen Manufacturing Recycling Research, Development, and Demonstration Program (\$500M) (\$100M for 2024)(Release Date TBD)

Kore

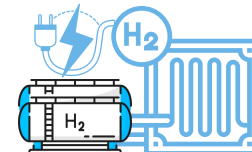
**Gas Processing Plant
CAPEX \$65M**



\$505M

Long Duration Storage and Grid Resiliency

- Energy Storage Demonstration and Pilot Grant Program (\$355M) (\$150M Estimate for 2024)
- Long-Duration Energy Storage Demonstration Initiative and Joint Program (\$150M)



**California Grid
Improvement Funds \$625M**



\$1B

ZE VEHICLE FUNDS

- Clean Heavy-Duty Vehicles (\$1B)

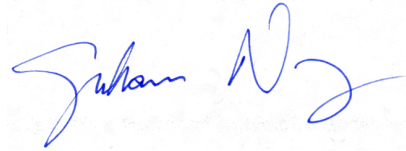


**Max ZE Heavy Duty Funds
\$1B+**

Conclusion

Kore appreciates the opportunity to comment on CARB's proposed amendments to the LCFS. We look forward to working with CARB to further tailor and ultimately implement amendments to the LCFS regulations.

Sincerely,



Graham Noyes
Noyes Law Corporation

Cc: Secretary Wade Crowfoot, Natural Resources Secretary
Elizabeth Betancourt, Natural and Working Lands Policy Advisor

Carbon Negative Biomass Options – Electric Power Implications

Prepared by Stefan Unnasch, Life Cycle Associates, LLC

Date: May 8, 2024

The carbon intensity of hydrogen options plays a critical role in the development of projects in California. Numerous funding sources are available for the mitigation of GHG emissions protection of natural lands and development of low carbon fuel technologies. Several fuel pathways illustrate the role of electric power which is required for material movement, syngas compression, pumps, hydrogen compression, and liquefaction.

The pyrolysis of biomass residues to hydrogen with the co-production of biochar illustrates the opportunity. Fuel producers such as Kore have the opportunity to design systems with a wide range of process configurations. Their decisions on energy mix are driven by the carbon intensity and its effects on programs such as the Inflation Reduction Act (IRA) and LCFS.

The potential configuration of hydrogen production systems can result in a range of hydrogen production rates. Generally, the highest hydrogen production rates would be achieved with imported low CI electric power while lower hydrogen production rates could be achieved with configurations that burn more fuel gas to generated power on-site. A system that maximizes hydrogen output with input from low CI grid power would result in the largest possible emission reductions.

Biomass provides several options for carbon negative fuel pathways through the sequestration of CO₂ or production of biochar in combination with the use of low carbon biomass. The feedstocks including agricultural residues and forest residues collected to avoid wildfire risk.

The carbon intensity of many fuel options below 0 g CO₂e/MJ is possible due to the storage of carbon. In order to fully incentivize such systems, low carbon fuel programs should take into account all aspects of the carbon intensity, including the production of feedstock transport and use of processing energy, including chemicals, natural gas and electric power. Electric power for processing energy plays a role in many fuel pathways. The CI values for hydrogen systems without the effect of carbon storage are shown in Table 1.

Table 1. CI of Biomass to Fuel Pathways

Pathway	Feedstock	Refining	Grid Electricity	Transport	Fuel Combustion	Total
Petroleum Diesel	12.0	14.0	1.0	1.0	71.0	99.0
FT Diesel CCS	4.8	1.0	14.0	2.0	1.0	22.8
Plasma H ₂ CCS	4.7	1.0	37.5	11.0	0.0	54.2
Pyrolysis LH ₂ , Biochar	4.7	0.0	47.5	2.0	0.0	54.2

EXHIBIT A

LCA.8192.2.2024



Figure 1 shows the life cycle GHG emissions on a well to tank basis including the combustion of fuel. A MJ of biomass-based diesel displaces a MJ of diesel. However, this comparison does not take into account efficiency improvements associated with hydrogen fuels cell vehicles and the displaced diesel fuel would be roughly twice that on hydrogen on an energy basis. The key components of the carbon intensity include feedstock production, electric power for system operation and hydrogen liquefaction and compression and carbon stored either as biochar or CO₂. Carbon storage in the form of CCS or biochar could bring these fuel pathways into negative values.

Fuel developers could choose to generate power on-site; however, such a choice comes at the expense of capital cost and fuel production yield. Syngas, which otherwise could be converted to hydrogen, could power a gas turbine or steam boiler to increase on-site power. This approach minimized the use of grid power at the expense of the intended product output from the biomass energy system resulting in lower revenues and potential for incentives such as the IRA.

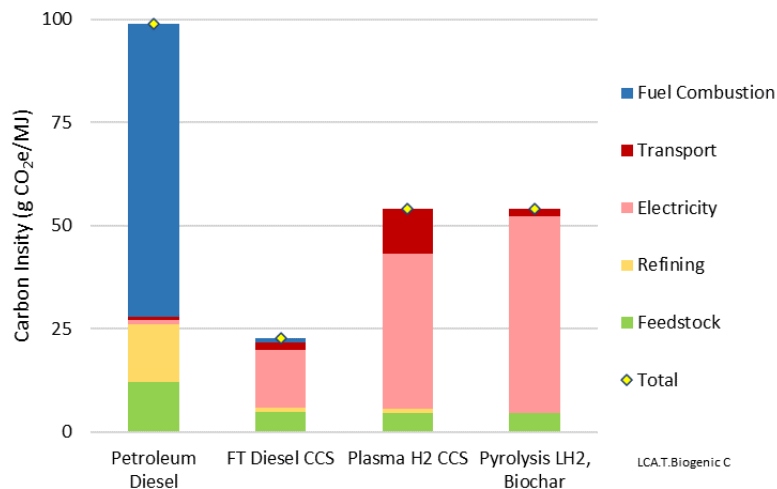


Figure 1. Typical carbon intensity of biomass to fuel pathways (excluding carbon storage).

The IRA guidance takes into account the marginality of renewable power for not only hydrogen production by electrolysis but all fuel production systems. As such, producing low CI hydrogen with renewable power requires achieving the “three pillars” of renewability such that the source of power is new, time coincident, and generated within the region where the power is consumed. These IRA requirements apply not only to hydrogen production for electrolysis but for all process energy inputs to make hydrogen. The IRA requirement is considered to be stringent and alignment with the California program would be appropriate.



EXHIBIT A

LCA.8192.2.2024



The use of zero carbon process power is illustrated in Figure 2. The reduction in GHG emissions from grid average power eliminates emissions associated with processing equipment, hydrogen compression, CO₂ capture and liquefaction, and hydrogen liquefaction. Essentially most of the positive GHG emissions are eliminated allowing for the CO₂ removal benefits of biomass strategies to be utilized to their full effect.

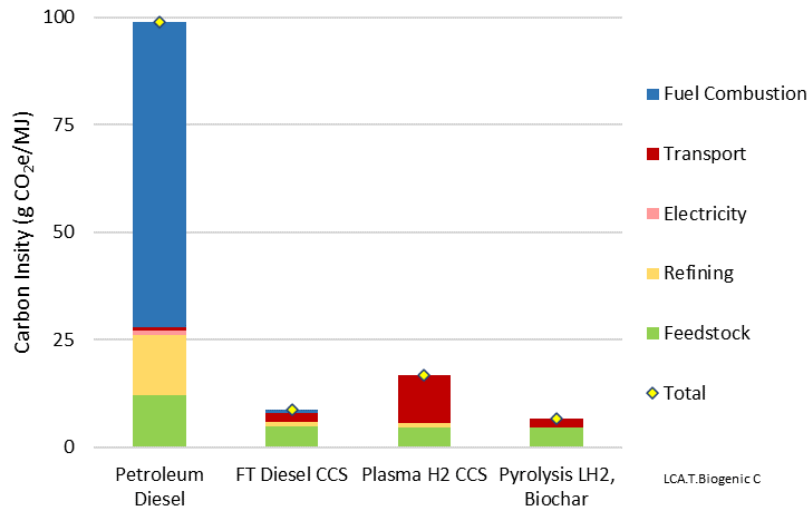


Figure 2. Biomass fuel pathways with renewable process power (excluding carbon storage).

Table 2 illustrates the potential GHG reduction potential when carbon removals such as CCS¹ and biochar^{2, 3} storage are included. Both of these strategies are cited as key options for achieving California's climate goals. CCS sequesters CO₂ for permanent storage while biochar allows for the storage of inactive carbon in soils. CO₂ which is captured from gasification processes is also a potential feedstock for e-fuels which use low CI power to create hydrogen which is reacted to produce syngas for methanol or Fischer Tropsch fuel production.

¹ <https://ww2.arb.ca.gov/resources/documents/carbon-capture-and-sequestration-protocol-under-low-carbon-fuel-standard>

² https://resources.ca.gov/-/media/CNRA-Website/Files/Initiatives/Expanding-Nature-Based-Solutions/CNRA-Report-2022---Final_Accessible.pdf

³ https://bof.fire.ca.gov/media/oobbtosm/thengane_2021_ca_biochar_market-002-_ada.pdf



EXHIBIT A

LCA.8192.2.2024



Table 1. CI of Biomass to Fuel Pathways

Pathway	CI (g CO ₂ e/MJ Fuel)		
	Grid Electricity	Wind/Solar	Wind/Solar and Storage
Petroleum Diesel	99	98	0
FT Diesel CCS	22.8	8.8	-165.6
Plasma H ₂ CCS	54.1	16.7	-180.6
Pyrolysis LH ₂ , Biochar	54.2	6.7	-172.0

Figure 3 shows the net CI when carbon storage is included in the pathway. The use of low CI power enables maximum fuel production. Furthermore, grid electricity does not detract from the carbon removals achieved with these pathways.

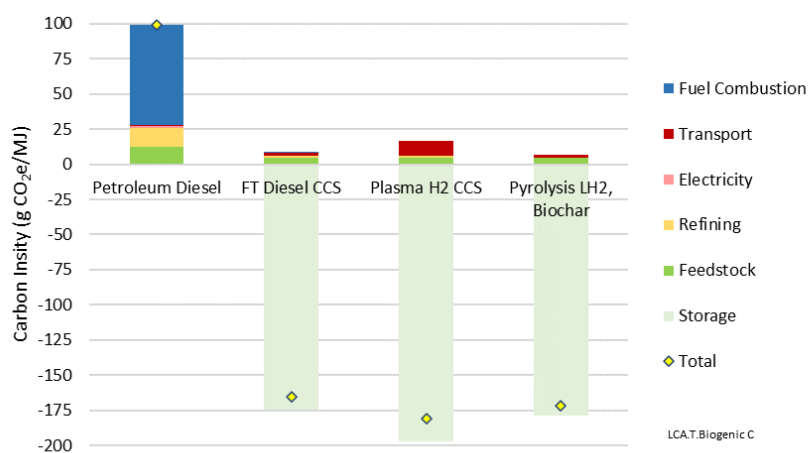


Figure 3. Biomass fuel pathways with renewable process power and biochar.



**Other Potential Federal Funding Sources for Kore
And Kore-related Projects**

Agency	Program	Program Description	Funding Amount
Department of Agriculture	Wood Innovations Grant Program	To provide grants under the wood innovation grant program in section 8643 of the 2018 Farm bill, including for the construction of new facilities that advance the purposes of the program and for the cost of transporting of biomass from hazardous fuels reduction projects to facilities for processing.	\$100,000,000
Department of Agriculture	Hazardous Fuels Reduction Projects in Wildland Urban Interface	To complete hazardous fuels reduction projects on National Forest System land within the Wildland Urban Interface.	\$1,800,000,000
Department of Agriculture	Regional Conservation Partnership Program (RCPP)	To support the Regional Conservation Partnership Program (RCPP), a partner-driven approach to conservation that funds solutions to natural resource challenges on agricultural land by leveraging collective resources and collaborating to implement natural resource conservation activities.	\$4,950,000,000

Agency	Program	Program Description	Funding Amount
Department of Agriculture	Removal Of Vegetation For Biochar And Innovative Wood Products	This program, through contracting or employing crews of laborers, supports the modification and removal of flammable vegetation on Federal land and for using materials from treatments, to the extent practicable, to produce biochar and other innovative products, including through the use of locally based organizations that engage young adults, Native youth, and veterans in service projects, such as youth and conservation corps.	\$100,000,000
Department of Energy	Long-Duration Energy Storage Demonstration Initiative and Joint Program	To establish a demonstration initiative composed of demonstration projects focused on the development of long-duration energy storage technologies.	\$150,000,000
Department of Energy	Energy Storage Demonstration and Pilot Grant Program	To enter into agreements to carry out 3 energy storage system demonstration projects.	\$355,000,000
Department of Energy	Clean Hydrogen Manufacturing Recycling Research, Development, and Demonstration Program	To provide Federal financial assistance to advance new clean hydrogen production, processing, delivery, storage, and use equipment manufacturing technologies and techniques.	\$500,000,000
Environmental Protection Agency	Clean Heavy-Duty Vehicles	To provide funding to offset the costs of replacing heavy-duty Class 6 and 7 commercial vehicles with zero-emission vehicles; deploying infrastructure needed to charge, fuel, or maintain these zero-emission vehicles; and developing and training the necessary workforce.	\$1,000,000,000

Agency	Program	Program Description	Funding Amount
Environmental Protection Agency	Climate Pollution Reduction Grants: Implementation Grants	To provide grants to Tribes, states, air pollution control agencies, and local governments to develop and implement plans for reducing greenhouse gas emissions. The statute allocates \$250 million for planning grants and \$4.750 billion for implementation grants.	\$4,750,000,000

May 9, 2024

The Honorable Liane M. Randolph, Chair
California Air Resources Board
P.O. Box 2815
Sacramento, California 95812

RE: Updates to the Low Carbon Fuel Standard

Dear Ms. Randolph:

Indigo Ag, Inc. (Indigo Ag) appreciates the current and historic efforts by the California Air Resources Board (CARB) to reduce the greenhouse gas (GHG) emissions from transportation through the implementation of the State's Low Carbon Fuels Standard (LCFS). Since 2011, California's LCFS program has been tremendously successful and is a model for the nation and the world. Indigo Ag supports the continued evolution of the LCFS through the CARB rulemaking process. Of particular interest to Indigo Ag is the production of biofuels in the most sustainable manner.

In 2018, the Intergovernmental Panel on Climate Change (IPCC) published a Special Report on the impacts of a 1.5°C global warming above pre-industrial levels. This report found that achieving global carbon neutrality by mid-century is critical to avoiding the most catastrophic impacts of climate change.¹ Moreover, the IPCC Sixth Assessment identified land-based emissions mitigation as "the only [sector] in which large-scale carbon dioxide removal may currently and short term be possible" and that it is "crucial to limit climate change and its impacts."² The latest science finds that it is increasingly likely that the 1.5°C target will be exceeded³ and that large-scale GHG reductions are critical to meeting any state or global target.⁴

Already a leader in the response to climate change, CARB's 2022 Scoping Plan Update details sector-by-sector roadmaps for California to achieve carbon neutrality by 2045 or earlier. One critical

¹ IPCC, 2018: Summary for Policymakers. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 3-24, <https://doi.org/10.1017/9781009157940.001>.

² Nabuurs, G.-J., R. Mrabet, A. Abu Hatab, M. Bustamante, H. Clark, P. Havlík, J. House, C. Mbow, K.N. Ninan, A. Popp, S. Roe, B. Sohngen, S. Towprayoon, 2022: Agriculture, Forestry and Other Land Uses (AFOLU). In IPCC, 2022: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. <https://doi.org/10.1017/9781009157926.009>.

³ Mathews, D.H., Wynes, S. (2022) Current global efforts are insufficient to limit warming to 1.5°C. *Science* 376 (6600) 1404-1409. <https://www.science.org/doi/10.1126/science.abc3378>

⁴ Mace, M.J., Fyson, C.L., Schaeffer, M., Hare, W.L. (2021) Large-Scale Carbon Dioxide Removal to Meet the 1.5°C Limit: Key Governance Gaps, Challenges and Priority Responses. *Global Policy* 12 (51) 67-81. <https://doi.org/10.1111/1758-5899.12921>

roadmap is for the aviation sector, where the scenario includes a transition of 20 percent of aviation fuel demand to zero-emission technologies by 2045 and sustainable aviation fuel (SAF) for the other 80 percent.⁵

The agriculture sector can play a significant role in helping California meet the goal of generating SAF. Practices including optimizing fertilizer application, reducing tillage, using enhanced-efficiency fertilizers, double-cropping and planting cover crops have the potential to reduce the CI of fuels by more than 40 g CO₂e/MJ.⁶ These practices are not limited to their GHG benefits; they provide “additional ecosystem service benefits, including watershed protection, increased biodiversity, and improved soil health and fertility.”⁷

About Indigo Ag

Indigo Ag uses microbiology and digital technology to improve the quality, yields and environmental sustainability of agriculture. We continue to expand our expertise to streamline the ability of farms to tap into environmental markets. Using a combination of rigorous soil sampling, biogeochemical models and remote sensing (including satellite analytics), Indigo Ag can accurately determine the current carbon footprint of a farm and quantify the impacts of management changes over time. On February 26, 2024, Indigo Ag completed its third carbon crop consisting of 163,048 agricultural carbon credits. This brings the total number of credits generated to 296,662 since 2022. All of these credits were generated under the Climate Action Reserve’s Soil Enrichment Protocol. This third carbon crop further demonstrates the repeatability of this process, the potential for exponential growth, and the appeal for both farmers and carbon buyers. It also reinforces the ability of farmers, and the agriculture industry broadly, to have a real, measurable, and durable impact on one of the world’s largest carbon sinks. The credits were produced by farmers across 28 U.S. states, including existing and new farmers and new fields in their operations.

We have also quantified supply chain reductions and sold them to many of the largest food and agribusiness companies to meet the Scope 3 reduction targets for their supply chain. Quantifying Scope 3 reductions uses a life cycle analysis approach very similar to the approach the GREET model uses to quantify the carbon intensity (CI) of fuels. We have also expanded our partnerships with ethanol producers to help them track the source of the grain in the fuels they produce.

Support the reduction of impacts of agricultural practices in feedstock production

As stated on slide 58 of the presentation from the April 10 workshop, we strongly support the need to “Reduce other impacts of agricultural practices in feedstock production”. To meet this goal, CARB should continue to ensure that the fuels used in the LCFS program are produced in the most sustainable manner. The same practices that reduce the CI of biofuels also provide valuable co-benefits including reduced soil erosion, improved water quality, and enhanced soil health. We advocate for rigorous accounting methods that quantify the GHG emissions from crop-based feedstocks. We encourage CARB to expand the ability to quantify and incentivize the production of

⁵ CARB (2022) 2022 Scoping Plan for Achieving Carbon Neutrality. <https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf>

⁶ Liu, X. et. al. (2020) Shifting agricultural practices to produce sustainable, low carbon intensity feedstocks for biofuel production. *Environ. Res. Lett.* <https://doi.org/10.1088/1748-9326/ab794e>

⁷ *ibid.*

low carbon feedstocks. Corn and other crops can be grown on a wide range of soils using a variety of farming techniques and inputs that significantly impact the CI of those fuels.

189.1 contd We encourage the Board to direct staff to dedicate time and resources to analyze the GHG and soil carbon sequestration opportunities for crop-based feedstocks and report back to the Board by the end of 2025. This focused research, analysis, and reporting by CARB staff will enable and inform potential expansions to the LCFS regulations to include climate-smart agricultural practices with the next update of the LCFS regulations.

189.1 contd There is significant opportunity to increase the adoption of climate-smart agricultural practices on U.S. farmland. A recent study found that no-till or strip-till is practiced on only 30 percent of cropland.⁸ Furthermore, these practices are not always maintained by farmers. While no-till practices were adopted on almost 8 million acres between 2012 and 2017, farmers on more than 5 million acres discontinued no-till during the same period for a net gain of only 3 million acres.⁹

Another practice that can reduce GHG emissions, the planting and cultivation of cover crops, has an even lower adoption rate than no-till. Only 5.1 percent of the approximately 300 million cropland acres planted cover crops in 2017.¹⁰

Finally, there is significant potential market for climate-smart fertilizers, also known as green and blue fertilizers. The production of fertilizer is responsible for 1 to 2 percent of global GHG emissions and the transition to the production of climate-smart fertilizers can reduce those emissions by as much as 99 percent.¹¹ Creating a price signal for these products is essential to their adoption and scale-up. The LCFS program has the potential to provide that strong and long-term incentive for farmers to implement no-till, cover crops, double-cropping, green and blue fertilizers, and other similar practices.

Support of increased LCFS targets

189.2 Indigo Ag supports the proposal by CARB to increase the CI reduction target to a 30 percent CI reduction by 2030 and a 90 percent reduction by 2045. Climate-smart agriculture will be critical in meeting these targets, particularly the 90 percent target. The increase in the State's targets will result in critical investment and reductions in transportation emissions, which represent the largest source of emissions in the State. The State targets are important because GHG emissions from transportation in California have shown multiple periods over the past decade where they have increased, including between 2014 and 2017 and 2020 and 2021.¹²

189.2 contd

⁸ Pannell, D. J., & Claassen, R. (2020). The Roles of Adoption and Behavior Change. *Applied Economic Perspectives and Policy* 42 (1) 31–41.

⁹ Sawadgo, W., & Plastina, A. (2022). The Invisible Elephant: Disadoption of Conservation Practices in the United States. *Choices* 37(1) 1–13.

¹⁰ Wallender, S., Smith, D., Bowman, M., & Claassen, R. (2021). Cover Crop Trends, Programs, and Practices in the United States. <https://www.ers.usda.gov/publications/pub-details/?pubid=100550>

¹¹ Palys, M.J., Daoutidis, P. (2023) Optimizing Renewable Ammonia Production for a Sustainable Fertilizer Supply Chain Transition. *ChemSusChem* 16, e2023005.

¹² CARB (2023) California Greenhouse Gas Emissions from 2000 to 2021: Trends of Emissions and Other Indicators, p.14 https://ww2.arb.ca.gov/sites/default/files/2023-12/2000_2021_ghg_inventory_trends.pdf

Support feedstock CI scoring according to certification system standards

CARB is proposing that all crop-based feedstock used for LCFS fuel pathways must obtain third-party sustainability certification by January 1, 2028, under an approved certification system. These sustainability certifications include a rigorous GHG accounting for feedstock CI calculation. This is similar to the approach taken in European markets, which include a rigorous GHG accounting for feedstocks. For example, both the existing Roundtable for Sustainable Biomaterials (RSB) and the International Sustainability & Carbon Certification (ISCC) sustainability certification systems include methodologies that could be adopted to meet the requirements outlined in the proposed updates to the LCFS regulations in Section 95488.9(g).^{13,14} If CARB requires farms to go through the rigorous process of third-party sustainability certification, it should consider accepting a feedstock CI score that is calculated and verified in accordance with these certification system standards. This would provide a mechanism to incentivize farmers to adopt climate-smart practices, such as no-till and cover crops. Specifically, we ask the Board to direct staff to evaluate existing GHG calculation methodologies and develop guidance around feedstock CI calculation.

Expand climate-smart agriculture practices within CA-GREET

Agricultural crops are a significant source of feedstocks for fuels within the LCFS program. Crop-derived biomass-based diesel totaled almost 200 million gallons in the third quarter of 2023, up from about 50 million gallons in the first quarter of 2021.¹⁵

To produce these feedstocks in the most sustainable manner, we are requesting that the CARB allow for Tier 2 pathways to credit climate-smart farming practices that enable feedstock to be produced in a less carbon intensive manner. Specifically, we are encouraging CARB to recognize within the next update of the CA-GREET model CI reductions in feedstocks that result from adoption of climate-smart agriculture practices. In addition, we encourage CARB to include allowing the crediting of higher yields than the defaults in the GREET calculator. We recommend that the total feedstock CI reduction for a qualifying fuel pathway be based on the aggregate net reduction achieved for all the farming practices as compared to the Tier 1 CA-GREET calculator standard value for these feedstock CI components.

Prioritize climate-smart agriculture in SAF requirements

Finally, we are asking the Board to direct staff to investigate how the agriculture sector can be optimized to produce low-carbon biofuels to meet the state's SAF goal. Specifically, we are requesting the Board to prioritize policy discussions and the associated technical analysis related to low-carbon feedstocks to produce Sustainable Aviation Fuels (SAF). This technical analysis should include a thorough lifecycle analysis to determine the extent to which supplies of sustainable biofuels produced from various feedstocks can be expanded while not converting additional land to agricultural uses. To ensure the timely analysis of this information, we request that the Board direct

¹³ RSB GHG Calculation Methodology v2.3 (2017). <https://rsb.org/wp-content/uploads/2020/06/RSB-STD-01-003-01-RSB-GHG-Calculation-Methodology-v2.3.pdf>

¹⁴ ISCC EU 205 Greenhouse Gas Emissions (2021). https://www.iscc-system.org/wp-content/uploads/2022/05/ISCC_EU_205_Greenhouse-Gas-Emissions-v4.0.pdf

¹⁵ CARB. (2024) California Low Carbon Fuel Standard Workshop. <https://ww2.arb.ca.gov/sites/default/files/2024-04/LCFS%20April%20Workshop%20Slides.pdf>

staff to report back to the Board by the end of 2025 on the results of lifecycle analysis and progress toward developing policies to encourage the production of SAF.

For the foreseeable future, liquid fuels will be required to power the majority of airflight thus necessitating a rapid expansion in the supply of SAF. In order to create demand for the fuels with the lowest actual CI possible, CARB needs to account for and incentivize climate-smart agricultural practices. Fortunately, the benefits of these sustainable agricultural practices go beyond their GHG savings, positively impacting our water, ecosystems, and soils.

CARB has been an international leader in developing and implementing programs to reduce GHG emissions across the California economy and the inclusion of climate-smart agricultural practices will continue the State's leadership throughout the country, especially in the Midwest where a large portion of the corn and soy are grown that support the LCFS. We thank CARB for this opportunity to offer these comments and look forward to continued collaboration to implement policies and strategies that further reduce emissions from the transportation sector.

Sincerely,



Christopher M. Malone
Vice President, Market Development
Indigo Ag



May 14, 2024

Ms. Liane Randolph
Chair, California Air Resources Board
1001 I Street Sacramento, CA 95814

Submitted Electronically

Re: Comments on April 10th CARB workshop regarding updates to the Low Carbon Fuel Standard program (Updated 5/14/2024 with aviation comments)

Dear Chair Randolph,

Environmental Defense Fund appreciates the opportunity to provide comments on the April 10, 2024, workshop regarding updates to California's Low Carbon Fuel Standard. We are grateful for the continuous work CARB staff have put in to update this program, and we look forward to continuing to engage in this rulemaking and supporting the successful decarbonization of California's transportation sector.

As we have stated in previous comments, updating LCFS to increase the program's ambition and efficacy will be integral to ensuring California can deliver the outcomes and emissions reductions envisioned in the final Climate Change Scoping Plan, as well as achieve carbon neutrality by 2045. We are pleased to see that CARB is committed to making this program more ambitious and support the strengthening of the CI reduction benchmarks both pre- and post-2030. This will be a critical step to ensure California can realize the full benefits of LCFS. To that end, we provide the following comments and recommendations regarding the proposed modifications to crediting for medium- and heavy-duty vehicles and sustainable decarbonization for the aviation sector.

1. Crediting for Medium- and Heavy-Duty Vehicle Charging

Medium- and heavy-duty vehicles are responsible for a disproportionate amount of greenhouse gas (GHG) emissions and local pollution relative to the size of their population. In California, despite the fact that trucks are just seven percent of all vehicles in the state, they emit nearly 33% percent of particulate matter, 25% percent of nitrogen oxides (NO_x), and nearly 9% percent of greenhouse gas emissions¹ from the transportation sector; electrifying these vehicles will therefore produce outsized climate and local air pollution benefits. This is particularly important in the state's disadvantaged communities, because while the health impacts, which can negatively affect "every organ in the body,"² are experienced to some extent

¹ <https://ww2.arb.ca.gov/ghg-inventory-graphs>

² <https://www.ucsusa.org/resources/cars-trucks-buses-and-air-pollution#toc-effects>

all across the state, “low-income and communities of color...are often disproportionately affected by emissions from freight movement due to their proximity to transportation infrastructure,”³ such as ports, railyards, and freight corridors. Because of this disproportionate impact, there is an urgent need to electrify medium- and heavy-duty vehicles in these neighborhoods.

The proposed expansion of the Clean Fuel Reward program and the introduction of the medium- and heavy-duty vehicle Fast Charging Infrastructure credit will further incentivize and streamline the adoption of medium- and heavy-duty electric vehicles and help California achieve the full benefits of the Advanced Clean Trucks and Advanced Clean Fleets rules.

As noted in previous comments, EDF supports the proposal to provide rebates for heavy-duty fleets under the Clean Fuel Reward program heavy-duty rebate. The focus on new and used rebates for medium- and heavy-duty trucks that are exempted from the Advanced Clean Fleets regulation will chart a path towards electrification for the segments of the trucking sector that are most challenging to transition. This program will be particularly important for small fleets and independent owners/operators, for whom up-front purchase price can be a major barrier to electrification.

Ensuring that there is adequate charging infrastructure is a crucial step to ensuring California can fully realize the benefits of the Advanced Clean Trucks and Advanced Clean Fleets rules. As such, EDF views the introduction of a new medium- and heavy-duty vehicle Fast Charging Infrastructure (MHD FCI) credit as critical for this effort. The operational variation of medium- and heavy-duty vehicles necessitates a wide diversity of charging equipment and capabilities. Given the diversity of charging needs, the 10 years of crediting will be one of many state-supported funding solutions necessary to transition fleets effectively and affordably throughout the state.

The LCFS will play an important role in helping the state meet its zero-emission transportation goals and successfully implement recent regulations. To optimize the program’s advantages, we respectfully make the following recommendations.

CARB should remove the minimum nameplate power rating requirement for the MHD FCI program.

EDF recommends that CARB modify the proposed eligibility requirements for participating in the MHD FCI program to remove the requirement that each charger (also referred to as Fueling Supply Equipment or FSE) “must have a minimum nameplate power rating of 250 kW.” While some electric trucks and buses will rely on direct current fast chargers (DCFCs) with nameplate capacities of 250 kW or greater, many will not need this level of charging. This is particularly true for fleets operating out of and charging at private depots which may have shorter duty cycles and can spread their charging overnight and/or several daytime blocks with lower-power DCFC or level-2 charging. Removing the 250 kW requirement would allow these fleets to optimize their charging based on their own operational needs, resulting in grid-beneficial charging behavior, while still remaining eligible for the program.

CARB should remove or modify the limitation that no more than ten chargers per applicant per site would be eligible for credits.

³ https://ww2.arb.ca.gov/sites/default/files/2021-09/Proposed_2020_Mobile_Source_Strategy.pdf

190.5
cont.

Consistent with this recommendation, CARB should also remove or modify the limitation that no more than ten chargers per applicant per site would be eligible for credits. The proposed 10 MW cap per customer per site is a sufficient constraint on individual customers accumulating credits while retaining the flexibility for applicants to deploy chargers in number and capacity consistent with their needs. Otherwise, applicants would potentially be incentivized to oversize chargers' nameplate capacity to maximize credit eligibility.

2. Sustainable Decarbonization of the Aviation Sector

For almost a decade, EDF has been working to reduce harmful pollution from aviation to mitigate climate change and deliver public health benefits by utilizing alternative fuels. This includes engagement in climate policy at the International Civil Aviation Organization (ICAO), leading and participating in expert working groups developing ICAO's Sustainability Framework for Sustainable Aviation Fuel (SAF) – an effort that builds heavily on California's Low Carbon Fuel Standard (LCFS). We were also deeply involved in the inclusion of SAF tax credits in the federal Inflation Reduction Act (IRA).

LCFS significantly impacts California's efforts to decarbonize the aviation sector and any proposed programmatic changes warrant thorough consideration. Expanding the scope of the Low Carbon Fuel Standard (LCFS) program to include aviation fuels beyond the existing voluntary opt-ins for alternative jet fuels⁴ is a necessary step towards achieving carbon neutrality in California by 2045 and will likewise support collective climate ambition. The structured deployment of sustainable aviation fuels (SAF) in California is crucial for the civil aviation sector to reach the International Civil Aviation Organization (ICAO)'s global goal of net-zero climate impact by 2050.

In light of federal preemption risks associated with intrastate flights, CARB should consider a “fall-off provision” with alternative coverage.

190.6

We are pleased to see CARB taking steps to sustainably transition from uptake of conventional fossil jet fuel to uptake of alternative jet fuel in California. However, the emphasis on intrastate flight coverage may trigger a legal dispute on the grounds of federal preemption, posing a tangible risk of invalidating CARB's intrastate aviation provisions. Therefore, EDF encourages CARB to consider proactively addressing this potential scenario by incorporating a “fall-off provision” to ensure at least an alternative measure applies in case the intrastate provisions are invalidated. This approach would increase the likelihood of successfully safeguarding CARB's efforts to regulate aviation emissions.

The following amendments to § 95482(b) provide an illustrative fall-off provision. The amendments, denoted by the red text, constrain the ability of alternative jet fuels to opt-in when their volumes exceed 500 million gallons of gasoline in a calendar year. If all provisions related to intrastate flights are invalidated, *all* fossil jet fuel and alternative jet fuel uplifted in California would be subject to the LCFS. To avoid changing the overall ambition of the program, a follow-up condition would ensure the intensity benchmarks for gasoline, diesel, and jet fuel are updated to target, in the aggregate, the same total absolute reductions that would have been achieved with the annual carbon intensity benchmarks set forth in sections 95484(d) through(f).

⁴ Important to note, ‘alternative jet fuels’ denotes a broader category than does ‘SAF.’ Per definitions established at the federal and international levels, ‘SAF’ refers solely to fuels produced using renewable energy sources, wastes and residues and meet sustainability criteria.

190.6
cont.

Section § 95482(b) “*Opt-In Fuels. Each of the following alternative fuels (“opt-in fuels”) is presumed to have a full fuel cycle, carbon intensity that meets the compliance schedules set forth in sections 95484, ~~(b)~~ (d) through ~~(d)~~ through December 31, ~~2030~~2045. A fuel provider for an alternative fuel listed below may generate LCFS credits for that fuel only by electing to opt into the LCFS as an opt-in fuel reporting entity pursuant to section 95483.1 and meeting the requirements of this regulation:*

(1) *Electricity;*

(2) *Bio-CNG;*

(3) *Bio-LNG;*

(4) *Bio-L-CNG;*

(5) *Alternative Jet Fuel, unless the volume of alternative jet fuel that opts-in is greater than 500 million gasoline gallon equivalent, in which case an updated set of annual carbon intensity benchmarks will be posted on May 15 of the following year the Executive Officer announces that that condition has been triggered. The updated intensity benchmarks for gasoline and fuels used as a substitute for gasoline, for diesel fuel and fuels used as a substitute for diesel fuel, and fossil jet fuel and fuels used as a substitute for fossil jet fuel will target in the aggregate the same total absolute reductions that would have been achieved with the annual carbon intensity benchmarks set forth in sections 95484(d) through(f); and*

(6) *Renewable Propane.*

Finally, 95484(f) needs to be corrected to include both fossil jet fuel and fuels used as a substitute for fossil jet fuel.

Thank you for your consideration of these comments. EDF looks forward to supporting the California Air Resource Board as it works toward transportation decarbonization, achieving net-zero greenhouse gas emissions by 2045, and delivering long-overdue environmental justice for local communities and their right to breathe clean air. If you have questions or would like to discuss any of these recommendations, please contact Katelyn Roedner Sutter at kroedner@edf.org.

Sincerely,



Katelyn Roedner Sutter
California State Director



Pedro Piris Cabezas, Ph.D.
Senior Director, Global Transportation / Lead Senior Economist



Sara Noelani Olsen
Project Manager, California Political Affairs

May 10, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95815

RE: Proposed Low Carbon Fuel Standard Amendments, Post Workshop Comments

Dear California Air Resources Board Members and Staff,

Thank you for the opportunity to provide our comments and recommendations on the proposed Low Carbon Fuel Standard (LCFS) Amendments. Several members of our coalition participated in the April 10, 2024 workshop and we greatly appreciated the opportunity for stakeholder questions and comments. We also appreciated positive comments from staff with regard to some of our recommendations around program flexibilities that can help achieve state goals. We provide the following written comments as a follow-up to the workshop to respond to outstanding questions and highlight additional information not included in our initial written comments.

The undersigned Joint MHD EV Infrastructure Parties develop multi-fleet EV charging hubs that provide third-party owned charging-as-a-service to medium and heavy duty (MHD) EV fleet owners. The signatories represent a sizable share of charging depots under development in the state.

As a preliminary matter, we reiterate that the Low Carbon Fuel Standard is one of the most important tools in supporting a transition to zero emission vehicles and a critical mechanism to achieve California EO-N-79-20 which first set the state's target for 100% electrification of fleets by 2045. Over the past 10 years, the LCFS has spurred the transition from petroleum to electricity, reducing greenhouse gas emissions and a myriad of air and toxic pollutants that disproportionately impact low-income and disadvantaged communities. CARB's 2022 Scoping Plan Update relies on the support for electrification that will be funded by the LCFS. As we stated in our initial 45-day comments, we strongly support the LCFS program and see tremendous potential to better align the program to support electrification in the MHD space. However, we believe that reforming the program with the recommendations we provide below will ensure that the LCFS program best supports the State's electrification goals, including and especially Advanced Clean Fleets and Advanced Clean Trucks regulations.

We appreciate the presentation made by staff at the April 10th workshop and the opportunity for additional collaboration and dialogue with CARB staff and interested stakeholders. We would like to take this opportunity to reiterate our 45-day comments, which we have attached as Appendix-1, in light of some of the feedback provided at the workshop.

Our 45-day comments from February 20, 2024, had two main recommendations: A) to address problematic restrictions on the proposed capacity crediting program for the medium and heavy duty (MHD) sector; and B) strengthen and update the overall LCFS program to better support zero emission fuels in order to achieve the state's ZEV goals. These recommendations are intended to ensure that the LCFS regulation is structured in a manner that is flexible enough to support both the market and technology innovations needed to achieve the state's M/HD fleet and infrastructure goals.

A) Address Problematic Restrictions on Capacity Crediting Program (FCI)

We'd like to once again thank CARB staff for their proposal to expand the capacity crediting program (known as Fast Charging Infrastructure, or FCI) to MHD infrastructure. The FCI program is an elegant solution to the chicken and egg issue the EV industry has long grappled with. Expanding the FCI program is one of the most helpful

things that policymakers can do to accelerate deployment of charging infrastructure in advance of vehicle deployment, laying the groundwork for an accelerated transition to zero emission vehicles.

191.3

However, CARB's current proposal will not be effective in supporting electrification. It contains several restrictions that do not adequately consider the constraints on the grid, the needs of freight businesses, and the variety of approaches necessary to serve fleet electrification across use cases. While we appreciate staff's willingness to engage in dialogue, we believe that our recommendations must be adopted if the FCI program is to support the state's electrification goals.

We also appreciate the support of numerous environmental and environmental justice organizations, as well as other charging industry organizations, both in the February 20th filings, and in the April 10 workshop, who echoed our points, and were pleased to note that we are not aware of any recorded opposition to our recommendations. We provide collated excerpts of supportive positions from these organizations in Appendix 2 of our comments.

We provide additional comments to each element as follows:

1. ***Eliminate or expand geographic limitations on MHD-FCI eligibility to improve program effectiveness, better align with fleet needs, mitigate delays, and reduce overall costs.***

There are at least three main reasons to eliminate or expand the geographic limitations: (1) to to expand siting opportunities in recognition of overlapping grid constraints, operational needs, and land use considerations, (2) to provide a full ecosystem of charging opportunities, from origin to destination, to better support emissions reductions even in the most heavily trafficked areas, and (3) to better align with and support CARB's statewide ACF regulation.

We appreciate that CARB has a desire to ensure that the most heavily trafficked corridors in the state - and the areas with the heaviest concentration of emission exposure to communities - are the focal point for a transition to zero emission trucks. We respond by pointing out that market dynamics and operational considerations will already funnel charging to high-traffic locations near freight hubs and corridors; no additional requirements are needed. Secondly, successful electrification will require broad availability of charging infrastructure at hubs, at destinations, and along connecting corridors - a full ecosystem is necessary.

Since the release of the staff proposal, the Joint Office of Energy and Transportation released a National Zero-Emission Freight Corridor Strategy intended to drive alignment on infrastructure deployment. The "Strategy identifies the greatest opportunities to support early introduction of ZE-MHDVs, promoting cost savings for commercial fleets, cleaner air for communities, and strategic investments for infrastructure companies and electric utilities." Phase one focuses on building out the charging ecosystem in key freight hubs, and the focus branches out along key connecting corridors in future phases. Additional siting flexibility would allow industry to better align with this national strategy and, ultimately, accelerate widespread electrification with the greatest benefits accruing to those regions suffering most from diesel pollution today. The local air quality benefits will be driven by the pace and scale of electrification in the area, regardless of the exact locations of the chargers.

A closer look at one of the state's most heavily impacted regions for goods movement illustrates the need for more flexibility. The Los Angeles Cleantech Incubator (LACI) released a report last year on "Heavy-Duty Charging to Support Battery-Electric Drayage Along the I-710 Corridor." This analysis considered potential locations for truck charging in the region, and many of the locations highlighted in the report as potential truck charging sites fall outside of the one-mile boundary. This example underscores the need for greater flexibility to meet fleet

needs and accelerate electrification. We see a similar situation in other freight hotspots and hubs around the state (e.g., the Inland Empire region in Southern California or the Stockton region in Northern California).

We acknowledge and appreciate staff's proposal to include sites with overnight truck parking, even if they fall outside of the one-mile corridor boundary. This is helpful but not sufficient if it is limited to current sites. Grid constraints and landlord restrictions are well-known barriers to electrification at many existing sites, and these issues are one key reason why multi-fleet depots are an important piece of the overall charging ecosystem. Moreover, fleets will face new operational considerations as they electrify, meaning that locations and operations will be in flux during this transition.

With regard to grid constraints and implications for project costs and timelines, we would like to call attention to comments at the April 10 workshop from Southern California Edison (SCE). Specifically, SCE called for increased geographic siting flexibility in order to take advantage of available grid capacity and avoid creating undue cost and delay in the deployment of MHD charging infrastructure. This is a critically important and high-profile issue on multiple fronts. Utility upgrade timelines and resulting project delays were the subject of legislation in 2023 and there is an ongoing proceeding now at the California Public Utilities Commission focusing in part on upgrade timelines and the impact that delays have on CARB's ACT and ACF programs. Additionally, inefficient siting and resulting upgrades will continue to put upward pressure on electricity rates, exacerbating an energy affordability issue for California ratepayers. Increased flexibility will allow us to electrify faster, and at lower cost, with widespread benefits for all.

We recognize that there has been a focus in the light duty passenger vehicle sector on locating charging within a mile of a major corridor. However, it is important to acknowledge the differences in customer needs and site specifications. Light duty passenger vehicle charging on corridors requires quick access on and off freeways and a much lower amount of overall power at the site. A one-mile requirement, as required in the federal NEVI program as well as previous LDV corridor charging programs funded by the CEC Clean Transportation Program, is therefore more suitable for light duty charging. For commercial trucks, the operational needs of fleets and the grid constraints inherent in multi-megawatt sites call for more flexibility.

As aforementioned, we greatly appreciate staff's willingness to continue to have a meaningful dialogue via this additional workshop. We appreciate this openness and reiterate our position that the best outcome would be the complete removal of geographic limitations, followed by an expansion of the 1 mile limit to at least 5 miles. This position has broad support among environmental stakeholders, as outlined in Appendix 2.

2. *Eliminate the 10 FSE per-site cap to enable the scale necessary to meet state goals and to encourage cost reductions that come with upfront investments and scale.*

We reiterate that capping the number of chargers per site will result in increased costs and reduced access to charging infrastructure, particularly for smaller fleets that are less likely to have the resources for dedicated behind-the-fence charging. Additional rationale and justification for this recommendation is included in our earlier comments, attached at Appendix 1. Prominent environmental groups (e.g., NRDC and the Union of Concerned Scientists) also called in written comments for the elimination of this 10 FSE cap.

We ask that this restriction be completely removed. If the goal is to ensure that there are a variety of market participants and a diversity of locations, the proposed cap of 10 MW per site is sufficient to achieve that outcome without layering on additional restrictions on the number of chargers.

3. *Eliminate the 250kW minimum capacity to enable infrastructure providers to provide the variety of solutions the market needs.*

191.5 As discussed in our prior written comments and at the workshop, the MHD sector is very different from the Light Duty sector, both in operational requirements and base access to charging. For LD, the basic premise is that most charging will occur at home, and public charging is needed either for fast recharges on road trips, or fast charging for those that are unable to charge at home. For MHD, however, the vast majority of charging will occur at depots. Fleets that have long dwell times, such as overnight, can use slow chargers which are less costly and have a smaller impact on the grid. Additionally, intermittently slow charging helps maintain battery health.

We are not aware of any stakeholders encouraging a 250kW minimum, and we note that others (e.g., EDF) also called for increased flexibility. We recommend leaving site specifications to the market.

4. Clarify rules around access requirements for shared depots to avoid creating confusion around eligibility requirements

191.6 As detailed in our previous comments, we recommend clarifying edits around access requirements and restrictions for multi-fleet charging hubs to avoid confusion. For suggested regulatory text edits, please see our earlier comments attached as Appendix 1. We are not aware of any stakeholder opposition or discussion at the workshop and have nothing new to add at this time.

5. Increase overall MHD-FCI program size to enable infrastructure deployment at the scale and pace required to meet California state goals

191.7 As detailed in our previous comments, we recommend increasing the program cap from 2.5% to 5% of previous quarter deficits to better align with state goals and infrastructure needs assessments. CEC analysis suggests the state will need 11.6 GW of charging for the MHD sector by 2030, and this scale of investment will require strong market signals. We also note that other stakeholders (e.g., NRDC and Earthjustice) made similar recommendations in their last written comments.

B) Strengthen and update the overall LCFS program to better support zero emission fuels in order to achieve the state's ZEV goals

The transition to zero emission freight needs to be economical in order to happen both rapidly and successfully. While California's Advanced Clean Trucks and Advanced Clean Fleets regulations mandate a transition to zero emission vehicles, neither of these landmark regulations address infrastructure needs. Actually achieving the transition depends on many individual stakeholders making large investments in vehicles and fueling infrastructure. These investments hinge on the ability of ZEVs to compete economically and operationally with diesel and gas.

191.8 The LCFS program can be an incredibly helpful tool to support the transition to ZEVs. For infrastructure developers, higher credit prices will enable accelerated deployment by attracting investment and improving project viability. Indeed, in slides presented at the April 10 workshop with a focus on infrastructure buildout, calculations referenced a period in which the LCFS credit prices were roughly 3x higher than they are today. For fleets and owner-operators, diesel cost parity is highly dependent on LCFS credit values. When CARB prepared its TCO analysis for ACF, it modeled credit values of \$200 through 2030. The delta between \$200 and today's credit prices represents over \$1,000 per month in increased fuel costs for the average drayage driver of a class 8 BEV daycab.

We encourage CARB to ensure that LCFS program updates support the market. LCFS market traders have not reacted favorably to CARB's proposals, either the December ISOR or the additional proposals floated at the April 10 workshop. In fact, the market dropped ~5% the day after the April 10 workshop, and remains at recent

191.8
cont.

historical lows as of today, below \$60 a credit. Credit prices at these depressed levels will hinder California's ability to meet its ambitious climate and clean air goals for the transportation sector. As outlined in our earlier comments and addressed in much greater detail by other stakeholders, CARB has multiple options for addressing the credit oversupply and market imbalance in today's market. We encourage staff to consider these issues, and the many comments to date on this topic, when deciding on stringency and eligibility provisions.

We thank CARB staff for facilitating a robust stakeholder engagement process and want to acknowledge the success of the LCFS program in California. LCFS has been an incredibly valuable tool for electrification, and it has great potential to help the state meet ambitious goals for this sector. However, it is imperative that we enact these changes to ensure the success of both the program's future and the electrification of the MHD vehicle sector. For additional details and rationale, please reference our earlier 45-day comments, provided as Appendix 1, as well the selected comments from other stakeholders identified in Appendix 2.

We thank you for your efforts and are happy to follow up with you or CARB staff at any time.

Yours,

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APPENDIX 1

Joint MHD EV Infrastructure Parties 45-Day Comments filed February 20, 2024

February 20, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95815

RE: Proposed Low Carbon Fuel Standard Amendments

Dear California Air Resources Board Members and Staff,

Thank you for the opportunity to provide our comments and recommendations on the proposed Low Carbon Fuel Standard (LCFS) Amendments. We greatly appreciate the California Air Resources Board's (CARB) leadership in supporting and accelerating the transition to zero emission freight. California has led the way on cleaning up the transportation sector by designing and implementing a comprehensive suite of policies to address this multi-faceted challenge, including both sticks and carrots to increase vehicle supply, boost demand, and facilitate infrastructure deployment and grid integration. LCFS is a critical piece of this overall puzzle in terms of incentivizing infrastructure buildout and improving the total cost of ownership for electric vehicles, particularly for the medium- and heavy-duty vehicle sector.

The undersigned Joint MHD EV Infrastructure Parties develop single and multi-fleet EV charging hubs that provide third-party owned charging-as-a-service to medium and heavy duty (MHD) EV fleet owners. Multi-fleet EV charging hubs are especially important for enabling small (and many large) businesses without adequate onsite charging capability to electrify their fleet vehicles to reduce costs, improve employee and community health and achieve California policy goals for clean vehicle deployment and decarbonization. Multi-fleet EV charging hubs provide the added benefit of increasing charging infrastructure utilization, enabling more vehicles to charge per charger without triggering costly system upgrades, thereby reducing the overall cost for all utility ratepayers. Our collective business models foster the concentration of electrical loads in strategically chosen locations, facilitating a more seamless transition to MHD EVs for commercial fleets.

With critical adjustments, LCFS has the potential to be the single most important tool in helping the state meet its zero emission transportation goals and recent regulations – the Advanced Clean Trucks (ACT) and Advanced Clean Fleets (ACF) regulations in particular. We appreciate CARB staff's collaboration to date on the provisions most relevant to our businesses, particularly with regard to the MHD Fast Charging Infrastructure (MHD-FCI) provision. We strongly support the creation of the MHD-FCI program, though additional modifications are needed to maximize the clean air and climate benefits it can unlock. We also applaud staff for recognizing the need for program stringency updates to support credit prices as a robust market is needed for LCFS to truly catalyze private investment.

Appendix 1

To fully realize the potential benefits of LCFS for truck electrification, we respectfully make the following recommendations.

6. **Maximize the benefits of the proposed medium- and heavy-duty fast charging infrastructure (MHD-FCI) program by increasing flexibility to better support the deployment of necessary charging infrastructure** in advance of truck deployment at the speed and scale to meet California's policy goals and regulations (e.g. CARB's recent Advanced Clean Fleets)
 - A. **Eliminate geographic limitations** on MHD-FCI eligibility to improve program effectiveness, better align with fleet needs, mitigate delays, and reduce overall costs.
 - B. **Eliminate the 10 FSE per-site cap** to enable the scale necessary to meet state goals and to encourage cost reductions that come with upfront investments and larger projects.
 - C. **Eliminate or reduce the 250kW minimum capacity** to enable infrastructure providers to provide the variety of solutions the market needs.
 - D. **Clarify rules around access requirements** for shared depots to avoid creating confusion around eligibility requirements.
 - E. **Increase overall MHD-FCI program size** to enable infrastructure deployment at the scale and pace required to meet California state goals.
7. **Strengthen and update the overall LCFS program to better align with long-term state goals and ambitions** by implementing changes that support credit prices.

We understand the board vote has been postponed to allow more time for consideration of potential program modifications, including some of what we outline above. We acknowledge the need for additional discussion, but also urge the board to move quickly with a decision in Q2 of this year. Market participants, including infrastructure providers, need certainty around program details and a lengthy delay will chill investment. Additional details and rationale for our highest priority recommendations can be found below.

1. **Maximize the benefits of the proposed medium- and heavy-duty fast charging infrastructure (MHD-FCI) program by increasing flexibility to better support the deployment of necessary charging infrastructure.**

At this early stage of the market, with under 1,000 medium- and heavy-duty electric trucks and vans on California roads based on recent data^[1], the uncertainty around truck charger utilization in the near term creates a risk that many would-be infrastructure investors are unwilling to take. The result is a lack of sufficient investment in large scale charging for electric trucks, and this in turn is slowing the deployment of the electric trucks. The Fast-Charging Infrastructure (FCI) program has already proven to be an elegant and effective way to overcome this fundamental challenge, and we deeply appreciate CARB's proposal to add an FCI for the MHD sector (MHD-FCI) and the efforts to date to include multi-fleet charging hubs in program design.

With critical adjustments, MHD-FCI could be the single most powerful tool for attracting private capital to this sector, accelerating the rollout of charging infrastructure ahead of vehicle deployment. MHD-FCI has the

Appendix 1

potential to provide some certainty around revenue, thereby de-risking these projects and attracting private investment. The key is to design a program that is sufficiently robust and flexible to match California's clean air and climate ambitions. This is a unique opportunity to catalyze deployment of truck charging infrastructure just when it is needed most to support the state's clean truck regulations and programs. The draft proposal has laid the foundation for a strong program. With a few key modifications, MHD-FCI can deliver widespread health, air quality, and climate benefits while attracting private investment to a sector that will need it to scale up to meet the State's goals.

A. Eliminate geographic limitations on MHD-FCI eligibility to improve program effectiveness, better align with fleet needs, mitigate delays, and reduce overall costs, for both Private and Shared MHD-FCI charging site types.

Section § 95486.3 outlines MHD-FCI eligibility requirements, including the following: *“Located within one mile of a reading or pending electric vehicle Federal Highway Administration Alternative Fuel Corridor or on or adjacent to a property used for medium or heavy-duty vehicle overnight parking, or has received capital funding from a State or Federal competitive grant program that includes location evaluation as criteria.”* We recommend removing these geographic restrictions entirely as they will undercut program effectiveness, delay deployment, and increase costs for charging and grid upgrades for MHD-FCI Shared charging sites, and are also irrelevant to the MHD-FCI Private charging sites category; public navigability and accessibility are not merits of an MHD-FCI Private charging site that is by definition precisely on route for the associated Private fleet.

Corridor charging does not address operational needs for many high-priority market segments. While corridor-based charging may be part of the solution for long-haul trucking, it does not align well with the duty cycles and day-to-day operations of short haul and return-to-base fleets such as drayage, middle mile, and last mile delivery. These are the vehicles that are expected to electrify first due to ACF regulations and the overall “fit” of battery electric vehicle technology today. These vehicles would benefit from charging in areas where they operate and where they are domiciled, and these locations do not necessarily fall within one mile of a corridor. Additional flexibility is needed to meet needs for the broader MHD sector, beyond just long-haul applications, and to serve the market segments most ripe for rapid decarbonization.

Focusing the program on corridors also inadequately considers grid constraints and the implications that this may have on fleet electrification. Depots will generally have large power demands (often 5-15MW). Land with access to sufficient grid capacity on distribution feeders is very limited, and the number of suitable sites shrinks even further when factoring in zoning, permitting, and ingress/egress requirements. The proposed one-mile restriction would not only further limit where MHD charging can occur but also funnel depots to areas that would necessitate costly and lengthy grid upgrades – with the unfortunate consequence of slowing down charging infrastructure deployment and potentially increasing electric rates for all Californians. Additional flexibility is needed to account for the constraints on our grid and to facilitate timely, cost-effective infrastructure buildout.

Appendix 1

The proposed program does include language allowing eligibility for sites adjacent to overnight parking and sites that have received certain state or federal funds. While we appreciate these provisions and they are directionally helpful, this language is still far too limiting. The language around existing parking does not account for grid constraints or for the fact that fleet operations are evolving and parking locations will not be static, particularly given the challenges associated with infrastructure deployment (e.g., grid constraints, landlord restrictions, etc.). Indeed, greenfield sites with overnight parking should not be excluded just because they are not currently providing truck parking. With regard to allowing MHD-FCI for sites that have won competitive grant solicitations, we appreciate the intention but note that (a) funding is limited and budgets are under pressure, so this is a relatively small number of sites, and (b) local funding appears to be excluded despite the fact that many local air districts have programs aimed at MHD-fleet electrification.

We recommend completely eliminating geographic restrictions in order to maximize the benefits of the program. Business models, amount of investment needed to build charging sites, and investor pressures will minimize the risk of stranded assets and ensure that charger deployments align with fleet operational needs for both Shared and Private charging sites in a network. If CARB ultimately decides that limits are needed, we recommend specific changes to provide added flexibility, open up additional sites, and avoid unintentional delays and potential cost increases.

- **Recommendation: Strike section §95486.3 (b)(1)(B)2** to provide implementation flexibility. This is the best course of action to accelerate progress on electrification and to avoid unintended consequences.
- **Suboptimal alternative:** We maintain that a program without geographic limits would best serve CARB goals and that limits are unnecessary given the natural market forces that will push for optimized locations. If, however, CARB determines that some geographic limits are necessary for shared charging sites, we suggest increasing flexibility with the following changes to existing language to address corridor distance, the realities of parking and fleet operations, and the importance of local decision-making in this sector:
 - ~~2. located within one mile five miles of a readying or pending electric vehicle Federal Highway Administration Alternative Fuel Corridor or on or adjacent to a property that allows used for medium or heavy-duty vehicle overnight parking at the time credits are claimed, or has received capital funding from a local, State or Federal competitive grant program. that includes location evaluation as criteria~~

B. Eliminate the 10 FSE per-site cap to enable the scale necessary to meet state goals and to encourage cost reductions that come with upfront investments and scale.

Section §95486.3 states “The total number for all FSEs claiming MHDFCI credit owned by a single applicant within ¼ mile of an MHD-FCI site cannot exceed ten.” Limiting eligibility to 10 FSEs per site would severely restrict program effectiveness, and would hamstring the ability for charging infrastructure to be deployed at the speed and scale required by the Advanced Clean Fleets and Advanced Clean Trucks regulations.

Our companies are developing depots of various sizes, including within the 100-truck range, as depots of this size have the scale to bring down costs for customers. The purpose of the FCI program is to encourage the

Appendix 1

deployment of charging infrastructure in advance of truck availability by providing bridge revenue as truck deployments ramp up. Limiting participation to a small proportion of a site's chargers – in many instances a 90% reduction -- would make the program ineffective for these depots. With this restriction, the program would perversely only support the sites with higher per-port costs – which is not in California's best interests.

According to CEC analysis, we estimate that California must install an average of approximately 66 MHD chargers a day through 2035^[2]. This is an astronomical rate of growth, and the FCI is an elegant tool to help achieve that. Limiting the eligible number of chargers in a depot would be catastrophic to our efforts to meet the scale and scope of infrastructure deployment required by CARB regulation.

Given other provisions in the draft language, we believe it has been suggested that the intention behind the 10 FSE per site limit may be to force 1 MW chargers. If so, there are multiple reasons to reconsider. First, not all customers and use cases require megawatt charging, and there are cost tradeoffs with higher power charging. Secondly, there are also grid benefits to lower power charging -- maximizing the utilization of the existing distribution network thereby minimizes potential rate impacts. Thirdly, 1 MW chargers do not yet exist at broad commercial scale. Finally, there are no trucks currently commercially available that can take 1 MW; though some MW+ models are being developed, they are not expected to be commercially available at scale for some time.

Finally, as noted above, the proposed amendments also include a limit on individual entities claiming credits beyond 10 MW of nameplate charger capacity within ¼ of that entity's site. This overall site claiming capacity limit is sufficient to ensure a diversity of sites and applicants; there is no need for a separate FSE cap.

- **Recommendation: Eliminate the 10 FSE per site limit by striking section §95486.3(b)(2)(D)** to enable the scale necessary to meet state goals and to encourage cost reductions that come with upfront investments and larger projects. The 10 MW overall site claiming capacity limit is sufficient to meet policy objectives.

C. Eliminate or reduce the 250kW minimum capacity to enable infrastructure providers to provide the variety of solutions the market needs.

Section §95486.3 creates a minimum per-FSE power rating threshold: *"Each FSE at an MHD-FCI site must have a minimum nameplate power rating of 250 kW."* This is unnecessary and should be either removed or reduced.

The state has a policy interest in having vehicles charged as "low and slow" as possible. Lower power charging will maximize utilization of the existing distribution network, putting downward pressure on rates. For light duty vehicles, for example, home charging is encouraged at L1 and L2 levels. In the MHD sector, many trucks are not able to charge 'at home', as where they are domiciled may not have sufficient hosting capacity to serve the massive amounts of power that a fleet of trucks with very large batteries need, and small operators often do not own property or have long term leases sufficient to amortize the high costs of installing chargers. In these instances, 3rd party depots play the role of both 'home charging' (i.e. overnight dwell) and pulling into a DCFC on a highway for a mid-route refill.

Appendix 1

There is a tradeoff between the speed of charging and the cost to serve the massive numbers of vehicles that must be electrified, and artificially biasing the market toward higher power charging through size minimums for all use cases will both increase costs and grid impacts. This is why many 3rd party depots are designed with a mix of fast opportunity chargers and slower (and cheaper) overnight or long dwell chargers - to have a mix of technologies aligned to varying use cases, designed to keep costs as low as possible while meeting a range of needs. We believe that the market can and should decide on the appropriate power levels for depot charging. Further, this is a matter of equity, as the entities that will be most impacted by the higher costs are the less-well-capitalized fleets and drivers that cannot charge 'at home' and must rely on 3rd party depots.

- **Recommendation:** Eliminate the 250kW minimum by striking section §95486.3(b)(1)(E) to allow greater flexibility on site design and cost control. If CARB sees a need for a minimum to focus on fast charging, establish 150kW as the minimum nameplate power rating.

D. Clarify rules around access requirements for shared depots to avoid creating confusion around eligibility requirements.

Appendix A-1 defines "shared MHD-FCI charging site" as "...an EV fast charging site that is available to at least two MHD EV fleets under different ownership, or to the public for at least 12 hours each day..." and states that "The site must not have obstructions or obstacles precluding the fleet vehicles from entering site premises, and no registered equipment training shall be required for individuals to use the site." It is our understanding that CARB intends to allow shared depot charging, which we strongly support. These sites generally will have security measures (e.g., security fencing and access control) to ensure safety of vehicles and cargo and to ensure access to customers from multiple authorized fleets. These sorts of standard security measures should not be considered obstacles. We recommend clarifying language to align with market needs and eliminate any future questions around eligibility.

- **Recommendation:** Clarify the definition of shared MHD-FCI charging site to remove uncertainty around security measures at shared depot sites. Suggested language: "'Shared MHD-FCI charging site' means an EV fast charging site that is available to at least two MHD EV fleets under different ownership, or to the public for at least 12 hours each day. ~~The site must not have obstructions or~~ Access controls and security measures are allowed so long as there are no obstacles precluding the authorized fleet vehicles from entering site premises, and no registered equipment training shall be required for individuals to use the site."

E. Increase overall MHD-FCI program size to enable infrastructure deployment at the scale and pace required to meet California state goals.

The MHD-FCI program is limited to 2.5% of the previous quarter deficits. At 2025 deficit levels, we estimate this would support as little as 635 MW of MHD charging capacity, increasing as utilization ramps up over time.^[3] According to the CEC's AB 2127 analysis, the state will need about 2,900 MW of MHD charging by 2025 and 11.6 GW of MHD charging by 2030.^[4] Additional support is needed to attract the scale of private capital required,

particularly at this nascent stage of the market with uncertainty around commercial-scale truck deployment timelines and with both fleets and OEMs citing infrastructure as a primary limiting factor.

- **Recommendation: Increase the program cap from 2.5% to 5%.** We are at a critical launch point for both ACT and ACF and believe a higher cap – we recommend at least 5% - is warranted to begin deploying a network that will enable the market to take off. As momentum builds and the on-road electric truck population grows, CARB might consider reducing the cap.

2. Strengthen and update the overall LCFS program to better align with long-term state goals and ambitions.

LCFS has played a critical role in reducing transportation-related emissions in California since its inception. However, the market has become imbalanced in recent years, credit prices have fallen precipitously, and the program is beginning to diverge from California’s longer term market transformation goals for the transportation sector.

From our standpoint as a group of companies interested in rapid and widespread electrification, the primary overarching issue with the LCFS market is that historically low credit prices are undermining investor confidence in the market. When CARB prepared its TCO analysis for ACF, it modeled credit values of \$200 through 2030^[5] – but credit values have plummeted to around \$60^[6] and the market has not reacted positively to the most recent proposed language. CARB is proposing multiple regulatory changes to begin addressing the challenges undercutting this market, including a proposal to step down program stringency in 2025 as well as the creation of Automatic Acceleration Mechanism. We generally support these provisions and appreciate the recognition that both are necessary given recent market dynamics. However, despite these proposals, we have not yet identified any analysts or brokers who see a near-term rebound in credit prices absent additional changes to the proposed regulation.

- **Recommendation: Additional program modifications are needed to support credit prices and drive innovation and investment that supports California state goals.** CARB has multiple options to support credit prices:
 - Some fuel sector experts and advocates have called for **further increases in stringency and earlier implementation of the Automatic Acceleration Mechanism** as one way to address the oversupply issues undercutting the market.
 - Many environmental advocates and community-based organizations are calling for **caps on certain crop-based biofuels** and as an important part of the solution.^[7]

We recognize that this is a complicated topic with many details falling outside of our core area of expertise. Others are better positioned to weigh in on expected renewable fuel volumes, land use change, and localized health impacts. It is clear that additional program changes are needed to address the supply/demand imbalance that is undercutting credit prices and we believe there is value in better aligning this policy with California’s goal of a zero-emission transportation sector.

Appendix 1

California continues to play a leadership role in reducing emissions, improving air quality, and supporting private sector innovation through strong market signals. The state has set very ambitious targets and timelines for electrifying medium- and heavy-duty vehicles, calling for a complete market transformation that will require massive investment, cross-sector collaboration, and forward-looking policy intervention. Companies like ours are stepping in to help achieve our shared goals, but infrastructure investment on the scale we need to see has not yet materialized. **With the modifications outlined above, LCFS can be the single most powerful tool California has to attract the private capital needed to build out truck charging infrastructure.** LCFS is one of the few remaining tools California has to drive investment in charging infrastructure with looming budget deficits and a crisis of rising electricity rates. We must not miss this opportunity to better align LCFS with California's goals.

We thank you for your efforts and are happy to follow up with you or CARB staff at any time.

Yours,

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Appendix 1

[1] California Energy Commission [Medium- and Heavy-Duty Zero-Emission Vehicles in California](#). As of the end of 2022, the total medium- and heavy-duty ZEV population in California included 272 trucks and 340 vans.

[2] This calculation is based on the CEC AB 2127 report:

[Assembly Bill 2127 Second Electric Vehicle Charging Infrastructure Assessment: Assessing Charging Needs to Support Zero-Emission Vehicles in 2030 and 2035 | California Energy Commission](#). To support medium- and heavy-duty plug-in electric vehicles, California will need about 109,000 depot chargers and 5,500 public chargers for 155,000 vehicles in 2030, and 256,000 depot chargers and 8,500 public chargers for 377,000 vehicles in 2035.

[3] This calculation was derived leveraging the formulas from Appendix A-2 Proposed Regulation Order, section § 95486.3.(b)(2)(G) and section § 95486.3.(b)(5)(G) with the following assumptions: previous quarter deficits = 8,082,115 MT (based on CARB CATS model 2025 forecast); shared MHD-FCI charging site model selection; 85% uptime; and 5% utilization. Supported capacity will vary with utilization, uptime, and other assumptions.

[4] The California Energy Commission's AB 2127 report uses the HEVI-load model to forecast the number of depot and public chargers required for MHD charging under the AATE3 primary scenario. This forecast predicts the number of chargers and their respective power ratings that will be required in 2025 and 2030, as seen in Appendix-H, Table H-1. The sum of the total MHD charging capacity based on this forecast was calculated to be 2,900 MW and 11,600 MW by 2025 and 2030, respectively, by taking the sum-product of the number of chargers and their respective power rating.

[5] Appendix G of ACF regulation, p. 21, accessed at:

<https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/acf22/appg.pdf>

[6] [Weekly LCFS Credit Transfer Activity Reports | California Air Resources Board](#). The average for February 5th-11th was \$60.52.

[7] For example, see "Assembly Bill 32 Environmental Justice Advisory Committee (EJAC) DRAFT Recommendations to the California Air Resources Board (CARB) on the Low Carbon Fuel Standard Regulation Updates" (available online at [1-lcfs2024-VjMFaQNjUGABWFA0.pdf \(ca.gov\)](#)) as well as comments submitted by the World Resources Institute (WRI) and others.

APPENDIX 2

Stakeholder Support for Joint MHD EV Infrastructure Parties Recommendations for LCFS Reform: Summary and Selected Quotes

Below are selected quotes from other stakeholders on the issues highlighted in our comments. This is not intended to be an exhaustive list, and nor is it a full summary of any stakeholder's comments, as we do not intend to speak for other parties. Emphasis added.

Comments from Nonprofit Environmental Organizations

Coalition for Clean Air recommended removing geographic restrictions.

- “CARB regulations, which we support, require a transition to zero-emission engines in buses, trucks and other medium and heavy-duty vehicles. That transition is essential to solving our air pollution and climate crises, and infrastructure challenges are probably the biggest single obstacle to success. Therefore, we support the proposed creation of an infrastructure crediting mechanism for medium and heavy-duty refueling for zero-emission vehicles, both battery-electric and fuel-cell electric.
- But the success of the MHD-FCI provision will be constrained by the geographic limitation...**We recommend removing these geographic restrictions**, as they will undercut program effectiveness, delay deployment, and increase costs for charging and grid upgrades.”

Earthjustice recommended suggested eliminating geographic restrictions and increasing the overall program cap to 5%

- **“Eliminate the geographic restrictions, which will add administrative burden and unnecessarily exclude sites with high potential to electrify earlier** than longer haul routes that would be operating along these corridors. Local and regional fleets will not necessarily charge near these corridors but are highly suitable to early electrification, and the LCFS should help enable operators to overcome one of the few remaining barriers to getting their fleets off diesel. Orienting the capacity credits only toward longer-hauls and limiting to freight corridors missed the opportunity to accelerate near-term action. **It is also unclear why this provision is necessary**, since Earthjustice has not seen information that suggests an overbuilding of medium-and heavy-duty charging stations. **Charging providers already have a fundamental incentive to cite stations as conveniently as possible for fleets that are interested in electrifying.**”
- **Increase capacity credits to 5% of prior quarter deficits.** Currently, the language appears to suggest that both kinds of stations will cumulatively share the 2.5% of prior quarter deficits. This should be increased to 5% each to enable larger capacity charging deployments

EDF recommended removing the 250kW minimum threshold and 10 FSE per site cap.

- “EDF recommends that CARB modify the proposed eligibility requirements for participating in the MHD FCI program to **remove the requirement that each charger (also referred to as Fueling Supply Equipment or FSE) “must have a minimum nameplate power rating of 250 kW.”** While some electric trucks and buses will rely on direct current fast chargers (DCFCs) with nameplate capacities of 250 kW or greater, many will not need this level of charging. This is particularly true for fleets operating out of and charging at private depots which may have shorter duty cycles and can spread their charging overnight and/or several daytime blocks with lower-power DCFC or level-2 charging. Removing the 250 kW requirement would allow these fleets to optimize their charging based on their own operational needs, resulting in grid-beneficial charging behavior, while still remaining eligible for the program.”

Appendix 2

- “Consistent with this recommendation, **CARB should also remove or modify the limitation that no more than ten chargers per applicant per site would be eligible for credits.** The proposed 10 MW cap per customer per site is a sufficient constraint on individual customers accumulating credits while retaining the flexibility for applicants to deploy chargers in number and capacity consistent with their needs. Otherwise, applicants would potentially be incentivized to oversize chargers’ nameplate capacity to maximize credit eligibility.”

NRDC recommended removing geographic limits (or expanding to five miles), relaxing requirements on charging levels, allowing more than 10 FSE per site, and increasing overall program size.

- “LCFS should **allow locations anywhere in California especially for shared depots, or within 5 miles from a corridor rather than just 1 mile.** Sites should be able to have a **mix of charging levels** to meet different customer needs and be as large as 15 MW. Sites should also be allowed to be **as large as 100 connectors** to allow for future scaling as seen on the light-duty charging infrastructure side. Single fleets should also receive the same credit formula as public locations and shared depots. Finally, we also recommend the proposed **cap on prior quarter deficits be raised to 5%** based on the California Energy Commission’s analysis.”

UCS recommends increasing geographic flexibility and relaxing the 10 FSE/site limit.

- “Current draft language in Section 95486.3 limits the eligibility of MHDV FCI to areas including Federal Highway Administration Alternative Fuel Corridors and areas currently used for MHDVs parking. **We assume that staff’s inclusion of geographic and charging station power restrictions were meant in some way to focus LCFS support to charging infrastructure development in the most appropriate areas. However, the proposed restrictions are excessive and premature given the current state of the zero-emission MHDV market and infrastructure deployment.** While we appreciate that the current proposed language may be intended to prioritize some of the hardest to electrify MHDVs, the program should include flexibilities to respond to both current and future market trends and align with the ACT and ACF’s influences on the market. **The proposed geographic restrictions may reduce opportunities for developing zero-emission fueling stations geared towards regional haul and last-mile delivery vehicles in the near term.** As mentioned above, these vehicles are far more likely to return to a home base depot each night and are currently well-suited for electrification given their duty cycles and model availability. These vehicles are also on an accelerated electrification timeline in both the ACT and ACF. **The LCFS would be in better alignment with these market trends and regulations by allowing for increased geographic flexibility. Increasing geographic flexibility may help to address common barriers to charging station development including grid capacity, land availability, and zoning.** By restricting eligibility to sites currently used as vehicle parking or depots, the program fails to consider that these **sites may not have existing grid capacity to support fleet electrification.** As such, opportunities to accelerate near-term freight electrification may be stifled. A more strategic approach may be to consider phased-in restrictions that consider factors such as market trends, vehicle availability, and grid readiness and aligns with existing regulatory requirements for fleets and vehicles manufacturers.”
- “The program should also allow for additional station size and power flexibilities over the near term to influence accelerated zero-emission MHDV deployment. **The proposed restriction of 10 FSEs or 10 MW for MHD-FCI sites within one-quarter mile may reduce appetite for early investments in station development.** We understand the need for balanced credit generation to maintain sustainable credit prices, however, such restrictions should not be placed on electrified commercial transportation given its emerging natural and clear environmental upsides over combustion fuels.”

Appendix 2

Comments from Utilities

SCE recommends rejecting the 1-mile corridor requirement due to grid constraints and resulting delays and cost increases.

- “The MDHD FCI provision is critical in assisting the deployment of these charging stations by allowing developers to recover a portion of their LCFS crediting potential while their utilization grows as the electric MDHD vehicle market matures. SCE is concerned that the requirement that these sites be located within one mile of an Alternative Fuel Corridor (AFC) creates incentives for developers to impose **arbitrary constraints on the electric grid that may stall overall MDHD vehicle electrification.**”
 - “Because incentives drive market participant behavior, SCE is concerned that the strict **geographic restrictions** proposed in the draft amendments for MDHD FCI credits **will cause developers to attempt to locate sites in areas that do not have immediately available circuit capacity.** This scenario **creates undue costs** on SCE’s ratepayers and **delays the deployment** of critical MDHD charging infrastructure that is necessary to achieve the state’s decarbonization targets. For this reason, SCE recommends that CARB **reject the 1-mile requirement** and allow for greater flexibility in allowable locations for sites seeking to claim MDHD FCI credits.”

Comments from Other Industry Stakeholders and Associations

Additional support for our recommendations comes from **CalETC/EVCA** and **CALSTART** in written comments, and from **LACI** in verbal comments at the workshop.

Comments of

Michael Wara, JD, PhD,
Michael Mastrandrea, PhD,
Mareldi Ahumada-Paras, PhD,
and Ben Clark, JD, MS Candidate

Regarding

Proposed Amendments to the Low Carbon Fuel Standard

May 10, 2024

I. Introduction

We write to provide comments on the modeling assumptions underlying the California Air Resources Board's (CARB) Initial Statement of Reasons (ISOR) for the proposed Low Carbon Fuel Standard (LCFS) regulatory amendment package, along with more recent scenarios discussed at CARB's April 10, 2024 LCFS Workshop (the April Workshop). We are researchers and graduate students from Stanford University with special expertise in the development of climate and energy policy. Some of us have been active participants in CARB processes since the advent of the LCFS as an early action measure in the early days of AB32 implementation.

We write in our personal capacity. None of the views expressed below can or should be attributed in any way to the Climate and Energy Policy Program, the Woods Institute for the Environment, the Doerr School of Sustainability, or Stanford University.

First and foremost, we wish to express our appreciation to the Board for providing this opportunity for public input and to ARB staff for providing the input files necessary to meaningfully comment on the ISOR and the April Workshop. The LCFS amendment proceedings have generated substantial feedback from various stakeholders. The Board's decision to pause the proceedings—enabling additional discussion and re-evaluation—reflects its dual commitments to promoting public participation and making regulatory decisions informed by rigorous data and analysis.

To this end, we are grateful that CARB staff responded to requests related to the December 2023 ISOR, including our own, by making CATS model input and output files for each ISOR scenario publicly available, along with several new scenarios discussed at the April Workshop. In so doing, CARB encouraged transparency, public input, and engagement in the LCFS amendment process.

Additionally, we commend CARB for its continued commitment to the policy goals of the LCFS, which align with our shared objectives of shifting California's fuel mix to sustainable supplies while prioritizing decarbonization and innovation.

The purpose of this comment letter is twofold:

(1) highlight what we believe to be important updates that should be made to key assumptions in CARB's ISOR and the April Workshop scenarios to reflect the on-the-ground realities and potential trajectories of the ICE-to-ZEV transition for Medium and Heavy Duty Vehicles and real-world growth of renewable diesel supply; and

(2) share our own illustrative modeling results, based on the posted CATS input files for the ISOR and the April Workshop scenarios, that demonstrate how limiting certain renewable diesel and biodiesel production pathways does not necessitate an increase in fossil-based diesel use and credit prices, as presented in the ISOR EJAC scenario.

192.2 Based on the data CARB has made publicly available, we conclude that there is substantially more flexibility than considered in the ISOR or the April Workshop scenarios to incorporate key features of the EJAC's September 2023 resolution without the undesirable cost and emissions impacts CARB staff presented in their ISOR EJAC scenario. We hope that this letter, along with those submitted by other public stakeholders, encourages CARB to consider a revised EJAC scenario that more accurately reflects pathways to achieving EJ priorities. We emphasize that we do not present such a scenario in this comment and related modeling. Rather, we present a sensitivity analysis based on CARB's existing modeling results to demonstrate that a fundamentally different EJAC scenario can be constructed using CARB's modeling tools. In our opinion, CARB staff should work with the EJAC to consider such a scenario in this rulemaking.

192.3 We respect and value CARB's LCFS modeling efforts to date. However, we also recognize that this modeling is attempting to represent a rapidly evolving transportation fuels landscape, where even short term changes can and have quickly diverged from model assumptions and lead to skewed or misleading results. The ISOR and April Workshop scenarios are anchored to assumptions in the 2022 Scoping Plan, but two years have passed since those assumptions were made. For example, the scenarios assume that there were zero Medium and Heavy Duty Zero Emission Vehicles on the road in 2022 and 797 in 2023, while the California Energy Commission reports that there were 2,320 on the road at the end of 2022 and 3,784 at the end of 2023 (see Table 1 below).¹ We view this difference as clear evidence that the efforts of CARB to accelerate a transition to zero emission vehicles (ZEV) are already beginning to bear fruit - even more rapidly than anticipated during the scenario development for the Scoping Plan.

The assumed rates of internal combustion engine (ICE)-to-ZEV transitions are a fundamental driver of modeled demand for diesel (and gasoline). These rates are treated as fixed inputs with no uncertainty in the ISOR across scenarios that vary widely in other respects. One important implication of this approach is that the ISOR claims that its EJAC scenario would

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<https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics/medium-and-heavy>

192.3
cont. result in an increase in fossil diesel consumption. As we explain in this letter, this outcome is far from prescribed.

We evaluate and illustrate a different approach. Given the pace of the energy transition, driven in substantial part by California's innovative transportation policies, estimates of future demand and fuels supply must contend with substantial uncertainty. However, facing that uncertainty means that demand scenarios should not be treated as static. Critical but outdated assumptions should be updated when new information becomes available. That is, we believe it is essential to account for uncertainty but also to be rigorous about the aspects we do know now to ensure a model's accuracy and effectiveness. As new information becomes available, CARB needs to update its assumptions and planning to reflect new information when this information has important impacts on what California's climate policies can achieve.

II. ISOR / April Workshop assumptions and our alternative, illustrative scenario

In this section, we comment on several of the ISOR's key assumptions, particularly those that led CARB staff to conclude that their EJAC scenario, as implemented by staff in the CATS model, necessarily leads to an increase in fossil diesel consumption. We compare these assumptions to recent evidence. We then present an illustrative scenario that demonstrates the sensitivity of modeling results to those assumptions and how updating them creates flexibility that CARB may not have understood existed when they constructed the ISOR, relying on the Scoping Plan.

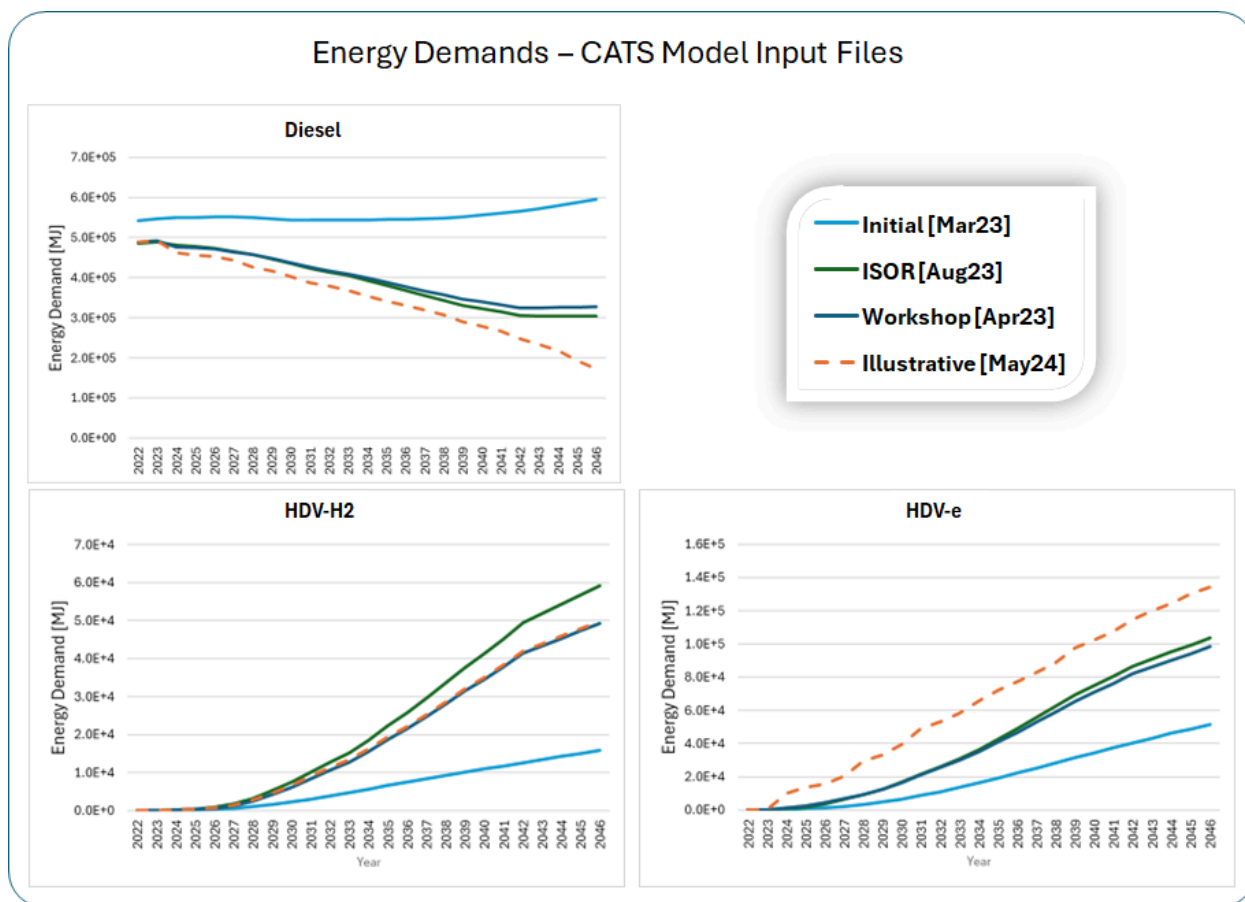
A. New data from actual ZEV deployment indicates that ISOR and April Workshop assumptions are unduly pessimistic about fleet transition

192.4 The ISOR's EJAC scenario rests on a hypothetical causal chain. Limiting LCFS credits for renewable diesel, the reasoning goes, will reduce renewable fuel production. That, in turn, will necessarily result in more fossil diesel consumption, because diesel demand will remain the same and the only available supply to meet that demand is fossil diesel. But the core assumption propelling this deterministic sequence—that fuel demand must be held fixed while other model assumptions are adjusted—fails to account for the uncertainty in future diesel demand, as well as the impact of battery electric and hydrogen vehicles on that demand. In addition, this conclusion fails to consider that assumptions about future fuels demand (including diesel) have shifted substantially across the versions of CATS modeling related to this rulemaking that CARB staff has released over the past year, as staff have incorporated estimated impacts of CARB's vehicle programs and made other adjustments (see Figure 1).

The initial example CATS modeling inputs released by CARB staff in March 2023 were updated in August 2023 to reflect modeling associated with the 2022 Scoping Plan, including the effects of ACF. After the April 2024 release of CATS model input files, it is now clear that these August 2023 inputs were those used in the ISOR. The additional scenarios released with the April Workshop contain further updates to demand, as described by CARB staff, to account

for MDV updates and PHEV gas miles. We note that all of these adjustments in assumptions are driven in part by the rapid pace of technological innovation in the sector and in part by CARB's own successful track record of rulemaking in the space.

Figure 1: Energy Demand Updates for Diesel, HDV-H2 and HDV-e. Energy demands in the CATS model have changed substantially, as CARB has incorporated the estimated effects of vehicle programs such as ACF (2022), ACCII (2019), and ACT (2019) and made other adjustments.



192.4
cont.

Table 1 compares the actual rate of adoption of Medium and Heavy Duty ZEV vehicles to the energy demands used in the ISOR and April Workshop CATS model scenarios. The assumptions that underlie the ISOR assume zero ZEV deployment in 2022 and fewer than 800 vehicles in 2023. Instead, in 2022, more than 2300 were in service and in 2023, that number had increased to over 3700 vehicles. Table 1 also compares the assumed and actual proportion of hydrogen and battery electric ZEVs. As mentioned above, we view the greater real-world deployment of ZEVs over the last two years with optimism, observing that the rate of transition from diesel-to-ZEV vehicles is actually more rapid than assumed in the Scoping Plan, ISOR, or the April Workshop scenarios.

Table 1. Actual Medium and Heavy Duty ZEV deployment versus what was assumed in the ISOR and April Workshop scenarios.

	ISOR and April Workshop CATS modeling ²		Data reported by CEC ³	
	Size of fleet	Share of ZEV	Size of fleet	Share of ZEV
2022				
- Hydrogen	0	-	134	6%
- Electricity	0	-	2186	94%
2023				
- Hydrogen	372	47%	203	5%
- Electricity	425	53%	3581	95%

Taking into account this early evidence, we construct a new illustrative scenario for fuel demand based on more rapid adoption of Medium and Heavy Duty ZEV vehicles that replace diesel vehicles. This illustrative scenario, with reduced diesel demand and increased ZEV demand, enables a sensitivity analysis of this key assumption - the rate of medium and heavy duty ZEV adoption. We use actual 2022 and 2023 ZEV deployment as our starting point, and limit the year-over-year percentage increase in Medium and Heavy Duty ZEV vehicles to the observed increase between 2022 and 2023 (~60%). Further, we assume that battery electric ZEVs meet this increased demand, given their overwhelming share of the currently deployed ZEV stock. We note that the ISOR and April Workshop scenarios assume a higher percentage of hydrogen ZEVs than actual deployment to date.

192.4
cont.

The delay in uptake of hydrogen fueled HDVs may change as hydrogen fueling stations become more available and vehicle choice increases, with the cumulative effect being even faster deployment than observed from 2021 to 2023 since battery electric deployment is already on a much faster growth curve than projected just a few years ago and hydrogen vehicles will reinforce that success. Throughout all of this, it is crucial to remember that adoption of ZEVs is an assumption and input to the CATS model, not something that the model simulates. This means that the assumption, to the degree that it differs from reality on the ground, should be updated as soon as better information becomes available. This is particularly true when model results depend heavily on the assumption in question.

Figure 2 compares Medium and Heavy Duty vehicles on the road and energy demand by fuel type for the most recent April Workshop scenarios released by CARB staff and our illustrative scenario. Our illustrative scenario assumes that the overall number of vehicles on the

² <https://ww2.arb.ca.gov/resources/documents/supplemental-2023-lcfs-isor-documentation>

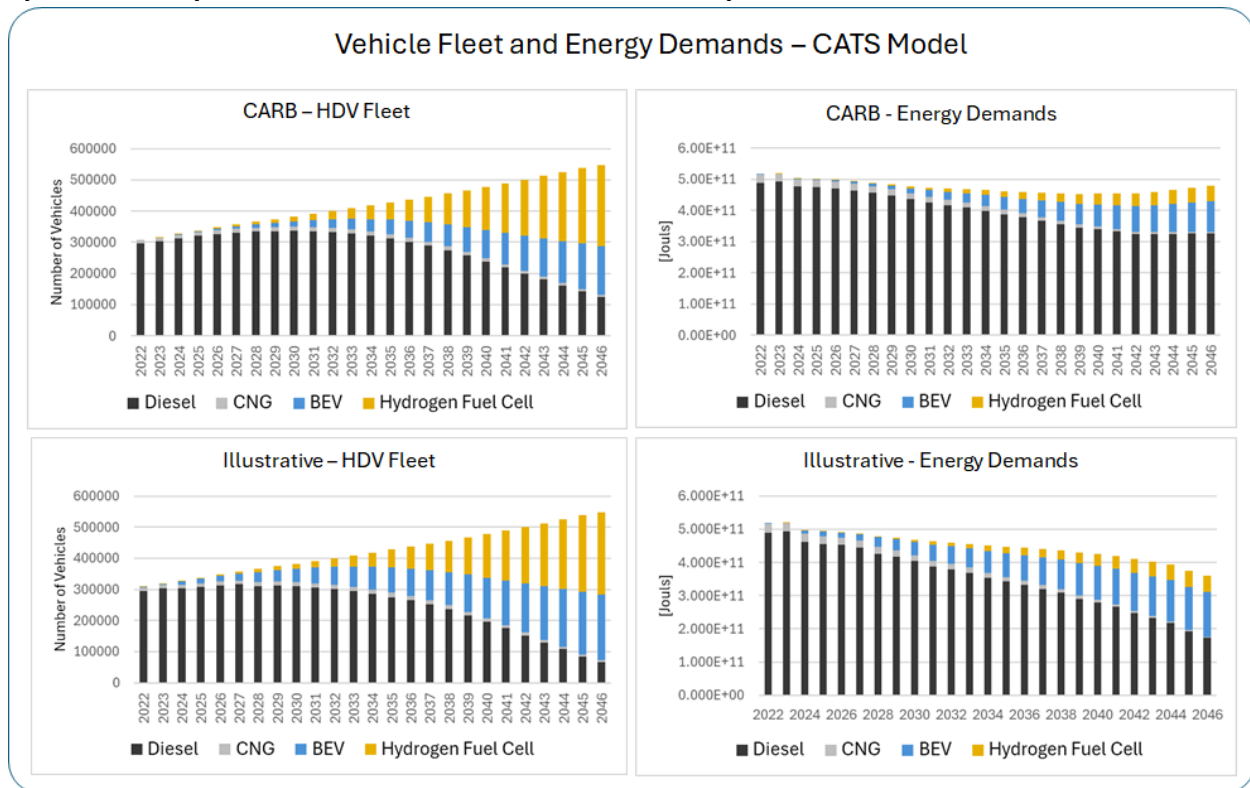
³

<https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics/medium-and-heavy>

192.4
cont.

road in any year matches the number assumed in the April Workshop scenarios, but that the type of vehicle can vary (with more ZEV than diesel vehicles). Because battery electric vehicles are more energy efficient than diesel vehicles, this shift reduces overall energy demand for the same number of vehicles on the road. Overall, this results in a modest acceleration - to 2038 from 2040 - of reaching 50/50% fossil diesel and compressed natural gas (CNG) vehicles vs. ZEV

Figure 2: Vehicle fleet and energy demands for Medium and Heavy Duty vehicles in the CARB April Workshop scenarios and our illustrative scenario presented in this comment.



B. Underestimation of renewable diesel refining capacity threatens to further saturate the LCFS market with RD credits and reduce credit values.

As we discussed in our February 20, 2024 comment letter, growth in renewable diesel (RD) supply “has continued to far outstrip expectations.”⁴ CARB staff’s projections, as of August 2023, estimated that 1.15 billion gallons of RD would be produced in 2023 by facilities participating in the LCFS. But CARB’s LCFS Quarterly Data Spreadsheet, updated through Q4 2023 and released on April 30, 2024, reveals that RD production in 2023 totaled 1.97 billion gallons, with consistent quarter-on-quarter growth despite low LCFS prices throughout the year.⁵ Further, two new projects expected to come fully online in 2024 (the Phillips 66 refinery in

⁴ <https://www.arb.ca.gov/lists/com-attach/7057-lcfs2024-AXJRI1c3UWwDY1I9.pdf>

⁵

<https://www2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/dashboard/quarterlysummary/Q4%202023%20Data%20Summary.pdf>

Rodeo and the Marathon refinery in Martinez) are expected to significantly expand RD production further, on their own adding as much as 1.4 billion gallons. Production growth of such magnitude raises numerous environmental and agricultural concerns, from feedstock shortages and increased reliance on crop-based feedstocks to deforestation and indirect land use change emissions. While those consequences are not the focus of this comment letter, we encourage the Board to keep them in mind and for staff to further evaluate them.

In our illustrative scenario, we impose a simple volumetric cap on biodiesel and renewable diesel at the level of reported 2023 volumes. We do not suggest that this is the cap that should be adopted, as it is purely an illustrative choice. We view such a cap as implementable and practical within the LCFS framework, particularly if eligibility to sell LCFS creditable gallons was itself a marketable commodity that could be traded between producers.

We encourage CARB to conduct a full analysis of the implications of different cap levels, to evaluate the ongoing changes in the RD market both inside and outside the LCFS, and to seek additional input from the EJAC and other stakeholders on this issue prior to finalizing an LCFS amendments package. Growth in the supply of RD for reasons that do not appear connected to the LCFS or the incentives that it creates appears poised to upend all expectations and assumptions regarding the incentives for innovation created by the LCFS. Significantly more thinking and engagement is required before the Board should act to lock in a planning framework given that RD supply as soon as the end of this year could easily total 3.4 billion gallons.

C. The dairy methane “cliff” in the ISOR and April Workshop modeling

We raise one additional issue with CARB staff’s ISOR EJAC scenario: the dairy methane “cliff.” The ISOR EJAC scenario assumes that all pathways for dairy methane crediting are canceled after 2024: that is, the scenario completely eliminates dairy gas pathways beginning on January 1, 2025. This causes the CATS model to add more carbon intensive fuels to the mix to fill this abrupt drop in supply. Further, in the April Workshop, CARB mentioned that the EJAC pathway would have the added negative effect of stranding agricultural assets and forcing CARB to go back on its word regarding pathways it had already approved.

Table 3. Currently approved dairy methane and selected fuel pathway carbon intensities

Fuel Pathway	Carbon Intensity (gCO ₂ e/MJ)
CNG from Dairies	-293
LDV / HDV Hydrogen (Dairy Gas)	-353
LDV-e/HDV-e (Dairy Gas)	-440
LDV-e/HDV-e (0-CI)	0

192.6
cont.

It is our understanding that the EJAC proposed the immediate elimination of *future* pathway approvals for dairy methane at current carbon intensity (CI) scores.⁶ Such an approach would allow already-approved pathways to maintain their LCFS approval for the entirety of their 10-year duration. With this timeline, most current contracts would sunset by 2032. This approach contemplates not a “cliff” but a more gradual transition of dairy methane crediting to higher CI values, honoring CARB commitments to existing LCFS pathways while also increasing the carbon intensity (CI) of dairy methane by 2032. CARB has set the average CI for avoided dairy methane per pathway as reported in Table 3, based on the assumption that dairy methane would otherwise be released to the atmosphere. To illustrate a more gradual transition to a higher dairy methane CI, we assume that the Board decides to stop approval of future pathways with the CI scores in Table 3, and instead adopts a higher CI for dairy methane projects more in line with methane produced from sewage treatment plants (which are assumed flare methane to carbon dioxide rather than simply venting methane to the atmosphere). This gradually increases the average CI score of dairy methane so that it reaches a positive value of ~44 gCO₂e/MJ by 2032.

III. Illustrative scenario results and comparison to ISOR and April Workshop scenarios

192.7

We present the results of our illustrative scenario in comparison to the ISOR EJAC and proposed scenarios, and the April Workshop scenario with a 5% stepdown in Figure 3 and Table 4.⁷ As stated above, our illustrative scenario is not intended as a new proposal, but instead to enable a sensitivity analysis based on CARB’s existing modeling results. It shows that a scenario consistent with many of the asks from the environmental justice community, can be constructed using CARB’s modeling tools and consistent with many of CARB’s stated objectives both from the Scoping Plan Update and as stated in the current LCFS amendment process.

As stated above, the illustrative scenario contains both a volumetric limit on RD at 2023 levels and a transition of pathways for dairy methane crediting that assume a baseline of flaring rather than venting, similar to sewage treatment methane. It is based on the April Workshop input files and so also contains the 5% stepdown in CI. The illustrative scenario allows for reasonably similar credit prices to those proposed by CARB staff, it achieves similar emission reduction objectives in the liquid fuels sector, and it does not rely on burning more fossil fuels in order to limit RD or livestock dairy book-and-claim crediting. The illustrative scenario achieves this by relying on modest changes to assumptions about the mix of ZEV and emitting vehicles on the road that we believe more realistically depict what has and is actually happening in California since the Scoping Plan modeling was conducted (see above).

We emphasize that this scenario is illustrative and does not attempt to fully represent any proposal from the EJAC or other stakeholders. Other choices about RD limits, dairy methane pathways, or other changes to the LCFS are also possible. We believe that what is most important here is to illustrate the fundamental sensitivity of conclusions in the rulemaking to

⁶ <https://ww2.arb.ca.gov/sites/default/files/barcu/board/books/2023/091423/ejacpres.pdf>

⁷ <https://ww2.arb.ca.gov/resources/documents/supplemental-2023-lcfs-isor-documentation>

assumptions that we believe are out of date and unduly pessimistic. Updating assumptions to take better account of actual data that shows California’s early success in deployment of ZEVS unlocks options that would not have been apparent in modeling that relied on older assumptions related to the Scoping Plan Update. We are happy to share additional details regarding our scenario with staff or other stakeholders upon request.

Figure 3: Comparison of credit prices across scenarios



Table 4: Comparison of cumulative fossil diesel (ULSD), renewable diesel (RD), and biodiesel across scenarios. The Illustrative scenario uses less ULSD, RD and BD than the CARB scenarios.

Fuel type	ISOR Proposed	ISOR EJAC	April Workshop (5% stepdown)	Illustrative_May24
ULSD [mm gal]	50708	50708	27104	21567
Renewable Diesel [mm gal]	16026	16026	42187	38245
Biodiesel [mm gal]	7088	7088	7029	6930

V. Conclusion

CARB's history demonstrates the agency's successful track record of incentivizing transformative innovation that drives positive environmental outcomes through regulation. Indeed, technology-forcing rules are necessary to achieve the LCFS's climate goals, especially to facilitate the transition to an electric- and hydrogen-fueled future. CARB staff's most recent modeling, because it fails to incorporate new information about progress that CARB has itself achieved in pushing ZEVs into the medium and heavy duty fleets and neglects the extraordinary pace of growth in RD supply, paints a picture for the Board that appears to limit its freedom to modify the LCFS to limit RD supply, constrain book and claim methane crediting, or make other changes.

192.8

We remain optimistic about the potential of the LCFS to drive progress toward a just and equitable zero-emissions future. We are hopeful that the analysis we present above, both of assumptions and in our illustrative scenario, may prove useful to CARB staff, the Board, and other stakeholders in considering a broader set of options for updating the LCFS to reflect both the incredible achievements in ZEV deployments as well as the EJAC's priorities.



May 10, 2024

The Honorable Liane M. Randolph, Chair
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Response to CARB April 10 workshop request for feedback on Step Down and Auto Acceleration Mechanism

Dear Chair Randolph,

We again thank CARB for its diligent work throughout this rulemaking process, including rigorous modeling and analysis of empirical information; considering and balancing diverse stakeholder feedback; and hosting multiple workshops, including the workshop of April 10, 2024, which invited these comments.

193.1

The Low Carbon Fuel Standard (LCFS) has by all measures been a historically successful GHG emissions reductions program. However, the accelerated pace of carbon intensity (CI) reductions signifying this success have resulted in a corresponding substantial oversupply of credits, creating a precipitous drop in the LCFS credit price, which is already stalling clean fuels and technologies investments.

The Low Carbon Fuels Coalition and the diverse companies and stakeholders listed below are submitting these comments in response to CARB's request for feedback on the Step Down and Auto-Acceleration Mechanism (AAM). These comments build on two analytical reports by ICF commissioned and previously submitted for the record to inform this rulemaking^{1,2}, and reflect subsequent analysis by ICF based on the most recent program data and the additional technical information provided by CARB in conjunction with the April 10 workshop.

Summary Recommendations

LCFS credit prices have continued to decrease precipitously over the course of the LCFS rulemaking, declining even further this week from the new low of \$56 reported on April 30, while accumulated credits are at an all-time high. In order to rebalance the market, we are writing to strongly encourage CARB to implement the following within the LCFS final rule:

¹ See Comment of the Low Carbon Fuels Coalition and Supporting Companies and Organizations, September 28, 2023, at <https://www.arb.ca.gov/lists/com-attach/27-lcfsupdate2023-VWcGMwQ1VD5RZVJq.pdf>

² See Comment of the Low Carbon Fuels Coalition and Supporting Companies and Organizations, February 20, 2024, at <https://www.arb.ca.gov/lists/com-attach/7062-lcfs2024-BXAFcwFkWWsCcFA1.pdf>

193.1
cont.

1.) An initial step down of 9%

193.2

2.) An AAM implementation that can be triggered as early as 2026, with modifications to enact the AAM when the credit bank is more than 2.5 times greater than the quarterly deficits generated.

Initial Step Down for 2025

193.1
cont.

The Initial Statement of Reasons (ISOR) analysis by ICF indicated that achieving a target credit bank equivalent of 2-3 quarters worth of deficits requires a step down of 10.5% to 11.5% in 2025, more than double the 5% initially proposed in this rulemaking.

Of the step-down alternatives presented at the April 10 workshop, a 9% initial step-down is closest to the ICF assessment, and therefore provides the most certainty to rebalance the LCFS credit bank as intended within this rulemaking. Implementing a 5% or 7% would virtually require the AAM to trigger in order to draw down the credit bank, delaying the necessary market correction at a time when credit prices are at an all-time low. **To avoid such a delay and restore investor and market confidence, we strongly encourage CARB to implement the 9% step-down in the final rule.**

Automatic Acceleration Mechanism

Despite being lower than ICF analysis indicates is necessary, the 9% step down may avoid the AAM trigger, should the step down itself rebalance the LCFS credit market. However, the AAM provides an important insurance mechanism, should the step down be insufficient.

193.2
cont.

If the AAM conditions are met in spite of the step down, **the corrective mechanism should be triggered sooner than later, as early as 2026** rather than delaying a potential correction to come into effect in 2027 or 2028. As stated in the ISOR Case Report by ICF:

ICF recommends that the Automatic Acceleration Mechanism be considered for implementation as soon as 2026, rather than waiting until 2028. ICF also recommends that the first criteria for the Automatic Acceleration Mechanism be modified such that the mechanism is enacted when the credit bank is more than 2.5 times greater than the quarterly deficits generated in a given year (down from the proposed value of 3 times).

We support CARB's proposal to establish an AAM that will only trigger a CI reduction when the market metrics pertaining the credit bank size and credit/deficit generation ratio are fulfilled. In the event that credit generation decreases unexpectedly, we note that the AAM will not be triggered.

193.3

We also collectively urge CARB to avoid selectively limiting or disadvantaging technologies or pathways that can reduce GHG reductions within the LCFS program. The principle of technology neutrality has allowed the LCFS program to achieve GHG reductions more quickly and cost-effectively than anticipated, as reflected in the greater ambition proposed in this rulemaking. CARB's analysis presented at the workshop also reflects the risks of selective

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cont. limitations, with a more selective approach resulting in fewer GHG reductions, more petroleum use, higher health costs due to pollution, and higher LCFS program costs overall.³

By maintaining its commitment to crediting GHG reductions from all sources related to transportation, additional LCFS ambition will ensure Californians will enjoy the benefits of clean transportation and California continues to lead the world in addressing the climate crisis and improving air quality, at the lowest cost.



³ CARB Staff Presentation from April 10, 2024 workshop



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May 10, 2024

Clerks' Office
California Air Resources Board
1001 I Street
Sacramento, California 95814

Re: Opposition to California Air Resources Board Proposal to Regulate Jet Fuel

Dear Chair Randolph,

On behalf of the San Francisco Chamber of Commerce, I am writing to share our opposition to the recent California Air Resources Board (CARB) proposal to regulate jet fuel under its Low Carb Fuel Standard (LCFS) Program. We believe the CARB proposal will raise the cost of jet fuel without inducing additional Sustainable Aviation Fuels (SAF) production or use in California, an objective the aviation industry shares with CARB. And further, the proposal to regulate jet fuel is preempted by federal authority. We encourage CARB to withdraw the proposal to regulate jet fuel and instead establish a joint CARB-industry working group to explore alternative solutions to increase SAF production and use.

The San Francisco Chamber of Commerce works closely with a plethora of companies working actively to reduce their climate impact and achieve net zero carbon emissions by 2050, and transitioning to SAF is core to this commitment. We have long recognized that scaling up the supply of SAF and achieving net-zero carbon emissions by 2050 can only happen by working collaboratively with governments and other stakeholders across sectors. Achieving this ambition for SAF will require new and additional policy incentives, streamlined permitting processes, and close collaboration among governments, the aviation industry, the fuels industry, environmental organizations and others.

Aviation accounts for 2.6% of the U.S. greenhouse gas emissions but 5% of U.S. Gross Domestic Product (GDP) and 4.1% of California's GDP, thus exerting outsize economic impact relative to its share of emissions. U.S. civil aviation firms employ more than 380,000 California-based employees, with an overall economic impact of \$194 billion.[1] Aviation is critical to driving California's economy and its rank as the 5th largest economy in the world, enabling \$114 billion in annual trade flows and underpinning many of California's other significant economic drivers such as agriculture, tourism, manufacturing, banking, technology and small business.

California has established itself as an early leader in attracting investment, production, and use of SAF through the existing LCFS Program, which provides an opt-in credit for SAF that helps reduce the price difference between SAF and conventional jet fuel. Ensuring a healthy and vibrant aviation industry is essential to California's future, and leveraging CARB's early leadership on SAF can enable California leadership in the emerging SAF production industry, creating new jobs and economic development opportunities.

With this context, we express our serious concern with the proposal by CARB to regulate jet fuel used for flights within California as an obligated fuel under the LCFS Program. The proposal to eliminate the exemption for jet fuel used on intrastate flights would not result in significantly increased SAF production, availability, or use in California, but would lead to higher jet fuel prices and slow down, rather than accelerate, efforts to increase the

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cont.

state's SAF production and use. The primary impediment to increased SAF production and availability in California remains the higher cost of SAF for producers and buyers relative to conventional jet fuel and renewable diesel. Whether or not jet fuel becomes a deficit generating fuel has no direct impact on whether SAF is produced or used. As the proposal does not provide a mechanism to reduce the economic disadvantage of alternative jet fuel, it will have no material impact on the availability or use of alternative jet fuel in California.

In addition to not being an effective policy tool to increase SAF production, the proposal seeks to regulate jet fuel and reduce emissions from aviation, both of which are preempted under federal law, a fact that CARB recognized when it exempted jet fuel from the LCFS in 2018.^[2] Aviation, unlike many other industries, is uniquely situated in that other factors such as the safe operation and maintenance of aircraft are of great importance, which the federal government has recognized in the jurisdiction of the FAA and the EPA's Clean Air Act.

Our mutual interest is to increase SAF production, availability, and use, and the most effective way to accomplish this is to continue the positive, collaborative approach represented by the existing "opt-in" mechanism developed by CARB and the aviation community. Only actual SAF use – not merely the creation of jet fuel deficits – will provide the benefits of SAF desired by CARB, airport communities, SAF producers, and airlines. We urge CARB to reconsider and withdraw the proposal to remove the exemption for jet fuel for intrastate flights, preserve the existing opt-in approach for SAF, and establish a joint CARB-industry working group with stakeholders across the emerging SAF ecosystem to explore alternative policy and voluntary proposals to rapidly increase SAF production, availability and use in California. We look forward to working with CARB on such measures to accelerate SAF deployment.

Respectfully,



Rodney Fong
President & CEO
The San Francisco Chamber of Commerce

[1] [The Economic Impact of Civil Aviation on the U.S. Economy, State Supplement, US Department of Transportation, November 2020](#)

[2] CARB stated that "[s]ubjecting aircraft fuels to annual carbon intensity standards would raise federal preemption issues" *available at* https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2018/lcfs18/isor.pdf?_ga=2.259407882.1202437490.1641231788-253234234.1573227006

May 9, 2024

California Air Resources Board
Low Carbon Fuel Standard Program

RE: LCFS eForklifts EER 50% drop proposed amendment


SCT, and on behalf of its client companies, respectfully submits the following comments to California Air Resources Board (CARB) Staff with the hope of advancing the LCFS program in a way that makes it easy and practical for concerned stakeholders to participate. Consistent with our role, **Smart Charging Technologies submits this letter to express our concern and offer solutions to the proposed amendment dropping eForklift EER from 3.8 to 1.9.**

First, the concerns:

1. Recent implementation of eForklifts metering requirements in Oregon resulted in over 90% drop in credits 4Q22 to 4Q23.

Looking at the **DEQ 4Q23** Credits report we notice:

- The 1st impact of metering started showing on 1Q23 when DEQ allowed only 30% Depth of Discharge. This resulted in a drop of 78% between 4Q22 and 1Q23.
- The 2nd impact of metering, a drop of 75%, showed on 4Q23 when using credit estimation was discontinued.
- Thus, the total impact of metering is a drop of over 90% between 4Q22 and 4Q23

 Credits State of Oregon Department of Environmental Quality	2020				2021				2022				2023			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Alternative Jet Fuel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B20 Diesel	-	5	-	-	-	-	-	-	-	1	11	-	-	-	-	-
B5 Diesel	740	607	1,639	1,630	1,642	1,468	2,302	1,967	3,620	3,427	5,948	6,200	7,802	12,810	-	-
Bio-CNG	3,097	3,312	3,471	4,521	9,662	11,595	11,716	9,342	4,093	9,021	21,991	36,271	41,778	41,393	-	-
Biodiesel	126,284	126,047	102,155	141,521	145,411	132,217	117,168	171,953	118,041	158,293	106,866	117,603	128,222	125,897	-	-
Bio-LNG	360	312	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diesel	1,553	2,354	262	313	109	25	67	94	99	2	657	1	256	380	-	-
E10 Gasoline	1,891	1,509	4,714	5,704	6,051	5,410	10,570	11,134	12,915	11,721	15,607	15,884	11,218	11,849	-	-
Electricity - Offroad: eForklifts	4,221	4,760	15,328	20,430	23,188	24,736	27,027	28,745	32,077	31,817	7,009	11,099	11,071	2,724	-75%	-78%

2. Using the LCFS Credit/Deficit formula shows that reducing the eForklift EER by 50% reduces credits by 66%.

$$\text{Credits} = \left(CI_{\text{standard}}^{\text{diesel}} - \frac{CI_{\text{electricity}}}{EER} \right) \times E_{\text{diesel displaced}} \times 10^{-6}$$

$$E_{\text{diesel displaced}} = \text{Energy} \times EER \text{ for forklifts newer than 2010 model year}$$

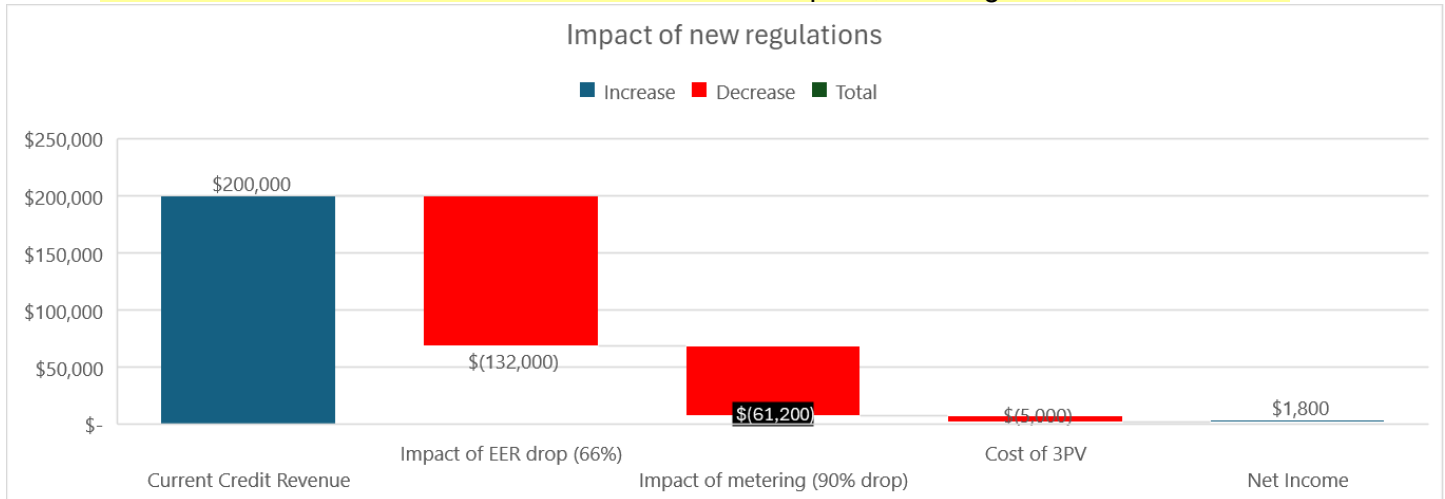
- The 50% drop in EER is impacting the number of Credits twice
 - EER is used in the CI difference as a denominator
 - EER is used as a multiplier reducing the CI difference by 50%
 - The net impact is a 66% drop in the number of credits

Select Year	Select the Heavy-Duty/Off-Road Applications (Fuels used as Diesel replacement)	Electricity used (kWh)	Electricity Source	2023 Diesel CI (gCO2e/MJ)	2023 California Grid Electricity CI (gCO2e/MJ)	Avg Energy Density for Electricity (MJ/KWh)	Electricity Forklifts (post-2010) Energy Economy Ratio (EER)	C (MT/gCO2e)	Credits / Deficits (MT)	Delta
2023	Electricity Forklifts (post-2010)	1,000	Cal Grid	89.15	81.49	3.6	3.8	0.0000019	9262080	-66%
2023	Electricity Forklifts (post-2010)	1,000	Cal Grid	89.15	81.49	3.6	1.9	0.0000019	0.316422	-66%

3. Combining the impact of Metering and EER drop causes severe eForklift Feasibility Impact.

- Reducing the eForklift EER by 50% reduces credits by (66%)
- New Metering requirements reduce credits by (90%)
- 3rd-Party Verification(Electricity) increases costs by \$5k - \$10k.
- The above proposed requirements lead to a very narrow margin, if not negative. This is a major disincentive to customers to go with eForklift.

The above impacts are illustrated in the following waterfall chart for a company having 2000 credits, sold at a \$100 each, almost double the current market price, resulting in \$1,800 net income:



4. Such impact leads to:

- Enrolled fleet operators opting out.
- Missing an opportunity to reduce CI from fossil forklift continued presence (40% of the market).

5. EER represents a scientific tool to compare the fuel efficiency of eForklift vs. fossil fuel forklift. Not a tool to arbitrary reflect policies or commercial reality.

“Energy Economy Ratio (EER)” means the dimensionless value that represents the efficiency of a fuel as used in a powertrain as compared to a reference fuel used in the same powertrain. EERs are often a comparison of miles per gasoline gallon equivalent (mpge) between two fuels.”

Second, the potential solutions:

1. A more gradual approach is warranted to avoid negative reactions.

According to CARB’s rational document, “*This proposed amendment (EER 50% drop) is necessary to ensure that forklift crediting more accurately reflect the fuels displaced by electricity and hydrogen forklift fueling.*”

- The above goal can be easily attained by the metering requirement as shown from the numbers in **Oregon** (90% drop in eFL credits 4Q22 to 4Q23).
- Re-asses the above CARB rational after studying the effect of implementing metering on the number of credits.

2. Class III Forklifts

According to CARB’s rational document, class III represents ~20% of the forklifts and not really contributing to the fossil fuel displacement.

- Removing Class III forklifts from the baseline may contribute to solve the baseline problem.
- Trying to delineate energy consumption amongst above and below 12,000lb lift capacities will be difficult for most fleets.

- The cost of metering implementation was not feasible for Class III fleet operators in Oregon, hence they opted out.

3. Fixing the inaccurate baseline problem

If an inaccurate baseline continues to be a problem, then a more scientific approach, e.g. Fractional Displacement¹, may be considered for future rulemaking². In the paper, Dr. Murphy makes the following recommendation regarding e-forklifts:

“Based on the assumption of a 40% incumbent fraction, immediate application of FD crediting would result in a precipitous drop in LCFS credit generation from this category, compared to the current method. While this would more accurately reflect anticipated emissions benefits, it could have a disruptive effect on the progress of this sector toward carbon neutrality. To mitigate this, a gradual catch-up approach that limited the maximum rate of change for the FD term to no more than 10% per year was adopted. This guaranteed a phase-down period for credits from fuel displacement of no less than 10 years (Figure 4).”

4. A methodology for phasing out mature technologies is vital to keep LCFS a technology-neutral program.

- ARB should establish clear criteria for what warrants a specific technology or fuel being phased out of the program.
- It is unclear whether an EER adjustment is only a mechanism for electricity-based crediting, as such a change has not been suggested for renewable diesel which is currently 40% of the diesel pool in California. ARB should clarify if it intends to apply a similar restructuring of credits from renewable diesel if renewable diesel grows to represent 50% or more of the diesel pool in California. Any proposal to phase out specific fuels or technologies should be applied equally to all fuels in the program, not just to electric vehicles.
- We also request that CARB establish clear rules on “how” technologies will be phased out. The LCFS should provide an off-ramp or other provision geared at a smooth and predictable transition out of the program. These provisions ensure market certainty for ZEV manufacturers and market participants.
- CARB will also need to assess any broader impacts to the program if specific credit-generating technologies or fuels are phased out of the program but the deficit-generating fuels that these technologies replace continue to be regulated in the program.

In conclusion, we again caution dropping the EER by 50% has far-reaching implications, and its implementation, if at all, should only take place after careful collaboration and dialogue with the aggregators. We appreciate your time and consideration, and look forward to finding a solution that will be acceptable to all stakeholders while continuing to advance the goals of CARB.

Sincerely,

Ma'n Altaher

Ma'n Altaher
Director, Regulatory & Program Management
Smart Charging Technologies LLC

¹ Dr. Colin Murphy, “Improving Credit Quantification Under the LCFS: The Case for a Fractional Displacement Approach,” (December 21, 2022), at <https://escholarship.org/uc/item/0px4m8hz>, at p. 16.

² See comments by CleanFuture March 15, 2023

From: [Manny Rutinel](#)
To: [ARB LCFS Workshop](#); [Randolph, Liane@ARB](#); [ARB Board Member Liaison](#); [equerra@cityofsacramento.org](#); [john.balmes@ucsf.edu](#); [Diane@environmentalhealth.org](#); [dean@balancebpr.com](#); [hcdelatorre@att.net](#); [davinahurtforcarb@gmail.com](#); [Rechtschaffen, Cliff@ARB](#); [sshaheen@berkeley.edu](#); [District1community@sdcounty.ca.gov](#); [tpacheco@csufresno.edu](#); [gkracov@aqmd.gov](#); [Miranda, Hazel@ARB](#); [assemblymember.eduardo.garcia@assembly.ca.gov](#); [Carlos.Gonzalez@asm.ca.gov](#); [henry.stern@sen.ca.gov](#); [ross.zelen@sen.ca.gov](#); [Lauren.Sanchez@gov.ca.gov](#); [governor@governor.ca.gov](#); [gavin.newsom@gov.ca.gov](#); [Agency Secretary, Garcia](#)
Subject: Urgent Need for Review and Action on Factory Farm Biogas Inclusion in LCFS Amendments
Date: Thursday, May 2, 2024 2:23:49 PM

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Dear Members of the California Air Resources Board,

I am writing as an environmental attorney deeply concerned about the recent proceedings related to the proposed amendments to the Low Carbon Fuel Standard (LCFS). It has come to my attention that during the public workshop held on April 10th, crucial discussions about the incentivization of factory farm biogas were conspicuously absent from the agenda.

This omission is particularly alarming given the direct instructions from CARB's leadership to address this issue thoroughly and to seek equitable solutions. The LCFS, while a California policy, is influencing the expansion of factory farms and biogas projects across the United States, affecting states such as Arizona, Idaho, and New York, among others. This has placed undue burdens on rural communities and has raised significant environmental and public health concerns that deserve immediate attention and action.

It is disheartening to observe that instead of fostering an open dialogue about these critical impacts, there appears to be a deliberate attempt by CARB staff to shield the program from scrutiny and protect investor profits at the expense of the communities affected by these policies. Such actions undermine the integrity of CARB as a regulatory body and erode public trust in its commitment to environmental justice and public health.

As an advocate for the environment and the rights of communities impacted by these policies, I urge Governor Newsom and the CARB board members to take immediate corrective measures. It is essential to ensure that the LCFS does not continue to promote harmful factory farm biogas production under the guise of sustainable development.

I demand a reevaluation of the LCFS amendments to prioritize the health and well-being of all affected communities, particularly those in California's Central Valley, who bear the brunt of these environmental injustices. We must align the LCFS with practices that support true sustainable energy solutions and uphold CARB's mission to protect the environment and public health.

Thank you for considering this critical matter. I look forward to your prompt response and to seeing significant adjustments in the policy to reflect these concerns.

Sincerely,
Manny



Manny Rutinel

[Food for the Future](#) | Founder

Yale Law School, JD



7204412672

manny@foodforthefuture.earth

From: [Patty Hine](#)
To: [ARB LCFS Workshop](#)
Subject: Comments on Factory Farm Gas Policy
Date: Monday, May 6, 2024 12:11:37 PM

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

To Whom It May Concern:

The Low Carbon Fuel Standards amendments should cover pollution from factory farms. Obviously. But you recently chose to turn a blind eye to the adverse effects of this health-harming and planet-warming biogas.

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In spite of years of strong advocacy by the people who feel the deleterious effects the most, you are protecting business profits.

Without change, your policy is driving expansion and entrenchment of factory farms in my state of Oregon. Communities don't want them.

Don't export your dirty energy policy to rural communities without regard for local impact.

Thank you.
Patricia Hine
350 Eugene, President

--

To not become discouraged is an act of courage.