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 4 - Table 4 Second 15-Day Comments

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



California Fuels and Convenience Alliance

2520 Venture Oaks Way, Suite 100

Sacramento, CA 95833

916.646.5999

October 2, 2024

California Air Resources Board 1001 I Street Sacramento, California 95814

RE: Second Modified Text and Availability of Additional Documents and/or Information for the Proposed Low Carbon Fuel Standard Amendments

The California Fuels and Convenience Alliance (CFCA) represents about 300 members, including nearly 90% of all the independent petroleum marketers in the state and more than one half of the state's 12,000 convenience retailers. Our members are small, family- and minority-owned businesses that provide services to nearly every family in California. Additionally, CFCA members fuel local governments, law enforcement, city and county fire departments, ambulances/emergency vehicles, school district bus fleets, construction firms, marinas, public and private transit companies, hospital emergency generators, trucking fleets, independent fuel retailers (small chains and mom-and-pop gas stations) and California agriculture, among many others.

We must remain respectfully opposed the second proposed amendments to the Low Carbon Fuel
 Standard (LCFS) program. Our analysis of the proposed changes reveals significant concerns about their potential impacts on fuel supply, consumer prices, and the overall effectiveness of the state's energy transition strategy. We specifically oppose the following amendments:

1. Caps on Credits for Biomass-Based Diesel from Virgin Soybean, Sunflower and Canola Oils: The proposed amendment introducing a company-wide 20% cap on credits for biomass-based diesel produced from virgin soybean, sunflower and canola oils raises several significant concerns:

001.2 A. Market Distortion

I. Artificial Barriers to Market Access: Imposing a cap of 20% on credits for biomass-based diesel from specific feedstocks, such as virgin soybean, sunflower and canola oils, creates an artificial barrier that restricts market dynamics. This cap favors particular feedstocks over others, which could skew market incentives and lead to an imbalanced biofuel market. By limiting credit eligibility for certain feedstocks, the policy risks creating a market where only a few feedstocks are economically viable, reducing competition and innovation. 001.2 cont. II. Stifling Innovation: The proposed cap on credits for biomass-based diesel produced from virgin soybean, sunflower and canola oils could unintentionally stifle innovation by creating an uneven playing field within the biofuel market. While the cap does not restrict biofuels produced from other feedstocks, it may still shift focus and resources toward optimizing the production of non-capped feedstocks, potentially diverting attention away from the exploration and development of new and innovative biofuel technologies. This could result in a market that prioritizes the use of available feedstocks rather than fostering a diverse and forward-thinking approach to biofuel development. An approach that avoids such specific caps and incentivizes a wider range of biofuels would better support a competitive and innovative market, driving advancements across various technologies and more effectively contributing to California's clean energy goals.

B. Compliance Burden

- I. Uneven Implementation Timeline: The proposed amendment introduces additional compliance complexities by setting different timelines for companies. Those with existing certified pathways prior to the adoption of the amendment have until January 1, 2028, to adjust their feedstock contracts, while other companies must comply immediately. This uneven timeline creates a competitive disadvantage for companies that must adapt quickly without the benefit of a transition period.
- II. Administrative and Financial Strain: Companies will face increased administrative and financial burdens as they navigate the new compliance requirements. The need to renegotiate feedstock contracts, adapt production processes, and manage the associated costs can strain resources, particularly for smaller or less resourced companies. This added complexity could lead to operational inefficiencies and increased costs, further impacting the overall market.
- III. Market Uncertainty: The discrepancy in compliance timelines may lead to uncertainty in the market. Companies may be hesitant to invest in longterm projects or make strategic decisions due to the potential for regulatory changes and the associated risks. This uncertainty can undermine confidence in the biofuel market and impede progress toward clean energy objectives.

C. Price Increases

I. **Disruption of Long-Term Contracts:** The shift in feedstock requirements imposed by the cap could disrupt existing long-term contracts for feedstocks. Companies that have invested in and committed to contracts based on the previous regulations may face financial losses or supply chain disruptions as they adjust to the new requirements. This disruption can lead to increased production costs for biodiesel and renewable diesel.

- II. Higher Fuel Prices: As a result of increased production costs and potential supply shortages, fuel prices are likely to rise. Higher costs for biodiesel and renewable diesel would be passed on to consumers, directly impacting the affordability of lower-carbon alternatives. This price increase could diminish the economic benefits of transitioning to lowercarbon fuels and potentially reduce consumer adoption of these cleaner options.
- III. Impact on Consumer Affordability: The increased fuel prices resulting from the proposed changes will disproportionately affect consumers, particularly those in lower-income communities. The rise in fuel costs can strain household budgets and exacerbate existing financial challenges, making it harder for these communities to benefit from cleaner, lowercarbon energy options.

D. Program Integrity

- I. Slowing the Transition from Petroleum Diesel: The proposed cap on credits could undermine the effectiveness of the LCFS program by potentially slowing the pace at which petroleum diesel is displaced. By focusing on limiting credit eligibility for specific feedstocks, the program may divert resources and attention away from more comprehensive and innovative low-carbon solutions.
- II. **Compromising Long-Term Goals:** The potential diversion of focus and resources away from broader, more effective clean energy solutions could compromise the long-term goals of the LCFS program. Ensuring that the program remains effective requires a balanced and inclusive approach that encourages the development of various low-carbon technologies and maintains momentum toward achieving comprehensive clean energy targets.
- Exclusion of Hydrogen Produced from Fossil Fuel Gas: The proposed amendment to exclude hydrogen produced using fossil fuel gas from LCFS credit eligibility, effective January 1, 2035, presents several issues:

A. Supply Constraints

I. **Drastic Reduction in Supply:** Hydrogen produced from fossil fuels, specifically through methods such as steam methane reforming (SMR), currently represents a substantial portion of the hydrogen supply in the market. This production method is well-established and forms the backbone of the existing hydrogen infrastructure. Removing this source

001.3

001.2

cont.

could lead to a significant reduction in available hydrogen, as renewable hydrogen production capacities are still developing and are not yet able to meet current demand levels.

- II. Increased Costs: With a reduced supply of hydrogen, the costs associated with hydrogen production are likely to rise. The infrastructure and economies of scale that currently support fossil-based hydrogen production are not as advanced for renewable hydrogen. Consequently, excluding fossil-based hydrogen could result in higher prices for hydrogen, which would be passed on to end-users.
- III. Market Instability: The sudden exclusion of a major hydrogen source could cause volatility in the hydrogen market, affecting not only supply but also pricing stability. This could create uncertainty for businesses and investors, potentially stalling further investments in hydrogen infrastructure.

B. Transitionary Challenges

- I. Infrastructure Development: Building the infrastructure necessary to produce, transport, and distribute renewable hydrogen at scale requires substantial time and investment. Renewable hydrogen technologies such as electrolysis are still emerging, and their infrastructure is not yet sufficient to replace fossil-based hydrogen in the short term. Excluding fossil-based hydrogen prematurely could disrupt ongoing efforts to develop this infrastructure and slow down the transition process.
- II. **Technological Advancements:** The renewable hydrogen sector is evolving, but the pace of technological advancements and cost reductions is not uniform across all areas. Immediate exclusion of fossil-based hydrogen may outpace the development and commercialization of new technologies, impeding the smooth transition to fully renewable hydrogen solutions.
- III. Strategic Planning: Energy policy should provide a gradual and strategic path towards renewable alternatives. Abrupt policy shifts can create misalignment between current capabilities and future goals, making it difficult for stakeholders to plan and implement the necessary changes effectively.

C. Consumer Impact

I. **Increased Costs:** As the supply of hydrogen decreases and production costs rise, the price of hydrogen will inevitably increase. This price hike will directly affect consumers and businesses that use hydrogen as a transportation fuel.

001.3 cont.

- II. **Impact on Decarbonization Efforts:** Many industries are investing in hydrogen technologies to reduce their carbon footprints. The increased cost and reduced availability of hydrogen could slow down the adoption of hydrogen technologies, hampering efforts to achieve broader decarbonization goals.
 - III. Economic Disruption: Higher hydrogen costs could lead to increased operational expenses for companies that rely on hydrogen as a transportation fuel, potentially resulting in higher prices for goods and services. This economic impact could be particularly severe for small and medium-sized enterprises that may struggle to absorb the increased costs.

In light of these concerns, we urge the California Air Resources Board to reconsider these proposed amendments. An effective energy transition strategy should support a diverse array of lower-carbon alternatives while balancing environmental goals with practical industry realities. Implementing a more measured and inclusive approach will help ensure a reliable, accessible, and affordable energy future for all Californians.

We welcome the opportunity to engage in further discussions and provide additional insights on these critical issues. If you have any questions, please contact Alessandra Magnasco at <u>alessandra@cfca.energy</u>.

Sincerely,

Ausola Majon

Alessandra Magnasco Governmental Affairs & Regulatory Director

001.4

001.3

cont.



October 10, 2024

LCFS staff California Air Resources Board 1001 I Street Sacramento, CA 95814

Subject: Feedback on newly proposed LCFS calculators

Dear CARB staff:

002.1 First, I would like to thank you for your work in the new LCFS calculators, which incorporate some of our previous comments. In particular, we appreciate the new hydrogen calculator, building separate calculators for biodiesel and HEFA, and increasing the number of feedstocks that can be specified in the calculators. Below are our comments on the most recent version of the calculators:

002.2 Hydrogen calculator:

Given the following inputs:

Electrolytic GH2 and/or LH2 produced with low-CI electricity.

And after entering the amount of low-CI kWh consumed, as well as the kg of GH2 and/or LH2 produced, the results show 0kg of H2 associated with B&C electricity. In the results, the entire mass of H2 produced is linked to a CI without B&C electricity.

Section 2: Pathway Inputs				
2.1 Pathway Type	SMR	Electrolysis		
2.2 Hydrogen Production	Site-Specific	🖸 Default Value		
2.3 SMR Feedstock	Natural Gas	🗖 Light Hydrocarbons		
2.4 Process Energy	 Natural Gas Grid Electricity 	Low-Cl Electricity		
2.5 Coproducts	Exported Steam			
2.6 GH2 Transport	 No GH2 Pathway Dispensed at Fuel Production Facility Trucked Direct to Fueling Station Delivered Via Hydrogen Pipeline 			
2.7 LH2 Transport	 No LH2 Pathway Dispensed at Fuel Production Facility Trucked Direct to Fueling Station Trucked via Transfill 			
2.8 Book-and-Claim (B&C)	RNG	Low-Cl Electricity		

Section 3: Static Operational Data	
3.1 Grid Electricity Region	
tricity Grid EF (gCO ₂ e/kWh)	
HC EF (gCO2e/MMBtu, HHV)	
I Electricity EF (gCO ₂ e/kWh)	125





Our Family of Brands Laura Verduzco, D.Sc. Chevron Products Company A Division of Chevron U.S.A., Inc. 5001 Executive Parkway, Suite 200, San Ramon, CA 94583 925 842 8903 laurav@chevron.com



002.2 Issues with macros in "Pathway Summary" tab:

- Cont.
- - When the user selects an electrolysis 0 pathway with liquid hydrogen and book and claim, the macros doesn't display the results correctly as it hides the B&C results for the liquid pathway. Furthermore, like in the previous point, all the H2 mass is attributed to a CI without B&C.
 - When an electrolysis pathway that 0 makes both liquid and gaseous H2 with B&C is selected, the results show CI and H2 mass values for

RNG. Although the mass of H2 for that pathway is 0, neither RNG column should in the results.

Section 2: I	Pathway Inputs
2.1 Pathway Type	C SMR C Electrolysis
2.2 Hydrogen Production	Site-Specific Operault Value
2.3 SMR Feedstock	Natural Gas Light Hydrocarbons
2.4 Process Energy	□ Natural Gas
2.5 Coproducts	Exported Steam
2.6 GH2 Transport	 No GH2 Pathway Dispensed at Fuel Production Facility Trucked Direct to Fueling Station Delivered Via Hydrogen Pipeline
2.7 LH2 Transport	No LH2 Pathway Dispensed at Fuel Production Facility Trucked Direct to Fueling Station Trucked via Transfill
2.8 Book-and-Claim (B&C)	RNG Vow-CI Electricity

Section 3: Static Operational Data		
3.1 Grid Electricity Region		
3.2. Electricity Grid EF (gCO ₂ e/kWh)		
3.3 Light HC EF (gCO ₂ e/MMBtu, HHV)		
3.4 Low-CI Electricity EF (gCO ₂ e/kWh)	125	

Hydrogen (H2) Production Quantities					
Unit Total Liquified Hydrogen (LH2)					
Total H2 Produced at Facility		kg	50	50	
		MJ, LHV	6,000	6,000	
	Produced	kg	50	50	
	T&D Loss Factor	×	2.2%	2.2%	
The object of Ech of addwag(s)	Delivered H2 for CI Calculations	kg	43	49	
		MJ, LHV	5,869	5,869	
			Vithout B&C		
	Hydrogen Reportable by Pathway	kg	50	50	

CA-GREET 4.0 Tab: The following units for the NG emissions factor are incorrect:

Natural	Gas
maturar	Jas

Combusted in Boiler or CHP 75,496 MMBtu, LHV

The correct units are gCO2e/mmBTU, LHV

There isn't an option to input sub-metered compression or regasification or to change their emission factors, as they are lumped together. Please break out each component for transparency and to make it easier for the user to substitute default values with operational data, as needed.

GH2	Compression, Precooling and Pumping	3.41	
LH2	Storage and Dispensing	4.22	





002.3 HEFA Calculator:

- HEFA Instruction Manual, Table 6, Field 5.6:
 - Confirm our understanding on the new verbiage as stated:
 - H2 used in fuel production must be directly connected to low-CI electricity sources, it cannot be book-and-claimed.
 - Book-and-claim RNG can only be used for H2 production as the feedstock, not for any other uses at the H2 production or HEFA production facility (process energy, etc.). Very specifically only for the RNG book-and-claimed for H2 as a feedstock.
- As mentioned in our previous comment letter, the field headers in Section 6 of the calculator do not match the descriptions in HEFA Instruction Manual Table 7.
 Example:
 - Calculator: 6.5 Imported Hydrogen
 - o Manual: 6.5 Alternate Fuel

	Section 6: Monthly Operational Data						
			Coproducts Exported Outside Fuel Pathway		Renewable Diesel (RD)		
	6.5	6.6	6.7	6.8	6.9	6.10	
	Imported Hydrogen	Hydrogen Produced On-Site	Light Hydrocarbons Used as H2 Feedstock	Light Hydrocarbons For Alternate Use	Beginning RD Inventory	Ending RD Inventory	
	kg	kg	MMBtu, HHV	MMBtu, HHV	gallons @ 60°F	gallons @ 60°F	

6.5 Alternate Fuel (MMBtu, HHV)	E	6.8 Light Hydrocarbons Used as H2 Feedstock (MMBtu, HHV)	E pfu sl tł
6.6 Imported Hydrogen (kg)	Ec	6.9 Light Hydrocarbons with Alternate Use (MMBtu, HHV)	E
6.7 Hydrogen Produced On- Site (kg)	E t	6.10 Beginning RD Inventory (gallons @ 60°F)	E fa
			_ ا

We request that the manual reflects the exact section numbers in the spreadsheet to avoid confusion.

The flat tailpipe CI has changed from 0.76 to 3.497 gCO2e/MJ for BD/RD (a delta of 2.74 gCO2e/MJ) due to recent data from CARB's EMFAC2021 (v1.0.2), mainly N2O increases. We request that CARB staff provide a clear and detailed explanation for assigning the same tailpipe score determined for ULSD to biodiesel and renewable diesel.





002.3 o We request that staff provide details on the assumptions driving the emission changes between the prior tailpipe emission factor of 0.76 gCO2e/MJ to the new tailpipe emission factor of 3.497. The explanation of the assumptions should be in plain language so that program participants who are not familiar with the EMFAC2021 model can understand the rationale. This explanation can be referenced in the GREET4.0 explanatory document since the relevant reference (7) is a placeholder and provides no information.

 The Simplified Calculators released for the 15-day comment period in August 2024 do not appear to have been updated with the feedstock emission factor information present in the updated CA-GREET4.0 model. The table below shows an example of the different values:

December 2023 Rele	ease	August 2024 Release	9	
Soy-Oil Based Biodiesel		Soy-Oil Based Biodiesel		
(per MMBTU)		(per MMBTU)		
Feedstock (K451)	Fuel (L451)	Feedstock (K451)	Fuel (L451)	
20,765	20,005	9,999	<mark>18,384</mark>	

Thank you very much in advance for addressing our concerns.

Best regards,

and Eler

Laura Verduzco, D.Sc. Chevron Corporation



Our Family of Brands Laura Verduzco, D.Sc. Chevron Products Company A Division of Chevron U.S.A., Inc. 5001 Executive Parkway, Suite 200, San Ramon, CA 94583 925 842 8903 laurav@chevron.com

Here is the comment you selected to display.

Comment 3 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Kevin
	Last Name	O'Neill
	Email Address	k.j.oneill@icloud.com
	Affiliation	
	Subject	Pricing
003.1	Comment	Why does your agency have so much power? Additionally, why are you raising prices on Californians yet again?

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 05:52:18

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 4 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Jessica
Last Name	Stewart
Email Address	jessicawstewart@gmail.com
Affiliation	
Subject	DO NOT INCREASE GAS PRICES
Comment	Californians cannot afford an additional \$0.65/gallon gas tax. Do not increase our currently outrageous gas tax.

Attachment

004.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 05:52:16

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 5 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Jerry	
Last Name	Jervis	
Email Address	Jerry@century21jervis.com	
Affiliation		
Subject	Stop	
Comment	Stop taxing our gas! Enough is enough!	

Attachment

005.1

Original File Name

Date and Time Comment Was Submitted

2024-10-11 06:06:24

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

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Comment 6 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Catherine
	Last Name	Kinney
	Email Address	kinney406@gmail.com
	Affiliation	
	Subject	Proposed Low Carbon Fuel Amendment
006.1	Comment	Enough is enough! We already pay more for gas than any other state in the nation. This negatively affects every single person in Californiayou are taxing us all to death

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 06:07:27

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 7 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Tim
	Last Name	Quinn
	Email Address	tq973@hotmail.com
	Affiliation	
Subject	Subject	CARB
007.1	Comment	You, the state of California, have already become the laughing stock of failed policies. Enough is enough. How do you sleep at night taking advantage of your people. You've seen what you can pull off with gasoline and appears to have doubled down on this carbon bs. Yes bs. God is watching.

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 06:07:12

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

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Comment 8 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Kelly
	Last Name	McKeown
	Email Address	mckeown.kelly@gmail.com
	Affiliation	
	Subject	Stop the ever increasing gas taxes
008.1	Comment	Enough! Please stop these insane gas taxes. They are crippling our economy. Most of us want to be good stewards of the environment, but there has to be a balance. It is shocking how unelected officials can have so much power. Please come to your senses.

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 06:10:27

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 9 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Janet
	Last Name	Saalberg
	Email Address	jsaalberg98@gmail.com
	Affiliation	
	Subject	The proposed 65 cents gas increase
009.1	Comment	Dear CARB, Californians pay the most per gallon in the nation and yet we have oil reserves in our state. I was appalled to learn of this proposal of increasing the price of gas per gallon by 65 cents. My husband and I are teachers and despite our hard work it's getting harder to afford living in our beautiful state. Do not increase our gas prices once again. The effect on all of us in
		California is so costly. Sincerely, Janet Saalberg

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 06:09:43

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 10 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	carrie
	Last Name	berg
	Email Address	berg_carrie@hotmail.com
	Affiliation	
	Subject	CARB
010.1	Comment	stop with the gas tax an raising gas prices. California is already the highest in the US and now they want to make it even higher. Please help we can't afford food or electricity and now gas.

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 06:16:03

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

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Comment 11 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Megan
	Last Name	Douthit
	Email Address	megandouthit96@gmail.com
	Affiliation	
Subject No		No
011.1	Comment	It is already exceptionally hard to justify living in California with how expensive everything is and this would put it over the top. My family cannot afford to keep living here if gas goes up by an additional \$.65. Not only will I not be able to drive anywhere but groceries will get even more expensive.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 06:16:07

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

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Comment 12 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Alan
	Last Name	Ebright
	Email Address	ebrightalan@yahoo.com
	Affiliation	Concerned citizen
	Subject	Fuel Taxes
012.1	Comment	CA policies on taxing and penalizing all companies involved in the production process has backfired wildly. This is a crusade to force adoption of EVs onto society. Overtime, adoption will happen, but what is happening now is like forcing a square peg thru a round hole. Easing the operating environment for these companies is a better direction or there will be less supply and permanently higher prices. Bad for the consumer!

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 06:11:19

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 13 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Carver
Last Name	Young
Email Address	Carveryoungother@gmail.com
Affiliation	
Subject	Gas price hike

^{013.1} Comment

California is making me broke I grew up here my whole 40 years of existence. I will never be able to afford a home here I can barely afford to eat food these days. Gas is already the highest in the nation even above Hawaii which is an island that does not produce any oil. Please stop forcing us to pay higher gas prices because you believe to know what's best for the environment. Yes I love the environment more than I love people but I can't afford it anymore. You are crushing the poor class and pushing on the chests of the middle class. You are not effecting the upper class because we know they have enough money to live 10 life times. You cannot raise the gas tax anymore. It's reached capacity.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 06:23:00

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 14 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Kristine
	Last Name	Benson
	Email Address	krissiebarker@hotmail.com
	Affiliation	
	Subject	CARB
014.1	Comment	This is absolutely the most ridiculous, power hungry play ever! I have never thought I would see a States elected officials throw a temper tantrum because they don't always get their way and then abuse the power by financially abusing its citizens!

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 06:28:56

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

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Comment 15 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Allyson
Last Name	Ramser
Email Address	ally.r.young@live.com
Affiliation	
Subject	Additional Gas Tax

015.1 Comment

I vehemently oppose any additional gas tax. Our state is an utter
disgrace. We pay the 2nd highest rates in the nation due to poor
leadership and corruption. Eventually the people will wake up and
vote you all out of office. I will do everything I can to send this
to everyone I know to send in their opposition. You cannot continue
to abuse power this way and take advantage of us in an already weak
economy. People are suffering to make ends meet and of course the
idea Newsom and all the cronies have is to tax us more. It's pure
evil.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 06:33:15

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.
Comment Log Display

Here is the comment you selected to display.

Comment 16 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Kimberly			
	Last Name	Ramser			
	Email Address	ramserkimberly@gmail.com			
	Affiliation				
	Subject	Oppose gas tax			
016.1	Comment	I strongly oppose the the new gas tax being proposed			

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 06:39:57

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Comment 17 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Nicholas		
Last Name	Prytherch		
Email Address	nicholas.prytherch@gmail.com		
Affiliation			
Subject	LCFS Community Impact		

017.1 Comment

Please stop creating initiatives that ultimately increase the end price of gasoline for Californians. We already have the highest prices in the nation because of additional tax. Prices are being continuously raised through various legislative actions, yet the Governor blames the suppliers. With the highest taxes in the nation coupled with our current housing crises, massive budget defect, homelessness crisis, and a slew of other financial woes, now is not the time to put more pressure on hardworking Californians. Stop the madness!

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 06:31:41

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Board Comments Home

Comment Log Display

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Comment 18 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Jeffrey		
Last Name	Beardsley		
Email Address	Jbturf2020@gmail.com		
Affiliation			
Subject	Additional Fees and or taxes on Fuel		

Submitted

018.1 Comment				
	Please consider a review of carbon sequestration and according the			
The rest of this	National Instories Heqlth research (see below link) "plants are			
document is an	crucial players involved in carbon sequestration". Specifically,			
article	turfgrass which captures and stores atmospheric CO2 in its plant			
discussing this	biomass (root system). Significant and detrimental air quality			
same topic	effects are occurring unchecked by the false claims of water			
	savings through mass turf reduction programs. The heat sinks and			
	carbon emissions released are simply profound!			
	I urge CARB to act in a regulatory fashion to protect the mass			
	carbon release going on today.			
	Please see the NIH article to better understand this issue.			
	Jeff Beardsley			
	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9571228/			
Attachment	www.arb.ca.gov/lists/com-attach/7610-lcfs2024-B2RSNVMgU2IAaQZo.pdf			
Original File Name	Carbon Sequestration in Turfgrass–Soil Systems - PMC.pdf			
Date and Time Comment Was	2024-10-11 06:19:54			

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

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Published online 2022 Sep 22. doi: <u>10.3390/plants11192478</u>

PMCID: PMC9571228 PMID: <u>36235344</u>

Carbon Sequestration in Turfgrass-Soil Systems

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Olga Gavrichkova, Aca	Viacheslav Vasenev, Academic Editor

Abstract

Plants are key components of the terrestrial ecosystem carbon cycle. Atmospheric CO₂ is assimilated through photosynthesis and stored in plant biomass and in the soil. The use of turfgrass is expanding due to the increasing human population and urbanization. In this review, we summarize recent carbon sequestration research in turfgrass and compare turfgrass systems to other plant systems. The soil organic carbon (SOC) stored in turfgrass systems is comparable to that in other natural and agricultural systems. Turfgrass systems are generally carbon-neutral or carbon sinks, with the exception of intensively managed areas, such as golf course greens and athletic fields. Turfgrass used in other areas, such as golf course fairways and roughs, parks, and home lawns, has the potential to contribute to carbon sequestration if proper management practices are implemented. High management inputs can increase the biomass productivity of turfgrass but do not guarantee higher SOC compared to low management inputs. Additionally, choosing the appropriate turfgrass species that are well adapted to the local climate and tolerant to stresses can maximize CO₂ assimilation and biomass productivity, although other factors, such as soil respiration, can considerably affect SOC. Future research is needed to document the complete carbon footprint, as well as to identify best management practices and appropriate turfgrass species to enhance carbon sequestration in turfgrass systems.

Keywords: greenhouse gas, soil organic carbon, biomass, photosynthesis, respiration, lawn, management, net ecosystem exchange, hidden carbon cost

1. Introduction

Carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and fluorinated gases are greenhouse gases (GHGs) that contribute to global warming. The GHG with the highest concentration in the atmosphere is CO₂, which contributed 81% of the total GHG emissions in 2018 [1]. In the ecosystem, plants are crucial players involved in carbon sequestration, which is the process of capture and storage of atmospheric CO₂. While all living organisms release CO₂ by respiration, atmospheric CO₂ only enters the terrestrial ecosystems through photosynthesis of plants [2]. Plants assimilate CO₂, store carbon in plant biomass, and contribute organic matter to soils. However, plants and soils also produce CO₂ through respiration, and terrestrial ecosystems can be net sources of CO₂ when they lose more stored carbon than CO₂ taken in through photosynthesis.

A wide range of methods and terminology is used in the carbon research literature [3,4]. Measuring changes in soil organic carbon (SOC) over a period of time is a way to determine whether an ecosystem is a net sink or source, which is often expressed in the unit of Mg C m⁻² yr⁻¹ (conversion can be made using Table 1). Net ecosystem CO₂ exchange (NEE) is another measure of whether a plant–soil system is a net sink or source of atmospheric CO₂ at an annual time step. More importantly, whether a positive or negative NEE value indicates a sink of atmospheric CO₂ needs to be specified. Over short time scales (<10 years), NEE provides a more sensitive approach for quantifying carbon sequestration than measuring changes in SOC. The fluxes of CO₂ can be measured regularly with sealed gas chambers or with eddy covariance systems to estimate annual NEE. The units of SOC accumulation rate and NEE are in either weight of elemental carbon (C) or CO₂ per area per year (Table 1).

Table 1

Carbon sequestration rate unit conversion.

Unit	To Covert Other Units to Mg C ha ⁻¹ yr ⁻¹ , Multiply by		
$Mg CO_2 ha^{-1} yr^{-1}$	0.2727		
kg CO_2 ha ⁻¹ yr ⁻¹	0.0002727		
$\mathrm{kg} \ \mathrm{C} \ \mathrm{ha}^{-1} \ \mathrm{yr}^{-1}$	0.001		
$\mathrm{kg}~\mathrm{CO}_2~\mathrm{m}^{-2}~\mathrm{yr}^{-1}$	2.727		
$\rm kg \ C \ m^{-2} \ yr^{-1}$	10		
$g CO_2 m^{-2} yr^{-1}$	0.002727		
$\rm g \ C \ m^{-2} \ yr^{-1}$	0.01		
$\rm Mg~CO_2~km^{-2}~yr^{-1}$	0.002727		

Turfgrass covers an estimated 12.8 to 20 million ha of land in the United States [5], which will likely increase with human population and urban landscape growth. Turfgrasses are broadly used for sports (golf, football, soccer, baseball, tennis, etc.), residential and commercial areas (home lawns and commercial real estate), and public municipalities (parks, schools, and roadsides). In addition to their aesthetic value and functions, Morgan et al. [2] estimated that 5 Tg (1 $Tg = 10^{12}$ g) of carbon was sequestered annually by turfgrass systems across the continental United States. Due to the higher soil carbon density relative to other land uses, residential lawns are potentially large pools for soil carbon [6,7,8]. However, maintaining high-quality turfgrass is reliant on repeated cultural practices, such as mowing, irrigation, and fertilization. Some intensively managed areas for sports, such as golf course tees and greens, as well as athletic fields, also require vertical cutting, aerification, sand topdressing, and pesticide applications. Fuel consumption and energy use for mowers and other machinery, irrigation pumps as well as production and transportation of fertilizers and pesticides for high-maintenance areas could offset the carbon sequestration benefits of turfgrass. Another concern associated with turfgrass management, like many agricultural systems, is the N₂O emissions from irrigation and fertilization, which can contribute significantly to net GHG flux [9,10,11].

Due to the large range of turfgrass uses, species, age, and management practices, as well as the environmental settings in which turfgrass is grown, turfgrass can be a net source or a net sink of GHGs. The purpose of this literature review is to provide a general understanding of turfgrass

systems, summarize current research on their climate impacts, and highlight potential ways to reduce their climate footprint. First, we describe the plant and soil components of turfgrass systems, as well as their carbon stocks and rate of carbon accumulation. Second, we compare carbon dynamics in turfgrass systems managed for different uses and compare turfgrass to other systems. Third, we summarize the key components that could affect carbon sequestration in turfgrass systems, including the age of turfgrass, grass species selection, turfgrass use, and management practices. Fourth, we provide an overview of methods used in studying turfgrass carbon dynamics for potential future research. Finally, we propose management practices that could potentially increase carbon gains and reduce carbon losses in turfgrass ecosystems.

2. Turfgrass Systems

Turfgrasses are perennial plants that have long growing seasons and form a uniform ground cover when managed properly. In the turfgrass ecosystem, the uptake of atmospheric CO₂ through photosynthesis occurs in the shoots under light, whereas respiration of the turfgrass (shoots and roots) and soil respiration contribute to the release of CO₂ under light and dark conditions (Figure 1). Unlike forage grasses, other crops, and woody plants, turfgrasses are not bred or grown for high aboveground biomass yields, which would require increased mowing inputs. Therefore, turfgrasses are expected to store smaller amounts of carbon as aboveground plant biomass [12]. An extensive root system is an important trait for turfgrass to sustain adverse stress conditions [13]. However, when root turnover rate is taken into consideration, the carbon stored in the root biomass may not be a reliable carbon pool. High turnover rates of turfgrass roots indicate that roots are rapidly decomposed and turned over approximately every two years [12,14,15]. The carbon in turfgrass systems is therefore primarily stored in the soil as organic carbon. The SOC in turfgrass soils usually decreases with soil depth, and the most rapid accumulation usually occurs near the soil surface [16,17,18,19,20].

Figure 1

Biological components of the carbon cycle in a turfgrass–soil system. Blue boxes indicate carbon gains in the turfgrass system, and gray boxes indicate carbon losses in the turfgrass system or carbon emissions to the atmosphere. This figure describes common scenarios in which clippings are returned or composted to be added back to the soil. Some rare scenarios are not described in this figure, such as when clippings are burnt and the carbon captured in clippings is released into the atmosphere.

2.1. Soil Organic Carbon Stocks

In the literature, turfgrass lawns are generally reported to be carbon sinks, with the caveat that management practices can considerably affect carbon production and storage. Fine-textured soils with high clay content are better at stabilizing SOC and reducing the rate of decomposition [21]; however, soils with high clay content are prone to compaction and are therefore not suitable for turfgrass under traffic, such as sports turf and golf courses. For this reason, sports fields, as well as golf course greens and tees, are commonly constructed using sand and typically have less SOC than lawns grown on native soils [22,23]. However, research has shown that soil texture does not always have a significant influence on SOC stocks in residential lawns [16,17,24,25].

Wide ranges have been reported for turfgrass SOC stocks due to the wide range of environmental settings in which turfgrasses are grown. Selhorst and Lal [18] reported a mean SOC stock of $45.8 \pm 3.5 \text{ Mg C} \text{ ha}^{-1}$ in various cities in the USA, ranging from 20.8 to 96.3 Mg C ha⁻¹. Another commonly used unit in the literature for SOC stocks is kg m⁻²; for consistency with carbon sequestration rates reported in Mg C ha⁻¹ yr⁻¹, SOC stocks were converted to Mg C ha⁻¹ by multiplying kg m⁻² by 10 (1 kg m⁻² = 10 Mg ha⁻¹). In line with the study by Selhorst and Lal [18], studies on mature residential lawns have also reported a wide range of carbon stocks of 155 [26], 108.3 [24], 69.5 [20], 65.0 [27], 50.2 [17], 38.6 [16], and 19.7 Mg C ha⁻¹ [28]. Pouyat et al. [6] compiled data from multiple cities and estimated mean SOC stocks of 71 and 144 Mg C ha⁻¹ for parks and residential turfgrass, respectively. In New Zealand, Weissert et al. [29] reported a SOC stock of 48 Mg C ha⁻¹ for urban parklands. When surveying 13 golf courses in southeastern suburbs of Melbourne, Australia, Livesley et al. [30] reported that SOC density varied from 49.8 to 147.5 Mg C ha⁻¹ in rough and fairway soils. Other urban turfgrass soils (including park lawns, campus lawns, roadside turf, and athletic fields) were also reported as SOC stocks of 13–49 Mg C ha⁻¹ to 15 cm depth [31] and 106–262 Mg C ha⁻¹ to 1 m depth [32].

Despite the wide range in SOC stocks reported for turfgrass, studies have shown much more similar SOC stocks in residential lawns than in natural vegetation (such as forests, grasslands, and desert ecosystems depending on the climate) in cities with distinct climates [7,33]. For example, similar SOC stocks were reported between Baltimore, MD (110 Mg C ha⁻¹), and Denver, CO (127 Mg C ha⁻¹), residential turfgrass soils, likely due to the greater management efforts in the Denver region to offset the constraint of the dry climate [7]. In arid climates, turfgrass is often reported to have higher SOC stocks than native vegetation [7,33,34,35]. A study conducted on urban land use in Phoenix, AZ, also concluded that mesic landscaping with well-watered turfgrass was a net CO₂ sink [36]. However, such studies highlight a tradeoff between water resources and the potential carbon sequestration benefits of turfgrass. While turfgrasses can accumulate large SOC stocks in arid climates, they require irrigation and other management practices. Using the CENTURY model to simulate turfgrass systems, Trammell et al. [37] demonstrated that management practices could be a potential driver for SOC accumulation. Research on turfgrass management practices is summarized and discussed separately in another section of this review.

2.2. Biomass and Net Primary Productivity

High SOC stocks in turfgrass systems are driven by high carbon inputs from plant biomass [38,39]. Newly seeded turf rapidly increased biomass carbon stocks; both aboveground and root biomass (1.8–3.4 and 1.0–2.2 Mg C ha⁻¹, respectively) at three years after establishment were more than double the amount of biomass compared to one year after establishment [40]. Despite rapid growth rates, the amount of carbon stored in the turfgrass biomass was relatively low (2.4 [28] and 2.4–6.0 Mg C ha⁻¹ [41]). Kong et al. [31] reported 0.5–2.1 Mg C ha⁻¹ stored in turfgrass aboveground biomass as opposed to 12.6–48.9 Mg C ha⁻¹ in the turfgrass soils.

Net primary productivity or production (NPP) is a measure of carbon inputs into an ecosystem. NPP can be calculated as the sum of the positive increments in the standing biomass, which requires periodic sampling. Falk (1980) proposed a calculation for NPP that uses turnover rates to estimate biomass production [15].

$$NPP = \sum clippings + stubble_{max} \times \theta_{S} + root_{max} \times \theta_{R}, \qquad (1)$$

In this equation, NPP is the sum of the total clippings collected at each mowing, stubble production, and root production. Stubble or root production is calculated by multiplying maximum biomass (stubble_{max} or root_{max}, respectively) by a turnover rate for stubble (θ_S or θ_R , respectively). In that study, root and stubble turnover rates were measured, and an average NPP of 16.5 Mg ha⁻¹ was reported in dry weight for lawns [15]. Qian et al. [42] also reported biomass allocations of 4.70, 3.37, 8.08, and 3.25 Mg ha^{-1} in biomass dry weight for clippings, verdure, thatch, and roots, respectively. Based on Equation (1) and turnover rates reported by Falk [14,15], Qian et al. [42] reported an NPP of 12.6 Mg ha⁻¹ in biomass weight. However, these studies reported NPP in biomass dry weight; the amount of carbon in the biomass was not quantified and can vary depending on tissue type. The NPP rates in biomass weight can be converted to Mg C ha⁻¹ yr^{-1} by multiplying by the appropriate carbon content (%) of each tissue type. For example, Golubiewski [34] reported that the carbon content of harvested clippings was 44.7% by weight. In another study, total standing biomass of a tall fescue [Festuca arundinacea Schreb. = Schedonorus arundinaceus (Schreb.) Dumort.] lawn averaged 6.04 Mg C ha⁻¹ with slightly more carbon in roots than in stubble, and NPP averaged 4.50 Mg C ha⁻¹ yr⁻¹ [43]. Using a modeling approach, Milesi et al. [5] reported a wide range of NPP values from 0.22 to 10.6 Mg C ha⁻¹ yr⁻¹ associated with different management regimes.

It was unclear how much carbon was in thatch biomass in early turfgrass carbon research (for example, research by Falk in 1980 [15]), in which thatch might not be separated from other plant tissues when measuring standing biomass. This likely occurred because thatch was less commonly observed in older turfgrass cultivars (except for intensively managed areas, such as golf course putting greens). Benefiting from advances in turfgrass breeding, modern cultivars are denser and more aggressive in lateral growth than older cultivars [44]. Due to high plant density and lack of soil disturbance, turfgrass usually develops a distinct thatch or organic matter layer (Figure 2). Thatch in turfgrass has been defined as a layer of dead and living stems and roots that accumulates faster than decomposition between the green vegetation and the soil surface [45]. A study in 2020 reported that thatch built up rapidly after turfgrass establishment and contributed to carbon accumulation in turfgrass systems [46]. Turfgrass thatch layers have a higher carbon concentration (due to a higher lignin content) than verdure, roots, and underlying soils [47,48]. Therefore, thatch is a potential carbon pool in turfgrass systems [39,46,47].

Figure 2

Turfgrass thatch development (approximately 2–3 cm as shown) in different turfgrass systems: creeping bentgrass (*Agrostis stolonifera*) maintained at a golf course fairway height (**left**), fine fescue (*Festuca* sp.) maintained as a lawn (**middle**), and tall fescue (*F. arundinacea*) maintained as a lawn (**right**).

Despite the fact that thatch layers are commonly observed in turfgrass systems, carbon studies vary as whether to include the thatch layer in determining SOC or total system carbon. The thatch layer has a comparable carbon content to that of soil [46,47]; therefore, this layer can also be a pool for carbon. A few studies have reported the carbon sequestration potential in thatch layers [39,42]. Thatch is commonly not included in soil carbon sequestration calculations [18,38,49,50,51]. Thatch has distinct physical and chemical properties different from verdure or roots. In Kentucky bluegrass (*Poa pratensis* L.) (rhizomatous), Qian et al. [42] separated thatch from verdure and roots and reported an annual thatch production (biomass of thatch × thatch turnover) of 4.362 Mg dry weight ha⁻¹. Thatch has similar lignin content to that of roots and was therefore included as belowground biomass production [42]. Conversely, thatch and verdure have also been considered aboveground biomass [38,52]. Thatch can account for a substantial portion of the standing biomass, depending on grass species (more discussion is provided in a later section). However, thatch contributes to the softness of athletic fields; therefore, athletic fields require renovation and thatch removal to provide firm and smooth surfaces for the safety of players [53,54].

2.3. Ecosystem Respiration

Accumulation of carbon in turfgrass systems is controlled, in part, by carbon losses through respiration. The total plant, animal, and microbial respiratory loss of carbon from the ecosystem in the form of CO₂ is defined as ecosystem respiration (R_{eco}). Also referred to as total respiration, R_{eco} is composed of autotrophic respiration (R_a) from plants and heterotrophic respiration (R_h) from microbes and animals. Kong et al. [31] reported a lower R_{eco} (4.23 to 8.84 µmol m⁻² s⁻¹) in the dry season and higher rates (7.45 to 20.26 µmol m⁻² s⁻¹) in the wet season in Hong Kong. In a Singapore urban turfgrass system, Ng et al. [55] reported an R_{eco} rate of 7.9 µmol m⁻² s⁻¹, and R_a contributed a substantial portion. Simply converting respiration rates reported in µmol CO₂ m⁻² s⁻¹ to an annual rate in Mg C ha⁻¹ yr⁻¹ is not appropriate if CO₂ fluxes were only measured periodically or from a partial year because soil fluxes can vary considerably within a year. Song et al. [56] also reported a wide range of R_{eco} rates depending on mowing height and air temperature. Fertilization can also increase R_{eco} associated with turfgrass lawns [57]; whether elevated R_{eco} rates are the result of higher soil respiration or higher R_a from increased plant biomass in response to fertilization needs to be further investigated.

Ecosystem respiration can be equivalent to soil respiration in ecosystems without plants (such as bare soil) or in which plants (or plant parts) were removed when measuring respiration. However, many studies have not specified whether respiration from plants (R_a) was included in soil respiration measurements. Studies quantifying respiration with sealed gas chambers have suggested that soil respiration contributes to CO₂ emissions, also known as biogenic emissions, in turfgrass systems [29,40,55,58,59,60]. A few studies continuously surveyed CO₂ fluxes for more than one year and calculated annual soil respiration rates of 10.5 [59], 9.2 [28], and 4.58 Mg C ha⁻¹ yr⁻¹ [61], which were converted to Mg C ha⁻¹ yr⁻¹ using Table 1 for ease of comparison to SOC accumulation rates. Using a modeling approach, R_h was estimated to be 0.31–1.21 Mg C ha⁻¹ yr⁻¹ with minimal management (mowing only as needed) and 1.38–9.22 Mg C ha⁻¹ yr⁻¹ under other management regimes on a nationwide scale in the USA [5]. Soil respiration from plant systems, including turfgrass, varies both spatially and temporally and can account for a substantial portion of urban carbon emissions [60]. Biogenic emissions measured from turfgrass soils were substantially higher than the fuel emissions from mowing [28,61].

Turfgrass thatch is a porous layer with stems and roots that also harbors macro- and micro-organisms [62,63] and is therefore expected to have a high respiration rate. Although the effects of turfgrass thatch on carbon sequestration are not fully understood, Raturi et al. [47] suggested significant differences in microbial biomass carbon between thatch and the soil underneath. Interestingly, thatch had higher microbial biomass carbon and lower carbon loss through maintenance respiration, suggesting that turfgrass thatch was acting as a temporary carbon sink, whereas the reduced microbial biomass and increased maintenance respiration associated with soils suggested that soils under thatch serve as sources of atmospheric CO_2 [47]. Nevertheless, soil respiration is an important process for soil nutrient cycling and can serve as an indicator of microbial activities. Soil respiration from turfgrass systems was reported to be higher than that from bare soil [55,59,64], gravel mulch [65], and agricultural soils [35,64,66], indicating relatively higher microbial activities in turfgrass soils. Soil respiration rates measured in turfgrass systems are also comparable to other natural or managed ecosystems (Table 2) and were shown to be affected by soil temperature and moisture [29,59].

Table 2

Carbon sequestration in turfgrass systems compared with other systems.

Reference	Location	Comparison *			
Carbon gain in the system					
Acuña E. et al. [<u>50</u>]	Central Chile	SOC: turfgrass > bare soil			
Bae and Ryu [<u>59</u>]	Seoul, South Korea	SOC: mixed forest > wetland > lawn > bare soil			
Upadhyay et al. [<u>64</u>]	Varanasi, India	SOC: urban plantation \approx lawn> agriculture \approx grassland > bare soil			
Bowne and Johnson [66]	Elizabethtown, PA, USA	SOC: lawn \approx corn field			
Burghardt and Schneider [26]	Ruhr, Germany	SOC: vegetable garden \approx lawn > meadow			
Byrne et al. [<u>65</u>]	Central PA, USA	SOC: lawn \approx bark > unmanaged vegetation> gravel			
Campbell et al. [27]	Virginia, USA	Soil carbon: forest \approx lawn			
Golubiewski [<u>34]</u>	Colorado, USA	SOC: turfgrass ≈ tree SOC: urban green space > native grassland > agricultural field			
Huyler et al. $[67]$	Auburn, AL, USA	SOC (only at 0–15 cm): lawn with tree > lawn without			

* Systems were ranked from high to low; \approx indicates that the former had a higher mean or median but was not statistically different from others at *p* < 0.05 level. SOC, soil organic carbon; ANPP, aboveground net primary productivity; R_s , soil respiration.

2.4. Hidden Carbon Cost and Net Greenhouse Gas Emissions

Although turfgrass systems continuously assimilate atmospheric CO₂ through photosynthesis and accumulate SOC, there are concerns about turfgrass maintenance emissions, which can shift turfgrass systems from being carbon sinks to carbon sources [10,19,23,31]. Hidden carbon costs (HCCs) and net GHGs are expressed as CO₂ equivalents (CO₂-e) and are occasionally reported as C equivalents (C-e) in the literature, which are calculated by multiplying CO₂-e values by 0.2727 (molecular weight of C/molecular weight of CO₂). Some studies have estimated HCCs and GHGs in established turfgrass systems, accounting for fuel, irrigation, fertilization, and N₂O emissions [23,72]. Zhang et al. [72] also included HCCs from production and transportation of pesticides, which accounted for the smallest portion among other factors. Two major types of turfgrass systems are lawns and golf courses, which can vary considerably in HCCs and net GHG emissions and are therefore discussed in detail in the following two sections.

Nitrous oxide (N₂O) has a global warming potential (GWP) 298 times that of CO₂. In turfgrass systems, N₂O emissions related to fertilization and irrigation are a major component of net GHGs. Braun and Bremer [11] provided an in-depth review of N₂O emissions in turfgrass systems and compared them to other crops and ecosystems. For the purpose of this review, we focus on the carbon cycle. Research on CH₄ in turfgrass systems is limited, although a few assessments have indicated that CH₄ fluxes are relatively small, except for during or immediately after rain or irrigation events [9,22]. Turfgrass systems are generally reported to be CH₄-neutral or sinks [9,10,68,70,71].

2.4.1. Lawns Selhorst and Lal [18] demonstrated that lawns across the USA are potential sinks for atmospheric CO₂; however, standard lawn management practices of mowing and fertilization contributed to HCCs of 0.190 and 0.064 Mg C-e ha⁻¹ yr⁻¹, respectively. Furthermore, Kong et al. [31] provided detailed HCCs of fuel use, electricity, irrigation, pesticides, and fertilizers associated with urban lawn maintenance, which contributed a total of 1.7 to 6.3 Mg C-e ha⁻¹ yr⁻¹ in carbon emissions. Such high HCCs can offset the carbon sink capacity of turfs in 5–24 years [31].

Ornamental lawns were reported to accumulate SOC at a rate of 1.40 Mg C ha⁻¹ yr⁻¹, which is greater than the GWP of N₂O emissions in that system [23]. Therefore, the authors reported lawns sequestered CO₂ at the rate of 0.29 Mg C-e ha⁻¹ yr⁻¹ under a low fertilization scenario (10 g N m⁻² yr⁻¹) after accounting for measured N₂O emissions and estimated CO₂ emissions generated by fuel combustion, fertilizer production, and irrigation [23]. However, under a high fertilizer scenario (75 g N m⁻² yr⁻¹), lawns were estimated to contribute to a carbon loss of 0.78 Mg C-e ha⁻¹ yr⁻¹. However, the 75 g N m⁻² yr⁻¹ of fertilizer applied to lawns is almost four times higher than the fertilization rate recommended by the local university extension office [73] and therefore not realistic. The reported net GHG also took N₂O emissions into account, which were estimated to be 0.1 to 0.3 g N m⁻² yr⁻¹, depending on the fertilization rate and, when converted to GWP, resulted in +0.123 to +0.395 Mg C-e ha⁻¹ yr⁻¹ [23]. Similarly, Gu et al. [10]

reported that carbon sequestration by turfgrass lawns was offset by N_2O emissions and HCCs to maintain turfgrasses. In another case in Australia, when converting a well-established pasture to a turfgrass lawn, the turfgrass system was reported to produce net GHG emissions of 0.415 Mg CO_2 -e ha⁻¹ (0.113 Mg C-e ha⁻¹) in the first 80 days after conversion [9]. Therefore, understanding each plant–soil system is of great importance, and land conversion should be carefully considered.

2.4.2. Golf Courses Golf courses are unique turfgrass systems in which highly managed putting greens and tees account for only 5% of the average maintained turf acreage of 111.5 acres, whereas fairways and roughs account for 28.6% and 60% of golf course acreage, respectively [74]. Fairways and roughs are potential carbon sinks if such large-acreage turfgrass areas are managed with low inputs. For example, a golf course fairway turf in Manhattan, KS, was reported to have an average carbon sequestration rate of 1.01 Mg C ha⁻¹ yr⁻¹ [75]. In central Ohio, fairways and roughs were estimated to have sequestration rates of 3.55 and 2.64 Mg C ha⁻¹ yr⁻¹, respectively [19]. Large areas of fairways and roughs contributed to carbon sequestration, which offset the net emissions from greens and tees, with a net sequestration rate of the whole course of 1.47 and 0.44 Mg C-e ha⁻¹ y⁻¹ for a Parkland course and a Links course, respectively [76]. Additionally, naturalized roughs on golf courses are unmanaged areas covered by turfgrasses or a mixture of turfgrasses and other plants, which often do not require management inputs (no HCC). Despite the increasing popularity of such naturalized areas, owing to their environmental benefits [77,78], their carbon sequestration potential is largely unknown. We speculate that carbon stored in unmanaged roughs would be similar to that in the meadow-like lawns studied by Poeplau et al. [79] or unirrigated and mowed-as-needed roughs investigated by Qian et al. [38], which had less SOC than managed turfgrass areas. Studies in which the carbon budget for entire golf courses was calculated reported that golf courses were potential carbon sinks $[\underline{76,80}]$.

However, the emissions generated by maintenance can offset the carbon sequestration of turfgrass and trees on golf courses and should not be neglected. Selhorst and Lal [19] estimated large carbon losses (estimated 0.30 Mg C-e ha⁻¹ yr⁻¹) associated with maintenance practices, shifting golf courses from being carbon sinks to carbon sources within 30 years. The HCCs considered in their study included fertilizers, herbicides, insecticides, fungicides, irrigation, unleaded gasoline, and diesel fuel, with the highest HCC from diesel fuel combustion [19]. Bekken and Soldat [81] surveyed golf courses in the northern USA and estimated the total GHG emissions associated with maintenance to be 1.17 Mg C-e ha⁻¹ yr⁻¹, including onsite emissions (primarily fuel use), offsite emissions (primarily offsite electricity generation), and supply chain (upstream) emissions (primarily from the production and transport of machines, fertilizers, pesticides, etc.). Additionally, a few studies have reported detailed energy use and GHG emissions from management practices on greens, tees, fairways, and roughs [19,76,80,82]. Intensively managed turfs, such as golf course greens, consume energy and emit CO₂ [76,80]. Carbon losses from turfgrass systems are often expected when aboveground tissues and underground organic matter are removed. Daily mowing with clippings removed when grasses are actively growing is a standard practice for golf course greens and tees [83]. In addition to removal of clippings by mowing, cultivation, including verticutting to remove grass tissues and hollow-tine aerification to physically remove plant materials and organic matter, is likely to reduce the carbon pool in turfgrass systems. Other practices, such as solid-tine aerification and topdressing, add sand to the soil profile without removing organic matter and plant material [62]. Such practices dilute the organic matter in the root zone profile to promote better growth of turfgrass and are therefore unlikely to reduce the productivity of turfgrasses. Research has been limited on the cultivation effects on the NPP and SOC of turfgrass, and the net carbon budget needs to be analyzed accounting for the HCCs of cultivation machine operations.

3. System Comparison

With increasing population and urbanization, vegetation and soil in the urban landscape are unable to balance the carbon emissions from human activities [84]. In urban landscapes, turfgrass helps to stabilize the soil, prevent wind and water erosion, and build up organic matter [85]. Urban turfgrass systems have received more carbon sequestration research attention compared to other turfgrass systems. Research on a nationwide scale in the USA has suggested that turfgrass systems in the urban landscape are potential carbon sinks [5, 6, 8, 18, 86], whereas many other studies have been conducted on smaller scales, such as cities, residential blocks, and individual lawns. Research by Qian and Follett [21] indicated the significance of turfgrass in carbon sequestration, which was comparable to USA lands in the Conservation Reserve Program. Gordon et al. [87] published a letter to the editor comparing turfgrass systems with other systems and concluded that turfgrasses are able to sequester CO₂ at a rate similar to that of land used for agricultural and forestry practices, although carbon stored in the recalcitrant soil carbon pool is considered to be very limited due to the high turnover rate. In contrast to the large number of urban studies, very limited information is available on the carbon balance in agriculture systems where turfgrass sod and seeds are produced. Pahari et al. [88] reported that a warm-season turfgrass sod farm sequestered CO₂ at a rate of 4.51–5.15 Mg C ha⁻¹ yr⁻¹. Research on the carbon footprint of turfgrass seed production is lacking.

Vegetative components of urban landscapes consist of trees, shrubs, herbaceous plants, and grasses. Comparing the impact of different urban landscape vegetation on carbon sequestration can be challenging for many reasons. Biomass can be directly measured in turfgrass systems, whereas it is often not feasible to harvest and measure above- and belowground biomass in systems with trees; instead, models are often used to estimate the biomass of trees. In addition, urban landscapes often receive carbon inputs on one landscape type from other onsite vegetation (such as tree leaves falling on a lawn) or from outside sources (such as compost additions in the urban landscape), making it difficult to derive the source of carbon in each system. Collecting

data on two city blocks in Chicago, Jo and McPherson [12] concluded that larger carbon pools were stored in woody vegetation, such as trees and shrubs, compared to the intermediate pools of vegetation of turfgrass plants and no carbon storage in the herbaceous plants, whereas the majority of the carbon was stored in the soil (78.7% and 88.7% for the two blocks).

Soil organic carbon in the urban environment has also been explored (Table 2). Soil samples collected under tree canopies were shown to have higher SOC than samples from golf course fairways [30], whereas similar SOC values were observed between soils of turfgrass and trees in an urban landscape study [34]. Interestingly, lawns with trees were shown to have higher SOC at the 0–15 cm depth but similar SOC at soil depths of 15–30 cm and 30–50 cm when compared to lawns without trees [67]. These findings are contrary to the hypothesis that trees are expected to influence SOC at deeper soil depths because they have deeper root systems than turfgrasses. The authors also implied that turfgrass would be the main contributor to SOC at 0-15 cm [$\frac{67}{1}$]; therefore, one speculation is that tree canopies may have provided cooler and less stressful conditions than the full sun (possible heat stress environment) for turfgrass growth in the southern USA, where the study was conducted. A study in Auckland, New Zealand, compared ten urban forests dominated by trees with six urban parklands dominated by grasses; the authors concluded that the SOC was higher in the grass-dominated landscape (48 Mg ha^{-1}) compared to the tree-dominated landscape (27 Mg ha⁻¹) in the upper 10 cm [29]. Similarly, soil carbon density in the top 100 cm of residential soils was reported to be higher than in forest soils of similar types in a study conducted in Baltimore, MD [20].

Another landscape option is to grow non-turf herbaceous plants. A study in Germany sampled soils from 14 vegetable gardens and 13 lawns, revealing that vegetable patches contained a mean SOC stock of 164 Mg ha⁻¹ and lawns contained 155 Mg ha⁻¹ in the top 30 cm of soil compared to four samples from a local meadow, which contained 111 Mg ha⁻¹ [26]. However, the ability to compare the SOC stock data between vegetable patches and lawns is complicated by the fact that lawn clippings and garden debris are often composted and later placed on vegetable patches. Vegetable gardens and mulch beds are common urban land cover options; such soils receive carbon additions, such as compost and wood mulch, and no differences were reported in SOC between these land covers and turfgrass [26,65,68].

Many research studies have compared turfgrass systems to adjacent ecosystems (<u>Table 2</u>). Higher SOC values in turfgrass systems compared to native grassland systems have been reported in numerous studies [7,26,34,35,64]. Moreover, lawns often have higher SOC values than agricultural soils [34,35,64,69], with the exception of one report showing similar SOC values between lawns and corn fields [66]. However, research conclusions in the literature are inconsistent when comparing forest with turfgrass ecosystems (<u>Table 2</u>). Forests are more complicated systems for

carbon stocks, depending on the tree species (for example, deciduous broadleaf vs. evergreen needleleaf) and climate. Wildfire is another major concern with respect to carbon loss in forest ecosystems [89].

Comparing turfgrass sites to bare soil, Acuña E. et al. [50] reported that SOC increased over a 26-month period with nine turfgrasses in Chile, whereas the SOC in bare soil decreased (likely the labile SOC pool). This is consistent with other studies reporting higher SOC in lawns compared to bare soil [59,64]. Lawns also have higher soil respiration rates compared to bare soil [55,59,64]. Soil respiration, i.e., the process of releasing CO₂ back to the atmosphere, represents a carbon loss from the plant–soil system. However, Bae and Ryu [59] reported that high soil respiration was correlated with high SOC stocks when comparing various systems: mixed forest, deciduous broadleaf forest, evergreen needleleaf forest, lawn, wetland, and bare land. One speculation is that high soil respiration is an indication of high microbial activities, which recycles nutrients from plant litter, subsequently adding carbon to the soil. Therefore, soil respiration alone cannot be the sole indicator of the net carbon balance of an ecosystem.

Higher soil respiration rates of lawns compared to agriculture lands and grasslands have been consistently reported in the literature [35,64,66]. There is no general agreement when comparing lawns with forests, likely due to spatial and temporal variations (Table 2). Wood-chip- or bark-mulched beds were shown to have similar high soil respiration rates relative to lawns [65,68]; such systems without plants do not have any carbon inputs from photosynthesis.

4. Age of Turfgrass

Numerous studies have reported higher SOC associated with older turfgrass systems, indicating the accumulation of SOC. Studies reporting SOC accumulation rates in turfgrass systems of varying ages are summarized in Table 3, which does not include studies utilizing model simulations (discussed in a separate section) or studies measuring SOC over time with repeated measurements. Carbon accumulation rates reported in studies with repeated measures over time were reported as 1.408 and 1.629 Mg C ha⁻¹ yr⁻¹ for Kentucky bluegrass and tall fescue, respectively [52]; 1.01 Mg C ha⁻¹ yr⁻¹ for zoysiagrass (*Zoysia japonica* Steud.) [75]; and 0.32, 0.74, and 0.78 Mg C ha⁻¹ yr⁻¹ for Kentucky bluegrass, fine fescue mixture (*Festuca* spp.), and creeping bentgrass (*Agrostis stolonifera* L.), respectively [38]. Soil total carbon accumulates over time; however, the ability of turfgrass systems to sequester and store carbon is not unlimited. Studies reported that carbon was linearly accumulated beneath turfgrasses over 33 years at a rate of 1.4 Mg C ha⁻¹ yr⁻¹ [23], 44 years at a rate 0.82 Mg C ha⁻¹ yr⁻¹ [20], 40 years at a rate of 0.69 Mg C ha⁻¹ yr⁻¹ [90], and 100 years at a rate of 0.30 Mg C ha⁻¹ yr⁻¹ [25]. As turfgrass

ages, carbon is expected to reach an equilibrium in the system. Research has shown that initial SOC accumulation is greatest when turfgrasses are newly established; then, carbon sequestration rates decline as turfgrass systems age [10,21,42,49,91,92].

Table 3

Soil organic carbon (SOC) accumulation rates reported in previous studies.

Reference	Turf Use	Location	Turf Age (Year)	Soil Depth (cm)	Regression Response	Number of Years to Reach Max SOC *	SOC Accumulation Rate (Mg C ha ⁻¹ yr ⁻¹)
Townsend- Small and Czimczik [23]	Lawn	Irvine, CA	2–33	20	Linear	33	1.4
Raciti et al. [<u>20]</u>	Lawn	Baltimore, MD	4–44	100	Linear	44	0.82
Smith et al. [<u>25</u>]	Lawn	Salt Lake City, UT	7–100	40	Linear	100	0.30
Sapkota et al. [<u>93</u>]	Lawn	Lubbock, TX	0–63	10	Quadratic	53.6	0.21
Huh et al. [<u>90</u>]	Green	Palmerston North, New Zealand	5-40	25	Linear	40	0.69

* For studies in which SOC increased linearly and hyperbolically, the max SOC was reached in the oldest reported system. Numbers in parentheses indicate soil depths.

The rate of carbon accumulation and the time it takes for turfgrass systems to reach maximum carbon storage vary among turfgrasses depending on use (Table 3). Qian and Follett [21] analyzed the soil data of golf courses between the ages of 1.5 and 45 years and reported that rapid carbon sequestration occurred during the first 25 years after turfgrass establishment, at average rates of 0.9 to 1.0 Mg C ha⁻¹ yr⁻¹ to the 11.4-cm depth. In that study, soil carbon was reported to increase for approximately 45 years in putting greens and 31 years in fairways, as putting

greens are established on sand with very low initial soil organic matter [21]. Other studies on putting green turf reported that SOC accumulation increased linearly in the top 25-cm soil at a rate of 0.69 Mg C ha⁻¹ yr⁻¹ for 40 years [90] and hyperbolically in the top 7.6-cm soil at a rate of 0.59 Mg C ha⁻¹ yr⁻¹ for 25 years [91]. Two studies on bermudagrass (*Cynodon* spp.) fairways also suggested a decreasing rate of carbon accumulation over time [49,94]. Soil carbon in the top 15 cm of fairways increased hyperbolically as accumulation rates declined from 6 Mg C ha⁻¹ yr⁻¹ to less than 0.5 Mg C ha⁻¹ yr⁻¹ in the first 20 years [94]. Gautam et al. [49] reported that soil carbon in the top 7.5 cm of fairways was accumulated at a rate of 0.22 Mg C ha⁻¹ yr⁻¹ and reached equilibrium after 46.4 years, whereas the 7.5–15 cm soil continued to sequester carbon for up to 62.5 years. Similarly, the time to attain equilibrium increased with an increase in soil depth; the time for the 0–2.5 cm soil of fairways and roughs to reach equilibrium was 14 and 12 years, respectively, whereas, the 10–15 cm soil depth was able to sequester carbon for up to 81 and 91 years, respectively [19].

Low rates of SOC were reported in residential lawns, with a linear accumulation of 0.29 Mg C $ha^{-1} yr^{-1}$ at the 0–40 cm depth over the 100-yr chronosequence [25] and with a quadratic increase of 0.21 Mg C ha⁻¹ yr⁻¹ at the 0–10 cm depth for 53.6 years [93]. With 16 home lawn sites studied, Selhorst and Lal [18] revealed a wide range of SOC sequestered at the 0–15 cm depth, ranging from 0.9 to 5.4 Mg C ha⁻¹ yr⁻¹, depending on location. Land-use histories also alter the ability of residential lawns to sequester carbon. For instance, Raciti et al. [20] reported a rate of 0.82 Mg C ha⁻¹ yr⁻¹ accumulated in residential sites built on agricultural land but no correlation between age and SOC in lawns developed on forest land. One explanation they proposed is that residential lawns established on former forest land had higher initial soil carbon than those established on former agricultural land [20]. Campbell et al. [27] suggested that converting unmanaged Appalachian hardwood forests into managed residential lawns resulted in little change in the soil carbon of the upper 30 cm depth they sampled. Therefore, converting forests to residential lawns may not have any benefits with respect to SOC sequestration. Landuse history and land conversion are of considerable research interest; future meta-analysis is needed to elucidate the effects of land-use histories on carbon sequestration for decision making regarding land conversions.

Although numerous reports discussed above indicate that SOC accumulation rates decrease over time in turfgrass systems, there is no evidence of a notable decrease in turfgrass growth and carbon production. Shi et al. [94] summarized research results and implied that increased rates of soil organic matter degradation as turfgrass systems age are due to microbial activity. In support of this theory, microbial biomass and activity were found to be positively correlated with the accumulation of soil organic matter in aging turfgrass systems [95,96,97]. Although the accumulation rate seems to decrease, soil organic matter becomes more recalcitrant as turf increases in age [97].

In residential lawns, the accumulation of soil carbon over time is often reported in reference to the age of the home because house age is often an indicator of time since soil disturbance. In Salt Lake Valley, UT, SOC was reported to increase linearly with house age from 7 to 100 years [25]. In Manchester, NH, soil carbon stocks at 0-10, 10-20, 20-30, and 30-40 cm were positively correlated with house age [24]. In Colorado's Front Range, residential sites >7 years had higher soil carbon concentrations in the surface soils (0-10 cm) than sites <7 years old, and homes >25 years in age had higher soil carbon concentrations in the subsurface soils (10-20 cm)and 20–30 cm) than homes <25 years in age [34]. In Auburn lawns, soil carbon accumulated at low rates in the 0–15 cm depth (0.21 to 0.26 Mg C ha⁻¹ yr⁻¹) compared to other residential turfgrass studies, with no relationship with home age observed at the 15–30 and 30–50 cm depths [16,17]. In Montgomery County and Roanoke County, VA, Campbell et al. [27] reported a positive correlation between soil carbon concentration in the top 0-5 cm and time since residential parcel development (2-52 years). In an analysis of SOC data from 16 sites across the USA, Selhorst and Lal [18] indicated that home lawns did not have the benefit of sequestering carbon between 66 and 199 years with standard management practices, however, reduced inputs could further extend the time before emissions would cancel out sequestration.

In summary, turfgrass systems can accumulate SOC for 25 years or more (<u>Table 3</u>). Apart from being limited by the soil carbon capacity, turfgrass sites can deteriorate overtime due to pests, diseases, and weed invasion, which could contribute to a reduced sequestration rate. It is still unclear whether overseeding (with minimal soil disturbance) can affect carbon sequestration and extend the number of years for turfgrass systems to reach their carbon sequestration and storage capacity; therefore, future research is warranted.

5. Grass Species Selection

Many perennial grass species in the Poaceae family are used as turf and are adapted to a wide range of climates. Carbon stocks and sequestration rates can differ among turfgrass species. Acuña E. et al. [50] reported a range of SOC sequestration rates of 0.1–0.9 Mg C ha⁻¹ yr⁻¹ among turfgrass species tall fescue, strong creeping red fescue (*F. rubra* L. ssp. *rubra*), common bermuda (*C. dactylon* L.), hybrid bermuda (*C. dactylon* L. × *C. transvaalensis* Burtt Davy), Kentucky bluegrass, rough bluegrass (*P. trivialis* L.), and perennial ryegrass (*Lolium perenne* L.) in central Chile. By measuring seasonal physiological parameters, the authors found that in the summer, common bermuda (a C4 species) had high CO₂ assimilation rates, low stomatal conductance, and high photosynthetic water use efficiency, which was calculated as the ratio between the simultaneously measured carbon gain in photosynthesis and water loss in transpiration. In the same study, tall fescue (a C3 species) maintained constant photosynthetic activity across all seasons. Both turfgrass species were shown to be promising species to increase carbon sequestration and to better use irrigation water in central Chile [50]. In another study, zoysiagrass was reported to have the highest mean levels of sequestered total carbon in biomass and soil when compared to other warm-season grasses (C4) for lawns, likely due to relatively higher shoot density [39]. In that study, zoysiagrass was reported to sequester carbon at a rate of 5.54 Mg C ha⁻¹ yr⁻¹ compared to 2.09 and 4.23 Mg C ha⁻¹ yr⁻¹ for hybrid bermuda and centipedegrass [*Erecholmoa ophroides* (Munroe) Hack.], respectively [39]. Turfgrass species with high shoot density are likely better at assimilating atmospheric CO₂ (increased carbon inputs into the turfgrass–soil system). Therefore, high aboveground NPP is often correlated with high SOC [79]. On the other hand, high root biomass or high carbon allocation to root biomass likely contributes to greater SOC stocks [98,99]. This relationship of root biomass and SOC has not been clearly described in turfgrass. Hamido et al. [39] reported that the highest root biomass and root carbon were observed in zoysiagrass, followed by centipedegrass and hybrid bermuda, corresponding to their SOC sequestration. Using isotopes, Qian et al. [38] demonstrated that root biomass differences in hard fescue (*F. brevipila* Tracey) and sheep fescue (*F. ovina* L.) mixture, Kentucky bluegrass, and creeping bentgrass contributed significantly to SOC, although other factors could also affect the total SOC.

Whether cool-season (C3) and warm-season (C4) turfgrasses differ in carbon sequestration ability is still unclear. In a Mediterranean climate, common bermuda (C4) was shown to have higher photosynthetic capacity in the summer but was sensitive to mild or low temperatures; thus, there was no clear distinction between the carbon sequestration ability of C3 and C4 turfgrasses [50]. Another study indicated that common bermuda (C4) had lower SOC than tall fescue and Kentucky bluegrass (C3) in east Tennessee, likely because the higher temperature of the warm-season turfgrass growing season is also favorable for microbial decomposition of SOC [69]. A study of lawns with various turfgrass species in different climates suggested that higher SOC was associated with lower mean annual temperature [86]. Although temperature affects soil microbe activities and soil respiration, another possible factor is that cool-season grasses have a longer growing season compared to warm-season turfgrasses are grown in the regions where they are adapted. Modeling the NEE of turfgrass on a nationwide scale, Milesi et al. [5] also implied that growing season length could affect the NPP of turfgrass.

The NPP and carbon allocation in turfgrass biomass can affect the carbon inputs in the turfgrass–soil system. Similar to Acuña E. et al. [50], Law et al. [100] reported that newly established (<3 years) tall fescue accumulated more labile soil carbon, total soil carbon, and soil organic matter than Kentucky bluegrass. In contrast, Law and Patton [52] evaluated tall fescue and Kentucky bluegrass cultivars with varying growth rates and concluded that in the short term, growth did not affect soil carbon accumulation but that slow-growing cultivars can have higher net carbon accumulation with less mowing requirements and fuel emissions. Qian et al. [38] quantified the soil carbon sequestration and SOC decomposition in C3 cool-season turfgrasses and reported higher net carbon sequestration rates for irrigated fine fescue rough (0.74 Mg C $ha^{-1} yr^{-1}$) and creeping bentgrass fairway (0.78 Mg C $ha^{-1} yr^{-1}$) than for Kentucky bluegrass short rough (0.32 Mg C $ha^{-1} yr^{-1}$). Fine fescues were also shown to have great potential for soil carbon accumulation in the surface 20 cm profile relative to other C3 cool-season turfgrasses, which were ranked in the following order: red fescues (*F. rubra* spp.) > sheep fescue > creeping bentgrass, tall fescue, Kentucky bluegrass > perennial ryegrass [46]. Interestingly, such variation among turfgrass species and subspecies was related to thatch thickness [46]. In another study, carbon stored in the thatch layer varied from 0.05 to 0.1 Mg C· $ha^{-1} yr^{-1}$ in the order of zoysia-grass < hybrid bermuda < centipedegrass lawns [39]. Zoysiagrass, hybrid bermuda, and centipedegrass are warm-season grasses that propagate by stolons and/or rhizomes.

Fast-growing and dense turfgrasses, as well as rigorous lateral growth type turfgrass species, often favor thatch development. Stolons are aboveground stems, whereas rhizomes are underground stems, both allowing turfgrass to spread horizontally. More importantly, stolons and rhizomes are major storage regions for carbohydrate reserves [101]. Creeping bentgrass (stoloniferous) and zoysiagrass (rhizomatous and stoloniferous) thatch was reported to have high carbon contents of 77.7 and 73.4 g kg⁻¹, respectively, and the authors also suggested that thatch can be a temporary carbon sink [47]. The thatch biomass of Kentucky bluegrass, creeping bentgrass, and fine fescue (hard fescue and sheep fescue mixture) was greater than that of verdure or root biomass [38,42]. Additionally, Evers et al. [46] showed that carbon accumulation in the thatch/mat layers was higher than that in the 0–20 cm soil depth. Given that thatch has been shown to have high carbon content [48], whether turfgrass species with thatch-forming tendency have greater potential for carbon sequestration needs to be further investigated.

Research on the adaptation of turfgrass species on a nationwide or global scale is critically important but very limited. High CO_2 assimilation rates and long growing seasons can be equally important when choosing turfgrass species. Turfgrass species that are adapted to local climates, as well as those that are tolerant to environmental (cold, heat, drought, etc.) and biotic (diseases, insects, etc.) stresses are able to maintain turf color and cover to assimilate atmospheric CO_2 without going into dormancy under adverse conditions. The growth rate of turfgrass species is not a reliable indicator of carbon sequestration rate. Other factors, such as biomass production and allocation of carbon to shoots, roots, and thatch, also need to be considered. Enhancing carbon sequestration through grass species selection and adaptation is an important direction for future research.

6. Turf Use and Management Intensity

High management inputs often ensure healthy and dense turf, producing greater amounts of above- and belowground biomass, which increases primary productivity. Using models, a number of studies have predicted that increasing resource inputs (such as fertilization and irrigation) would increase carbon sequestration [5,10,42]. However, operations and maintenance contribute a significant portion of carbon emissions in the turfgrass carbon budget.

Home lawns vary considerably in terms of management practices and intensity. Despite the limited scale of research comparing two lawn sites, early research showed that more intensive management led to greater aboveground production but similar NPP [15]. Although changes in NPP were insignificant, Lilly et al. [43] demonstrated that maintenance practices had substantial effects on how carbon was allocated in the production of root, stubble, and clipping biomass. Additionally, Golubiewski [34] reported that high management increased the aboveground NPP and biomass. High maintenance ensures the density and quality of turfgrass, resulting in increased biomass. Using a modeling approach, Zirkle et al. [8] was able to analyze soil data on a large scale and concluded that low management with minimal input (mowing only) resulted in the lowest net SOC sequestration rate (accounting for HCC) of 0.254 to 1.142 Mg C ha⁻¹ yr⁻¹, whereas do-it-yourself management by homeowners and high management based on best management practices resulted in sequestration rates of 0.806 to 1.830 Mg C ha⁻¹ yr⁻¹ and 0.517 to 2.043 Mg C ha⁻¹ yr⁻¹, respectively. In another study, Gu et al. [10] showed that greater management intensity could contribute to higher SOC and higher net GHG emissions. Reducing management practice intensity could effectively reduce net GHGs and N₂O emissions; however, lawns without irrigation and fertilization were gradually depleting the SOC pool [10].

In other cases, management practices have very limited effects on soil carbon [16,75]. Intensively managed turfs, such as golf course greens, consume energy and emit CO_2 [76,80], whereas fairways and roughs require less input. Braun and Bremer [75] reported that a higher-input management (urea fertilization and medium irrigation regime) was shown to have higher HCCs and did not increase net carbon sequestration compared with a low management input (no N fertilization and low irrigation regime). High management intensity does not always guarantee carbon gains in turfgrass systems but contributes to significant HCCs; therefore, the effects of each management practice on carbon sequestration need to be evaluated.

7. Management Practices

Proper management practices are crucial for minimizing biotic and abiotic stresses in turfgrass. When turfgrass is under stress, respiration exceeds photosynthesis, resulting in CO_2 release into the atmosphere. Irrigation, fertilization, and mowing practices can positively or negatively affect the ability of turfgrass systems to assimilate and store carbon. Many studies have evaluated the individual effects of irrigation, fertilization, and mowing or a combination of these cultural management practices.

Mowing is considered the most energy-consuming practice in turfgrass management [82]. Irrigation and fertilization are primary cultural practices that can promote the production of shoot and root biomass, as well as NPP, but also increase soil respiration [5]. Another concern is that irrigation and fertilization could lead to the emission of GHGs. Gu et al. [10] raised concerns about N₂O emissions with irrigation and fertilization practices. Research by Livesley et al. [68] demonstrated that N₂O emissions increased sharply and peaked following a fertilizer application and rainfall event. Braun and Bremer [11] provided a review of N₂O research in turfgrass systems and reported a wide range of N₂O emission factors (0.17% to 5.1%) of applied N fertilizer with an average of 1.9%. There is a need for research-based information to utilize management practices that increase carbon gains and reduce carbon costs.

7.1. Irrigation

Research showed that low soil water content (<0.15 m³ m⁻³) can limit the ability of turfgrass to assimilate atmospheric CO₂ in response to high light intensity, whereas under adequate water soil conditions (>0.15 m³ m⁻³), the NEE of turfgrass increased as light intensity increased [88]. Under warm conditions, irrigation can also promote microbial activities, which consequently decompose soil organic matter. Therefore, irrigation was reported to increase both SOC input and decomposition [38].

Carbon balance affected by irrigation can vary considerably, depending on the climate and precipitation. The requirement for irrigation can be minimal in temperate regions where turfgrass is well adapted, whereas irrigation plays a vital role in arid and semiarid regions and can represent a major source of carbon consumption in turfgrass systems. The energy required for irrigation was estimated to be about 193 g CO₂ m⁻² yr⁻¹ (0.526 Mg C-e ha⁻¹ yr⁻¹), which is higher than the estimated CO₂ emissions from fuel consumption (122 g CO₂ m⁻² yr⁻¹ converted to 0.333 Mg C-e ha⁻¹ yr⁻¹) for maintenance because this study was conducted in Irvine, CA, a moderately dry climate where annual precipitation is approximately 350 mm yr⁻¹ [23]. In Phoenix, AZ, mesic landscaping with irrigated turfgrass was reported to be a carbon sink primarily controlled by plant photosynthetic activity, whereas other landscapes were unable to offset emissions from anthropogenic processes [36]. Research conducted in College Park, MD, a temperate climate with annual precipitation of 1065 mm yr⁻¹, indicated that irrigation did not affect NPP but increased root biomass compared to no irrigation [43]. Qian et al. [38] demonstrated that carbon sequestration rates on a golf course in Nebraska City, NE, were 0.74 and 0.52 Mg C ha⁻¹ yr⁻¹ for irrigated and unirrigated (twice a week at 70% ET) fine fescue mixture, respectively; however, this is not a direct comparison, as irrigated and unirrigated fine fescue mixtures were maintained at different mowing heights (5.1 and 7.6 cm, respectively). Irrigation was reported to increase both aboveground NPP and SOC; therefore, a modeling approach by Zhang et al. [102] predicted a 50% reduction in the annual net production when irrigation was decreased from 100% to 60% potential evapotranspiration in the Colorado Front Range, a semiarid region.

7.2. Nitrogen Fertilization

Nitrogen (N) is the most important nutrient for turfgrass establishment and growth [103]. In addition to promoting above- and belowground biomass, N also affects stress tolerance to temperature and pests [103]. Without N fertilization, turfgrass struggles to maintain its overall quality and vigor. In carbon research, N was shown to promote carbon sequestration compared to no N [51]. However, N applications only contributed to the SOC increase in the soil surface at the 0–2.5 cm depth [51]. Similarly, increasing fertilization frequency was correlated with higher soil carbon content at the 0–5 cm depth [27]. Nitrogen primarily promotes aboveground biomass; hence, deposits of old leaves increase SOC at shallow soil depths.

On the contrary, increasing N rates may not be beneficial and can sometimes negatively affect carbon sequestration in turfgrass systems. Measuring soil respiration rates with an opaque closed gas chamber suggested that CO_2 emissions significantly increased from 292 to 394 kg ha⁻¹ d⁻¹ as the N rate increased from 24 to 196 kg ha⁻¹ in 8-yr-old 'Tifway' hybrid bermuda plots, and fertilization in association with higher soil temperatures and moisture contents resulted in larger fluxes of CO_2 [58]. The authors speculated that N fertilization stimulated microbial and root activities, resulting in an increased CO_2 flux from the soil [58]. Similarly, Brandani et al. [104] reported generally higher soil CO_2 emissions as the N rate increased in tall fescue and hybrid bermuda research plots. While N is essential for newly established turfgrass, N rates can be reduced in mature turfgrass and still achieve similar carbon sequestration in the soil [42,72]. Reducing N fertilization also reduced N₂O emissions [10,23,57], whereas fertilization did not affect soil CH₄ exchange [68,104]. In summary, reducing fertilization can be an effective means of mitigating GHGs from turfgrass–soil systems [10,23].

Fertilization can affect carbon allocation in turfgrass systems, which also depends on the grass species. One study showed that fertilization did not influence the SOC concentration in a mixture of strong creeping red fescue and Kentucky bluegrass but increased the thickness of the thatch layer [105]. Likely because both species are aggressive rhizomatous type turfgrasses, carbohydrates are allocated in rhizomes for storage, resulting in thatch buildup rather than increasing SOC. Grass clippings decompose quickly, which can contribute to the SOC in the soil surface [106], whereas thatch is more resistant to decay than clippings or senescent leaves [48]. In tall fescue lawns, increasing N fertilization increased clippings production but did not affect the

NPP when clippings were returned [43]. An increase in clipping biomass could lead to a significant carbon loss from the turfgrass system if clippings are removed. Clipping management is further discussed below. A higher-input management regime of irrigation and N fertilization did not increase carbon sequestration compared with a low management input regime, suggesting the potential of utilizing minimal maintenance practices to save energy [75]. Collectively, research has shown that N fertilization in turfgrass systems has limited benefits for carbon sequestration and GHG mitigation, especially with mature stands.

7.3. Mowing

Mowing can affect the biomass production of turfgrass, as well as soil respiration, by altering soil moisture and temperature. Mowing practices have received a considerable amount of research attention. The effects of mowing height, mowing frequency, and clipping management on carbon balance in turfgrass systems have been evaluated. Few studies have shown that mowing has a significant impact on carbon balance in turf [12,107].

Turfgrass managed under higher mowing height has greater shoot biomass and therefore greater capacity for carbon fixation through photosynthesis [56]. In addition to an increased photosynthetic rate, Kentucky bluegrass mowed at 7.6 cm generally had a higher R_{eco} rate and canopy photosynthesis to R_{eco} ratio compared with Kentucky bluegrass mowed at 3.8 cm [56]. R_{eco} includes respiration from shoots, roots, and soil microorganisms. Although a higher mowing height has greater potential to assimilate CO_2 from the atmosphere, cool-season turfgrass can still act as a carbon emitter during warm months when the total respiration rate of shoots, roots, and soil exceeds canopy photosynthesis [56]. In another study, mowing height (5 or 10 cm) did not affect the NPP (sum of clippings, stubble, and root production) of tall fescue lawns [43].

Reducing mowing frequency reduces HCC from fuel consumption and can also affect respiration and aboveground NPP in turfgrass systems. Allaire et al. [107] reported that mowing frequency mostly influenced respiration (biogenic CO₂ emission) as compared to N fertilization, and a frequently mowed turfgrass system produced CO₂ emissions four times higher than an infrequently mowed turfgrass system. Interestingly, soil CO₂ fluxes were unaffected by mowing frequency in another study, and fuel emissions from mowing were minimal compared to those from soil respiration [61]. Frequent mowing increased aboveground NPP and SOC compared to meadow-like lawns that were mowed once per season in some sites but not all six sites [79]. The authors also found that root biomass was not affected by mowing, suggesting that mowing could increase SOC by promoting aboveground NPP, which is a significant carbon input to turfgrass systems if clippings are left on the lawn [79]. To reduce the gasoline emissions associated with mowing, choosing an appropriate type of mower needs to be considered. Recently, battery-, electricity-powered mowers and manual reel mowers with much lower energy consumption have become popular alternatives to gasoline mowers [108,109,110].

Both returning and removing clippings are common mowing practices in turfgrass management. Grass clipping management affects the recycling of C and N and is therefore a crucial part of the carbon balance in turfgrass systems. Research has shown that a substantial amount of carbon fixation in turfgrass is allocated in producing aboveground biomass; therefore, clipping management can be a critical driver of the carbon balance in turfgrass systems [28, 42, 52]. Returning clippings was demonstrated to reduce net GHGs by 12% [10]. Grass clippings are a source of N; therefore, returning clippings could have a similar effect as adding N fertilizer. Qian et al. [42] reported that returning clippings increased soil carbon sequestration, and such an effect was more pronounced under a low fertilization regime. Returning clippings contributed to substantial increases in turfgrass productivity and small increases (0.2%) in SOC [111]. Additionally, increases in carbon content and stock due to returning clippings only occurred in the top 5 cm [105] and top 15 cm [17] soil layer but not in the deeper soil profile. Turfgrass clippings decompose rapidly; research showed that 20% of clipping carbon decomposed within seven days [106]. Fresh plant residues, including grass clippings and roots, make up the labile soil carbon pool. Law et al. [100] reported that after two years, plots with grass clippings returned had a 3.3% increase in labile soil carbon (826 vs. 800 mg C kg⁻¹) and a 3.3% increase in total soil carbon $(24.7 \text{ vs. } 23.9 \text{ g C kg}^{-1})$ relative to those with clippings collected. Additionally, returning clippings can reduce the need for fertilization [42,112], which can decrease the HCCs associated with fertilizer production and transportation. In scenarios when turfgrass clippings were removed and composted on site or elsewhere, the carbon captured in the clippings should not be considered a complete loss (Figure 1) because compost may be added to other systems, such as vegetable gardens, or used to make compost fertilizers. In some rare scenarios, such as when clippings were burnt [28], the carbon captured in the clippings was released to the atmosphere as CO_2 .

7.4. Plant Growth Regulator

Limited research has been conducted on plant growth regulator (PGR) effects on carbon sequestration in turfgrass. López-Bellido et al. [51] found that the application of paclobutrazol and trinexapac-ethyl (both PGRs inhibit gibberellin biosynthesis) to creeping bentgrass fairway turf increased SOC. Because paclobutrazol promotes root growth, the authors [51] also determined that the SOC concentration was higher with paclobutrazol applications in comparison with no PGR for all soil depths between 0 and 15 cm. In contrast, N applications increased SOC concentration only near the soil surface (0–2.5 cm depth) in the same study [51]. Trinexapac-ethyl had a lesser effect in promoting carbon sequestration than paclobutrazol [51]. Although knowledge of the complete carbon footprint of turfgrass systems is still limited, many studies in the literature provide useful information with respect to how turfgrass contributes to net carbon sequestration or emissions by analyzing soil samples, photosynthesis, respiration, etc. Direct measurement of all inputs and outputs of a turfgrass–soil system is challenging and sometimes not feasible. Most urban research has been conducted in residential lawns by collecting soil samples and correlating results with homeowner surveys; such a method also assumes that a turfgrass system within the residential lot is the same age as the house. Quantifying SOC in turfgrass systems over time can be useful, but seasonal SOC variation needs to be considered when determining sampling time. Unlike managing other crop systems on a monthly basis, turfgrass management practices, such as mowing and irrigation, are conducted on a weekly or even daily basis. Many turfgrass carbon studies have revealed seasonal variations in SOC, CO_2 flux, and biomass measurements [29,40,43,50,58,113]; therefore, research needs to be conducted over a long period of time, i.e., one or more years.

Net ecosystem CO₂ exchange can be measured on a small scale with a sealed gas chamber or on a large scale with the eddy covariance method. Quantifying NEE with a sealed clear chamber has been limited in turfgrass research [113,114]. Although many studies have measured soil respiration with sealed gas chambers [29,31,35,40,55,56,58,59,61,64,66], among those studies, only one also measured the photosynthesis rate [56]. Additionally, research continuously measuring CO₂ fluxes in turfgrass systems is very limited. Livesley et al. [68] used automatic chambers to measure CH₄ and N₂O fluxes for three weeks. In a recent study, Velasco et al. [28] continuously monitored flux gradient using CO₂ sensors over a few years. The eddy covariance method was used on larger turfgrass areas, such as urban landscape [36] and sod farm [88], but has limitations to use on small turf areas [115]. Ng et al. [55] used both eddy covariance and flux chambers to quantify carbon balance in a tropical turfgrass system.

Models are useful for simulation of medium- to long-term (100 to <1000 years) changes, which are nearly impossible to monitor in field studies. Many models have been developed to predict GHG emissions in agriculture. A few studies have estimated carbon cycling in turfgrass systems by using model simulations, such as the CENTURY model [37,42,92,111], the DAYCENT model [102], the DNDC (DeNitrification–DeComposition) biogeochemical model [10], and other life cycle analysis models [8,76]. On a nationwide scale, Milesi et al. [5] used the Biome-BGC ecosystem process model to simulate carbon balance of turfgrasses in the USA.

Tracking soil carbon changes over a long period of time is not always feasible. To better understand the long-term dynamics of SOC, Bandaranayake et al. [92] applied the CENTURY model to turfgrass systems and estimated carbon sequestration in the 0–20 cm layer at the rate of 0.9 to

1.2 Mg C ha⁻¹ yr⁻¹ on golf course fairways for about 30 years and 0.6 Mg C ha⁻¹ yr⁻¹ on putting greens for 34 to 44 years. They also showed that the CENTURY model correlated well with historic soil-testing data generated by Qian and Follett [21]. The CENTURY model is a multicompartmental ecosystem model that was developed to evaluate carbon dynamics in the Great Plains grasslands [116]. The major input variables for the CENTURY model include soil texture, monthly air temperatures, precipitation, irrigation, lignin content of the plant, C and N contents of plant tissue and initial soil, and soil N inputs through fertilization and atmospheric deposition [116,117]. However, Trammell et al. [37] suggested no relationship between initial CENTURY model simulations and observed soil carbon and demonstrated that the CENTURY model could be improved by incorporating human disturbances and management practice factors. Qian et al. [42] showed that the CENTURY model was able to estimate annual clipping yield of Kentucky bluegrass. Similar to the CENTURY model, the DAYCENT model uses a daily time scale and includes soil water and temperature dynamics [118]. The DAYCENT model has been successfully adopted in turfgrass research to investigate long-term irrigation and fertilization effects [102] and to estimate N₂O emissions [72]. Limited research using DAYCENT and DNDC models suggests that there is a need to further develop, improve, and validate these models specifically for turfgrass systems.

Although biochemical simulation models (such as CENTURY, DAYCENT, and DNDC) are commonly used in agriculture systems, their use in turfgrass systems is scarce. Future research is needed to more accurately estimate the whole-system carbon exchange using simulation models. Most studies in turfgrass evaluate some form of soil carbon; however, research on CO_2 fluxes and the total carbon budget in turfgrass systems is limited. Chronosequence studies evaluate the effects of age by collecting soil samples from turfgrass sites varying in age, although this method cannot exclude the initial soil properties (including SOC). The biometric approach estimates NEE by measuring the NPP of annual shoot and root growth and subtracts R_{eco} ; however, this method is very labor-intensive. Alternatively, many years of measurements are needed to assess SOC changes as influenced by management practices because carbon change in soil is a slow process. Therefore, studies monitoring long-term SOC dynamics are also needed.

9. Best Management Practices for Carbon Sequestration

The goal of enhancing carbon sequestration in turfgrass systems can be achieved by increasing carbon fixation and decreasing CO_2 emissions. The major emissions from turfgrass systems comprise of HCCs from operations and maintenance. Additionally, turfgrass can emit CO_2 into the atmosphere under stress conditions when respiration exceeds photosynthesis. Therefore, proper management practices are crucial to keep HCCs low but also maintain healthy turf.

Irrigation, fertilization, and mowing are primary practices that can be optimized to promote carbon sequestration. Irrigation regimes need to be developed based on the local climate to irrigate only when rainfall is insufficient to maintain healthy turf. Irrigation increases both SOC additions and decomposition. Evapotranspiration (ET)-based irrigation can be useful to avoid overwatering but still maintain turf quality for high NPP and SOC accumulation; additional research is needed to determine the range of ET replacement for different turfgrass species to enhance carbon sequestration. Nitrogen fertilization needs to be reduced as the age of the turfgrass stand increases [10,102]. One major concern associated with N fertilization is N_2O emissions, which have a higher GWP than CO₂. Both overwatering and fertilization can result in N₂O emissions, which offset the carbon sequestration potential of turfgrass systems. Therefore, fertilization efficiency should not be neglected by turf managers and homeowners to avoid intensifying the greenhouse effect. Reduced irrigation and controlled-release forms of N fertilizers are recommended to reduce N_2O emissions in turfgrass [11]. When irrigation and fertilization inputs are low, reduced mowing needs should be expected, which saves fuel without sacrificing turfgrass quality and health. On the other hand, when turfgrass is actively growing, avoiding mowing is not an appropriate management practice. Alternatively, more energy efficient mowers (batteryand electricity-powered mowers, as well as manual reel mowers) can be used in some turfgrass systems to reduce the HCC of fuel emissions. Higher mowing height within the optimal mowing height range determined according to turfgrass species, as well as returning clippings, can also contribute to enhancing carbon sequestration. Golf courses, as a whole, have the potential to act as carbon sinks; the focus should be to reduce the HCCs of turfgrass maintenance practices from diesel and gasoline.

Another critical source of carbon losses from the turfgrass system is ecosystem respiration. Research shows that the combination of high soil moisture and temperature can boost soil microbial activities to decompose SOC, which are reflected as high ecosystem respiration [28,29,40,58]. Other organic management practices incorporating carbon into turfgrass soils, such as adding biochar and compost, need to be explored. Adding compost to lawns can increase SOC, but at the same time it also increases soil respiration [119,120]. Research evaluating the effects of management practices on minimizing ecosystem respiration is lacking.

Finally, selecting appropriate turfgrass species that are well adapted to the local climate can save significant maintenance carbon costs associated with irrigation, fertilization, mowing, and pesticides. Planting turfgrass varieties that are adapted to local conditions, as well as those tolerant to environmental (cold, heat, drought, etc.) and biotic (diseases, insects, etc.) stresses can ensure healthy turf with a longer growing season and a shorter period of dormancy, resulting in increased capacity to assimilate CO_2 . Although extensively managed turfgrasses for sports fields and putting greens may not be reliable carbon sinks, other moderately or minimally managed turf areas are potential sinks of atmospheric CO_2 . Future research needs to focus on reducing HCCs associated with turfgrass management, as well as other GHGs, such as N₂O.

Acknowledgments

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Funding Statement

This work was supported by the U.S. Department of Agriculture's (USDA) Agricultural Marketing Service through grant ODA6026GR to A.R.K. and the USDA Agricultural Research Service through project <u>2090-11000-008</u> to C.L.P. This review and its contents are solely the responsibility of the authors and do not necessarily represent the official views of the USDA.

Author Contributions

Conceptualization, R.W. and A.R.K.; writing—original draft preparation, R.W., C.M.M. and C.L.P.; writing—review and editing, R.W., C.M.M., C.L.P. and A.R.K.; funding acquisition, C.L.P. and A.R.K. All authors have read and agreed to the published version of the manuscript.

Data Availability Statement

Not applicable.

Conflicts of Interest

The authors declare no conflict of interest.

Footnotes

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Here is the comment you selected to display.

Comment 19 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Steffani
	Last Name	Fisher
	Email Address	steffanifisher@gmail.com
	Affiliation	
	Subject	Gas Prices
019.1	Comment	Our gas prices and taxes are the highest in the nation. You need to make do with the budget you have and not raise our gas prices anymore.

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 06:35:20

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 20 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Katherine
Last Name	Ursini
Email Address	Kathyursini@gmail.com
Affiliation	
Subject	Gas prices
¹ Comment	If you think this is such a great idea, why are you waiting until three days after the election to impose it?

Attachment

020.

Original File Name

Date and Time Comment Was Submitted 2024-10-11 06:48:32

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 21 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Ryan
Last Name	Gaytan
Email Address	Ryangaytan@gmail.com
Affiliation	None
Subject	Gas Taxes and Prices

021.1 Comment

Good morning. Gas prices in California are already the highest in the nation, primarily driven by our state taxes and mandated refining standards that are different from other states.

At the same time, California's housing and food costs have skyrocketed out of control and more people are struggling to get by than ever.

Any change to regulations that would increase gas prices further would disproportionately affect low and middle income people. Please vote against any changes to regulations that would increase gas prices - and I'd strongly encourage you to roll back whatever regulations you can to help bring our gas prices more in line with the rest of the country.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 06:48:51

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 22 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Christine
	Last Name	Lutz
	Email Address	chrismiss8@aol.com
	Affiliation	
	Subject	Stop Raising our Gas Prices!!!
022.1	Comment	This is insane, stop raising our gas prices! We do not support (this!!!

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 06:55:55

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 23 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Lauren
	Last Name	Beck
	Email Address	laurenandbryan2010@yahoo.com
	Affiliation	
	Subject	Stop raising our gas prices!
023.1	Comment	You are price gouging the people you are supposed to represent. If this was on the ballot, there is no way it would pass. You are unilaterally causing the highest gas in the country with your broad restrictions. If you need money for the deficit you created, find another way other than by taxation without representation.

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 06:58:14

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 24 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Claire
	Last Name	Curci
	Email Address	ramserclaire@gmail.com
	Affiliation	
	Subject	Oppose new gas tax
024.1	Comment	We have seen too many gas tax increases over the last few years please do not pass another one. We are all struggling and tax payers wouldn't approve this if voted on

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 07:00:20

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 25 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Carson
Last Name	Hill
Email Address	carsonphill@gmail.com
Affiliation	
Subject	Higher Gas Prices

025.1

Comment

Why is it that we use more energy than any other state to make our gas that some say doesn't burn any cleaner? At what cost of emissions energy to make our fuels does it make sense? How much emissions are put off compared to other states per gallon in CA? What is the reason for the tax hike? What is it going to fix or how is it going to stop climate change? Do you realize this only hurts the lower income communities more by raising gas prices? The single mother that is trying to make ends meet that has to drive her kids to school then 20 miles both ways every day for work. This doesn't help our already struggling economy in CA. This will make everything worse by making everything more expensive and more difficult for the lower income families and communities.

Throwing money at something doesn't always work!

What is the reason for the CARB sticker on the boats? What do they mean and what do they actually accomplish for CARB?

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 06:48:16

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

026.1

Comment Log Display

Here is the comment you selected to display.

Comment 26 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Angelique
Last Name	Francis
Email Address	angelfrancis23@yahoo.com
Affiliation	
Subject	No on new .65 gas tax!
Comment	No on new .65 gas tax!
Attachment	
Original File Name	
Date and Time Comment Was Submitted	2024-10-11 07:15:15

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 27 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	James
	Last Name	Leimkuhler
	Email Address	jim.leimkuhler@gmail.com
	Affiliation	
	Subject	CARB Policy on Fuel
027.1	Comment	What are you even thinking? Putting more regulations on companies that make gasoline including diesel fuel is totally wrong. We need less regulation and government intervention in what private companies do. Let consumers (the people) vote with their feet or their wallet vs more onerous policies set by your board. California gas prices are so I reasonably high due to your policies how can you even think of adding to the burden? Just stop please.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 07:15:09

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 28 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Mollie
	Last Name	Butcher
	Email Address	Molliebrady@roadrunner.com
	Affiliation	
	Subject	Low carbon fuel standard amendments
028.1	Comment	California can not afford 1 cent of an increase in taxes on fuel. Get back to reality and stop gaslighting the citizens of our state! You can't keep taxing hard working citizens to solve our horrendous actions of Newsom! It's unacceptable and unconstitutional to keep raising CA taxes! You all aren't elected by "we the people"! It's outrageous and you should all be ashamed at the harm you are doing to people who can't even afford to feed their families all over California!

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 07:15:16

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 29 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Jordan
Last Name	Francis
Email Address	jordan.francis1987@gmail.com
Affiliation	
Subject	Don't do it
Comment	Please do not increase any standards or costs on our refineries. You would only be worsening the quality of life for everyone stuck living in California.

Attachment

029.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 07:24:36

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 30 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Ann
	Last Name	Ramser
	Email Address	Annramser@hotmail.com
	Affiliation	
	Subject	Gas tax
030.1	Comment	Enough is enough! I object to the proposed upcoming gas tax. Californians pay more than their fair share. Gas in our state in insanely expensive. Our state representatives need to find another way to fund their bloated spending.

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 07:22:40

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 31 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Daniel
Last Name	McGirr
Email Address	danieljeremiah1121@gmail.c
Affiliation	
Subject	Gas
Comment	Don't you dare raise prices on gas again. Enough is enough

Attachment

031.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 07:29:05

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 32 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Lisa
Last Name	Johnson
Email Address	ljohnson@coastalshred.com
Affiliation	Taxpayer
Subject	Gas prices
Comment	One bad decision does not deserve more and more! California is in a definite downward spiral! You have lost a majority of the tax paying workers by your cumulative bad decisions and raising gas prices is not the answer !

Attachment

032.1

Original File Name
Date and Time Comment Was Submitted 2024-10-11 07:23:44

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 33 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Suzanne
Last Name	Coulston
Email Address	suzannecms@yahoo.com
Affiliation	
Subject	Stop Raising Gas Prices

^{033.1} Comment

Those of us that live in south Orange County that aren't the Uber
wealthy are struggling to fill our tanks to get to work. Much less
afford to buy an electric car. My electric bill is already
outrageous. I have 1 kid in college and 2 more right behind her. I
make just a little too much for financial aid but not enough to not
live paycheck to paycheck. Please don't raise the gas prices. This
hurts middle and lower class more than anything else. If we can't
get to work, we can't thrive.
We've already cut cable and every other non essential. Getting to
work is an essential.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 07:31:31

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 34 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Tamala
Last Name	Waken
Email Address	Jtwaken@hotmail.com
Affiliation	
Subject	CARB regulations
^{4.1} Comment	I am against the proposed low carbon fuel standard amendments. These amendments will raise the price of fuel. We in California are under a huge financial burden because of high gas prices. It's difficult to care for our family's needs when so much of our budget goes to pay for gas.

Attachment

03

Original File Name

Date and Time Comment Was Submitted 2024-10-11 07:32:29

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 35 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Sherry
Last Name	Kendzejeski
Email Address	gueshuu@yahoo.com
Affiliation	
Subject	Carb
Comment	Would like more information as this sounds ludicrous.

035.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 07:42:24

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 36 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Lorin
	Last Name	McDaniel
	Email Address	Loriliz29@aol.com
	Affiliation	
	Subject	Proposed low carbon fuel
036.1	Comment	I am very much against this bill. This is not only an incredibly high increase in cost to those of us who live here but it continues to show that the leaders of this state put the needs of the people last. It is ego and power over care for those of us who live here. We are the 2nd most expensive state to live in. Stop trying to fill your wallets and care for the people and do Not pass this.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 07:36:40

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 37 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Cardon
Last Name	Smith
Email Address	Cardonsmith@gmail.com
Affiliation	
Subject	No additional gas taxes
Comment	Our state's additional gas taxes are already crippling. It's adding to the unaffordability problem we are all facing and is an undue burden.

Attachment

037.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 07:44:15

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 38 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Lynn
	Last Name	Bender
	Email Address	lynn@bendersonline.com
	Affiliation	
	Subject	No more gas taxes
038.1	Comment	How can you consider any more regulations that will increase gas prices in this state when we are already paying significantly more than just about everyone else in the country? When is enough enough? Where does the greed stop and when will concern for the people being impacted by these prices begin? Please stop.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 07:47:39

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 39 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Joseph
Last Name	Byrd
Email Address	Josephbyrd09@gmail.com
Affiliation	
Subject	Gas price increase
Comment	To whom this may concern, I am against an increase in the gas tax/fees in California. Thank you, Joseph Byrd

Attachment

039.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 07:35:41

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 40 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Carrie
Last Name	Lee
Email Address	carrie.h.lee@gmail.com
Affiliation	
Subject	NO MORE TAXES!
Comment	Please stop raising our gas taxes. We are spread so thin in the state of California and you continue to just raise taxes. This impacts people of all works of life. Your madness needs to end.

Attachment

040.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 08:00:55

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 41 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Niki
Last Name	Good
Email Address	ngood7@gmail.com
Affiliation	
Subject	CARB gas increase proposal
Comment	As a citizen of California I am registering myself a protester to the proposed gas increases. I do not agree with the basis for the increases or with the proposed increases to be passed along to us in the form of increased taxes on gas.

Attachment

041.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 08:01:10

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

042.

Comment Log Display

Here is the comment you selected to display.

Comment 42 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Edris
	Last Name	Chambers
	Email Address	thechambersbunch@sbcglobal.net
	Affiliation	
	Subject	Please don't raise gas prices
1	Comment	Please don't pass the Low carbon gas tax
		Gas prices are already too high - let the refineries make gas. This
		nonsense of the highest prices in the nation is killing the
		California economy- not all of us want to rely on electric vehicles
		that are overpriced and undepenable - our power grid barely
		survives a normal summer and not all of us have the time to get to
		charging stations that are few and far between. This is nonsense
		and it needs to stop.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 08:04:43

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 43 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Mark
	Last Name	Foster
	Email Address	gulfhawk@aol.com
	Affiliation	
	Subject	Gasoline taxes
043.1	Comment	I'm against any increases or additions to the current gasoline taxes. I believe California has a spending problem, not a revenue problem. I'm also opposed to any new taxes based on miles driven. We are already paying exorbitant amounts for vehicle registrations.

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 08:06:31

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 44 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Diane
	Last Name	Hurst
	Email Address	Diane.hurst@mac.com
	Affiliation	
044.1	Subject	Gas tax
	Comment	We need LOWER gas prices in California. To pay for their gas, workers and business owners raise prices for everything, everyone is hurt both ways! Please focus on individuals and families and do not tax gas any more!

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 08:02:12

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 45 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Elizabeth
Last Name	Applebaum
Email Address	betsy.apple@verizon.net
Affiliation	
Subject	Gas Prices CARB Regulations
Comment	Do NOT add regulations that raise gas prices more! We are watching and aware!

Attachment

045.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 08:14:53

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 46 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Kerry
	Last Name	McCarthy
	Email Address	kerrykmk@gmail.com
	Affiliation	Resident of CA
	Subject	Increase of Gas Tax
1	Comment	This tax increase on top of all the other taxes we pay on gas is going to create a financial strain on my family. I think it is irresponsible and unnecessary. Please do a better job of managing our taxes. We already have the highest gas taxes in the nation.

Attachment

046.

Original File Name

Date and Time Comment Was Submitted 2024-10-11 08:16:11

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 47 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Chad
	Last Name	Rutan
	Email Address	azchadley@gmail.com
	Affiliation	
	Subject	CARB fuel increase
047.1	Comment	we are tired of how much money we have to pay for fuel. It's ridiculous. Stop taking our money.

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 08:25:04

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 48 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Rocco
	Last Name	Muratore
	Email Address	rjjmuratore@gmail.com
	Affiliation	
	Subject	Stop taxing gas!!
048.1	Comment	Enough already. Cut back on what you give to people that are here illegally

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 08:32:29

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 49 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Laura
Last Name	Morris
Email Address	morris.lauram@gmail.com
Affiliation	None
Subject	Unnecessary Gas Price Hike

049.1 Comment

The California working class is struggling. It is so hard to live in this state, especially for those who have a family to support. California has the highest gas prices in the nation. I have not checked recently, but I imagine it's over three dollars more expensive a gallon than in some states. Why would anyone want to unnecessarily increase gas prices again with another nonsense fee or tax? You are crippling people. It won't be the rich you hurt as they can afford it. It's going to be low income people who typically drive farther or use their vehicles for work. In this economy people are struggling to may rent and put food on the table. Have you not thought about how increasing gas prices is going to detrimentally impact the majority of people in the state?

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 08:25:48

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 50 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Lauren
Last Name	Kramer
Email Address	Lbauer24@hotmail.com
Affiliation	California resident for 45 years
Subject	Gas Prices
050.1 **Comment**

Please do not increase the fees or taxes that would raise gas prices once again. Everyone has already been squeezed hard enough by inflation and California already has the highest gas prices in the continental US. Stop doing this to us. We are tired. We work so hard and California keeps taking more and more. Please do not take this action in November. Please.

Sincerely,

Lauren Kramer

(Born in Long Beach, raised in Santa Ana, lifelong Californian)

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 08:36:11

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 51 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Elise
	Last Name	Connor
	Email Address	econnor333@gmail.com
	Affiliation	
	Subject	Carb gas increase
051.1	Comment	California legislators need to stop additional gas tax increases by CARB. Stop gaslighting citizens to believe the high prices are caused by oil companies. Hi gas prices in California are caused from Illegitimate taxes , fees and levies placed upon citizens by our legislators. No more increases in gas prices.

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 08:40:22

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 52 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Krizia
	Last Name	Liquido
	Email Address	Krizias@gmail.com
	Affiliation	
	Subject	NO on the Gas Tax
052.1	Comment	I'm a resident of Costa Mesa, CA and I vote NO on regulations to raise the gas tax by 65 cents. Please vote NO on me and my family's behalf. We are a family of 7 struggling to pay for BASIC NECESSITIES. We DO NOT have extra funds to subsidize these regulations!

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 08:47:58

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 53 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Rebecca
	Last Name	McGuff
	Email Address	Beckymcguff@gmail.com
	Affiliation	
	Subject	No Additional Gas Tax
053.1	Comment	I'm a resident of Costa Mesa, CA and I vote NO on future regulations to raise the gas tax by 65 cents. Please vote NO on behalf of me and my family. We are a family of 4 struggling to pay for BASIC NECESSITIES like our home, food, utilities, and our children's education. We DO NOT have extra funds to subsidize these regulations!

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 08:55:32

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 54 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Catharine
Last Name	Giles
Email Address	Cathgiles@yahoo.com
Affiliation	
Subject	CARB proposed price increase / low carbon fuel

054.1 Comment

Hello All,

California has the most expensive gas already with nearly \$1.50 of every gallon going to CA taxes. This increase of another possible \$0.68 makes the cost of gas prohibitive, especially to people who commute or are low income. Pair this with Newsom's ill conceived attempt to force storage levels on refineries and you have a power keg situation. The refineries will pass on the storage costs to consumers. So what, we'll have the cost of gas tax in CA nearing \$3 of every gallon? The level of bureaucratic absurdity in this policy is endemic of unelected officials making policies they don't understand, with wide ranging negative economic impact on all residents. These policies increase the cost of living, which will fuel the continued exodus of people moving out of state. It's time to stop making the cost of living in CA unreasonable.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 08:48:10

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 55 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Christa
	Last Name	Cole
	Email Address	ac90210@aol.com
	Affiliation	
	Subject	No additional tax on gas
055.1	Comment	California gas taxes are already too high. I mostly drive to take my son to school. He would go to school near our home where he can ride his bike but he was not allowed to enroll due to California law (he cannot have vaccination for medical reasons but could not get a medical exemption). So if California puts an additional tax on gas, I am now paying even more for my child's education. I am a 4th generation California native. California needs to slow down its taxes or my family will be forced to leave.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 09:05:23

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 56 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Andrew
Last Name	Belden
Email Address	andrewtbelden@gmail.com
Affiliation	
Subject	Concerns Regarding Proposed Gas Price Increase

056.1 Comment

Dear California Air Resources Board,

I am writing to express my concerns about the recent proposal that could potentially increase gasoline prices by as much as \$0.65 per gallon. While I fully support California's commitment to reducing emissions and promoting environmental sustainability, I believe this particular measure may have significant adverse effects on individuals, families, and businesses across the state.

Raising gas prices by such a substantial amount would place an additional financial burden on California residents, especially those in lower-income communities who rely heavily on personal vehicles for commuting and essential errands. The proposal could also have a ripple effect on the economy by increasing transportation costs for businesses, which may then pass these costs on to consumers.

Additionally, this price increase could disproportionately affect rural communities where public transportation options are limited, making it even more challenging for residents to afford necessary travel. It is crucial to consider policies that do not inadvertently impact vulnerable populations or create significant financial strain.

Instead of raising gas prices, I urge CARB to explore alternative approaches that continue to advance our environmental goals without compromising affordability and accessibility for all Californians. Initiatives like investing in public transportation infrastructure and promoting carpooling programs that can also help reduce emissions effectively. 056.1 Cont.

Thank you for your time and consideration. I hope that CARB will take into account the potential economic and social impacts of this proposal on California's residents. California residents are already overly burdened with the highest taxes in the state. This will only exacerbate the California exodus.

Sincerely,

Andrew Belden

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 09:04:39

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 57 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Michele
Last Name	Wilbert
Email Address	michelewilbert1@gmail.com
Affiliation	
Subject	Gas Price Increase

057.1 Comment

The decisions and choices the state of CA are making do not reflect
the people they represent. Consider the avg salary & then calculate
what the cost is for that family to fill their tank each week.
We need better fiscal responsibility in all areas so that gas
prices aren't used to make up for deficits.
I live in the Central Valley and pay the most for gas in an area
that produces gas. How does that make sense?
Make your decision based on what is best for the people you serve.
Thank you

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 09:33:16

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 58 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Annette
	Last Name	Harper
	Email Address	amharper1@cox.net
	Affiliation	
	Subject	Gas prices
058.1	Comment	It is absolutely unacceptable to consider an additional increase in gas prices or gas tax in CA! You are LITERALLY driving people out of the state! I will not and do not support this!!!

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 09:40:05

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

059.1

Comment Log Display

Here is the comment you selected to display.

Comment 59 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Alison
Last Name	Andrizzi
Email Address	andrizzifamily@msn.com
Affiliation	
Subject	Proposed gas tax increase
Comment	Is California trying to run everyone out of the state by acting like the government agencies know better than its citizens? I cannot believe this act is even possible three days after an election! Please stop trying to make life harder. I disagree with your policies and hope our state government will listen to the people and allow a vote!

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 09:39:20

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 60 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Anita
	Last Name	Munson
	Email Address	anitamunson10@gmail.com
	Affiliation	
	Subject	OPPOSE proposed gas tax
060.1	Comment	Hello, I am writing to voice my OPPOSITION to the proposed 65¢ gas tax. Thank you, Anita Munson

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 09:49:59

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 61 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Eric
	Last Name	Sentianin
	Email Address	Ericsentianin@yahoo.com
	Affiliation	
	Subject	Additional Gas Tax
061.1	Comment	No need for higher tax on gas. This state is consistently pushing taxes higher for the wrong reasons. It is destroying the middle and lower class income families. The state needs oversight and accountability about where the funds go. The streets are in shambles, the freeways have garbage and weeds growing all over them. It's obvious that the money is not being spent on fixing or taking care of our roadways.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 09:54:02

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 62 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Ryan
Last Name	Burgess
Email Address	Rcburgess83@gmail.com
Affiliation	
Subject	Carb Hike
Comment	Please you cannot raise gas again. This is getting pretty hard to comprehend how you can not care about the people in your state and how they can or cannot get by. There is a reason people are leaving California. I do not think this is fair. Please do NT proceed.

Attachment

062.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 09:58:09

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 63 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Chase
Last Name	Rief
Email Address	chase.rief@gmail.com
Affiliation	
Subject	Opposition to Further Gas Price Increases through LCFS Amendments

063.1 Comment

Dear CARB Commissioners,

I urge you to reconsider the proposed amendments to the Low Carbon Fuel Standard (LCFS), as they could raise gasoline prices further in an already challenging economic environment. California gas prices are the highest in the nation, and consumers are struggling with high inflation, reduced purchasing power, and wages that haven't kept pace over the past decade.

Now is not the time to burden Californians with additional costs at the pump. I encourage a balanced approach that considers consumer impact alongside environmental goals.

Thank you for considering public input on this matter.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 10:10:16

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

064.1

Comment Log Display

Here is the comment you selected to display.

Comment 64 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Tara
Last Name	Warner
Email Address	mrstarawarner@gmail.com
Affiliation	
Subject	No yo higher Gas prices
Comment	I'm a mom of 6. I'm already paying too much for gas. Other states do not have to pay this. In our home if we are over budget, we don't tax our kids. We cut the budget. That is just a normal, adult responsibility. If our state is out of money, please just change and limit how your spending money. Make the necessary sacrifices so we don't have to pay for your lack of management.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 09:56:55

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 65 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Joelle
Last Name	Palombo
Email Address	emprisesky@gmail.com
Affiliation	
Subject	No More Gas Taxes in CA

065.1 Comment

Dear Sirs,
I defiantly oppose any further regulations put on companies such as
Chevron in the state of CA. You have already pushed away every
other company and Chevron is the only company left that will work
with the state. These additional regulatory requirements you are
adding will add .65-\$2.00 a gallon more in gas prices for the
consumer and we cannot sustain another increase or tax!! We are all
living paycheck to paycheck with multiple jobs, raising our kids
and now this.
Please take Chevron seriously because they will walk IF you decide
to add further restrictions and WE THE PEOPLE cannot afford it. Put
aside the green new deal ideologies and start caring about the well
being of your citizens in CA.

We are tax paying and law abiding citizens that do not want this!!

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 10:23:08

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 66 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Tara
Last Name	Loew
Email Address	taralking@gmail.com
Affiliation	
Subject	We are all going broke!!
Comment	We cannot afford any more hikes in gas prices in CA!! Quit working against the working class and make policies to protect working Americans! This is insanityit's like kicking us while we are down. STOP

Attachment

066.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 10:32:47

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.
Here is the comment you selected to display.

Comment 67 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Jodi
Last Name	Harist
Email Address	Mycaliforniaeditor@gmail.com
Affiliation	
Subject	.65 cent increase
Comment	STOP the California insanity! Do not burden the citizens more.

Attachment

067.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 10:40:34

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 68 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	TRACY
	Last Name	CAZARES
	Email Address	traveltj@surfside.net
	Affiliation	
	Subject	Fuel Price Gouging
068.1	Comment	Our fuel prices are higher than Hawaii. How is that possible? We have the highest fuel prices in the country. California is the absolute worst place to live. I would move out if I could. I will NEVER drive an EV. So suck it carb.

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 10:51:44

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

069.1

Comment Log Display

Here is the comment you selected to display.

Comment 69 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Karen
Last Name	Escobar
Email Address	ocsportynurse@aol.com
Affiliation	
Subject	Gas pricing
Comment	Do not raise gas prices. We are already the highest in the Nation. Where is the audit for where all previous taxes collected on gas have gone to and or spent? Do not say our roads because they are still horrendous. You have no accountability for the decisions made. You should already have a list of where monies have been allocated to so no need to "pay" more for an audit.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 11:24:02

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 70 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Brigide
	Last Name	Daily
	Email Address	Bldailydc@gmail.com
	Affiliation	
	Subject	Gas tax
070.1	Comment	Please do not add taxes or fees to our gas prices. It is difficult to make ends meet and these fees are exorbitant.

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 11:19:09

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 71 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Linsey
Last Name	Carbone
Email Address	linseys@yahoo.com
Affiliation	
Subject	No gas price hikes!
Comment	Please please please I'm a mother of young children and we absolutely cannot take another hike in gas prices right now.

Attachment

071.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 11:35:26

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 72 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Brian
	Last Name	Schuler
	Email Address	bk_schulz@yahoo.com
	Affiliation	
	Subject	Gas tax increase
.1	Comment	In no way am I for this tax instead I propose massive cuts to government agencies (not public safety agencies). Stop with the ludicrous climate regulations and overbearing wasteful spending for ILLEGAL aliens. Get control of existing budget addition by subtraction formula.

Attachment

072

Original File Name

Date and Time Comment Was Submitted

2024-10-11 11:38:05

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 73 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Michael
	Last Name	Masai
	Email Address	mmasai9765@aol.com
	Affiliation	
	Subject	Gas Price Increase
073.1	Comment	Come on! You got to think about what 65 cents would do to the economy in Ca. Are you people idiots or just dumb or a little of both. People who have drive to work in traffic or long distances can't afford the gas prices now because of your already in place statues. What about the truck drivers who transport all the goods? College education or degrees just breed stupidity and no common sense.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 12:06:14

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 74 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Eileen
	Last Name	Saul
	Email Address	eileensaul@cox.net
	Affiliation	
	Subject	Low carbon fuel amendments!
074.1	Comment	I urge you not to oppress the citizens of California with another Insane and Unnecessary tax on our gasoline usage! We do not need another .65/ gallon raise in the cost of gas in this State. We are already paying the highest gas prices in the nation. Stop the insanity!!

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 12:26:11

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 75 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Travis
Last Name	Duffield
Email Address	Travis@duffyboats.com
Affiliation	
Subject	Low Carbon Fuel Standard

075.1 Comment

I would like to know what the purpose of this regulation is and how
me paying even more for fuel is somehow going to save the planet.
Your climate agenda is crushing the middle/lower class (who fund
your organization I might add). We already pay the highest prices
in the country, and you want more regulation that will further
increase those costs? Please help me understand the benefit of
these proposed regulations. I have seen no good come from anything
that CARB has done. What you have done successfully is forced
hardworking Californians out of business and out of state.
Congratulations!

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 12:05:35

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 76 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Gina
	Last Name	Gleason
	Email Address	ginagleason@mac.com
	Affiliation	
	Subject	Opposed to Fuel Price Increase!!
076.1	Comment	I am opposed to the \$0.65 addition to gas prices in CA. Please stop the madness and DO NOT PASS THIS!!

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 12:44:21

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 77 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Landon
Last Name	Brewer
Email Address	Landonbrewer@gmail.com
Affiliation	
Subject	Do NOT increase our gas taxes.
Comment	We already pay an absurd amount of gas tax. You cause more local inflation and damage to family savings than any other unelected or elected agency. Please stop for the love of God.

Attachment

077.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 12:54:23

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 78 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Katherine
	Last Name	Asher
	Email Address	Katherineasher1@gmail.com
	Affiliation	
	Subject	Prop to raise gas prices
078.1	Comment	California already has some of the highest prices of gas per gallon in the nation. A hike of \$0.65 a gallon is incredibly ludicrous and unnaccwptable. Especially when proposed by a board that is unelected. Do not proceed with this increase. Haven't we already seen enough young families, businesses and wealth leave our beautiful state?!

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 13:00:29

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 79 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Lauren
	Last Name	Bennett
079.1	Email Address	Lauren.geeves@gmail.com
	Affiliation	
	Subject	No on gas tax
	Comment	Being a huge state in our county we can no longer hold our citizens
		victims to gas taxes. We can't assume everyone can buy new EV cars
		and punish them for not following the mandate. People are leaving
		our state bc you hand made it unsafe and unaffordable. We have
		refineries for a reason . Let's us them and stop punishing the
		citizens with unnecessary taxes that are even helping out anyone or
		anything substantial.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 13:18:59

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 80 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Monique
	Last Name	Dixon
	Email Address	Moniquedixon14@gmail.com
	Affiliation	
	Subject	Gas prices
080.1	Comment	Please don't raise gas prices anymore, I can't afford it.

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 14:07:29

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 81 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Shari
Last Name	Sell
Email Address	sharilsell@gmail.com
Affiliation	
Subject	.65 cent/gallon tax increase

081.1 Comment

To whom it may concern,

CARB is the primary state agency responsible for actions to protect public health from the harmful effects of air pollution and to address global climate change. This increased gas tax you plan to add three days after the 2024 election has nothing to do with the idiots in Sacramento who didn't think about this whole electric car reality all the way through and how it would impact future non-gasoline tax government revenue. So now that gas revenue isn't as high as it used to be, you are now "losing" revenue, so let's gouge those who still use the pumps. If you keep adding this and that tax, I wouldn't be surprised if the refineries will eventually refuse to do business with the state of California. Please do better! Think of the ramifications of this additional tax and how it will affect a lot of Californians.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 13:38:05

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 82 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Carrie
Last Name	Prentice
Email Address	carriekprentice@gmail.com
Affiliation	
Subject	No to increasing gas prices

082.1 Comment

We are respectfully requesting you do not raise gas prices in CA. We are a family of four, including a newborn. We have good careers, but despite that, we continue to live paycheck to paycheck barely having enough money to pay for all necessities to live here. Please help the residents in California by not increasing gas prices. If not, you will continue to lose more and more people who will flee the state. Please stand up for the people who live here.

Thank you

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 14:12:22

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

083.1

Comment Log Display

Here is the comment you selected to display.

Comment 83 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Peter
Last Name	Belden
Email Address	peterbelden@gmail.com
Affiliation	
Subject	Vote NO on increased gas taxes
omment	Please do not increase the price of gasoline. I can barely afford to fill my tank with the current prices. I understand the reason behind the desire to reduce CO2 emissions but this is going too far. I do not support this additional tax
	out this is going too ran. I do not support this additional tax.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 14:15:13

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 84 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Monica
	Last Name	Munguia
	Email Address	monimunguia@outlook.com
	Affiliation	
	Subject	Please do not raise gas prices
084.1	Comment	The burden in my family with the increase in gas prices for basic transportation to work and schools is off charts. The possible increase in basic products is an ongoing concern. Please do not raise gas prices. We deserve to live normal lives without the concern on how the future looks here in California.

Attachment
Original File Name

Date and Time Comment Was Submitted 2024-10-11 14:22:58

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 85 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Kellie
Last Name	Wilkie
Email Address	kellie@beachmusic.com
Affiliation	
Subject	Low Carbon Fuel Standard Amendments

085.1 **Comment**

I'm writing to express my concerns about the potential \$0.65 increase in gas prices. I don't understand how you and others in Sacramento fail to see how constant taxation burdens the citizens of this state. How are people supposed to live and support their families under these excessive taxes? And for what? Most of our tax dollars are wasted, with no noticeable improvements. Our gas prices are already the highest in the nation, even compared to Hawaii. Now, you're proposing an additional \$0.65 per gallon, and to implement it after the election. This is deceitful, and your lack of transparency is both concerning and unsurprising. For once, consider how your decisions are affecting the people you're supposed to support.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 14:28:43

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 86 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Tressa
	Last Name	Coburn
	Email Address	tressacoburn@sbcglobal.net
	Affiliation	
	Subject	Gas taxes
086.1	Comment	I cannot believe that you guys think it's a smart choice to raise Californians taxes for gas when we are literally dealing with high inflation and barely making it by. This Hurts lower economical household at a much higher rate think about that

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 14:41:20

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 87 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	llianna
Last Name	Ramirez
Email Address	itty25@yahoo.com
Affiliation	
Subject	Gas price increase
Comment	Hello!
	I oppose gas price increase in California. We are already
	struggling to afford what we are paying now.
	We are one of the highest in the nation .

Attachment

087.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 14:44:01

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 88 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Trish
Last Name	Ponder
Email Address	dmama1967@gmail.com
Affiliation	
Subject	Gas increase
Comment	Our citizens are already at capacity financially. Please please don't pass new legislation for any more gas taxes. We can't afford it

Attachment

088.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 14:54:48

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 89 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Rich
Last Name	Marotti
Email Address	richfm@hey.com
Affiliation	
Subject	Are you kidding?
Comment	Like seriously. Are you fucking kidding me. Gas is already more expensive in CA than HI. That's absurd. Any action taken to increase gas prices is an attack on California citizens.

Attachment

089.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 15:03:40

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 90 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Tom
Last Name	Morgan
Email Address	tom.andrew.morgan@gmail.com
Affiliation	
Subject	Gas Prices

090.1 Comment

Gas prices are already killing us at the pump year over year and
now you think raising prices an avg of .50 cents a gallln is a good
idea? What to push some green agenda? So push us all in to poverty
to complete your vision of the future?
You are not elected by the people of this state therefore you
shouldn't be taking money from us by taxation. Second, if you have
a crap about the environment you'd bring back nuclear and not be
solar projects that are destroying habitats in the desert. Lastly
get on worthless Gov who's dropping billions on a train and start
implementing actual policies that don't dive in to Marxism (such as
yourselves).
The middle class and the poor can't afford your bs.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 15:00:48

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 91 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Shelby
Last Name	Neal
Email Address	shelby.neal@darlingii.com
Affiliation	Darling Ingredients
Subject	Comments on 2nd 15-day change package
Comment	Thank you for considering our comments.
Attachment	www.arb.ca.gov/lists/com-attach/7683-lcfs2024-BmJcOwR3BDtRPgIn.pdf
Original File Name	Darling Comments on 2nd 15-Day Change 10-11-2024.pdf
Date and Time Comment Was Submitted	2024-10-11 15:05:27

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.



October 11, 2024

Steven S. Cliff, Ph.D. Executive Officer California Air Resources Board 1001 | Street Sacramento, CA 95814

Re: Comments on Second Proposed 15-Day Changes to Proposed LCFS Regulation

Dear Dr. Cliff:

We are writing to provide comments on the proposed 15-day change document that was published on October 1, 2024.

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 10%. Renewable diesel is compatible up to 100% in all existing vehicles, equipment, and infrastructure. Following substantial investment, one of our joint venture's renewable diesel plants will be converted to produce approximately 235 million gallons of sustainable aviation fuel (SAF) beginning later this year.

 With the Administrative Procedure Act (APA) deadline fast approaching, we strongly urge the board to approve the proposal without further delay on November 8th. Prompt finalization is necessary to sustain the state's momentum on decarbonization efforts. The ambitious 2025-2029 carbon intensity
benchmarks, particularly the 9% reduction in 2025 along with the Automatic Acceleration Mechanism (AAM) are vital to restoring balance to the credit market and ensuring the program meets its GHG and co-pollutant reduction goals. If non-consensus issues persist after nearly three years of formal and informal rulemaking, we recommend addressing those in a future regulatory process.

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,

Thety / k

Shelby Neal VP - Renewables & Energy Policy

¹ Fresno, Los Angeles, San Diego, San Francisco, Santa Ana, and Turlock.

Here is the comment you selected to display.

Comment 92 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Leslye
Last Name	Roman
Email Address	Helloleslye@gmail.com
Affiliation	
Subject	Do not raise gas prices
Comment	Enough is enough. How do you sleep at night

Attachment

092.1

Original File Name

Date and Time Comment Was Submitted

2024-10-11 15:09:21

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 93 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Glenn
	Last Name	Halperin
	Email Address	glennhalperin@att.net
	Affiliation	
	Subject	Increasing gas tax
093.1	Comment	What makes you think that this help anything? Why are smog checks required on cars built after 1975? That is a 50 year old car.

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 15:14:26

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 94 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Justine
Last Name	Leach
Email Address	Sftbalmom@ymail.com
Affiliation	
Subject	Gas Tax
Comment	I do not want any more taxes added to fuel. I do not support gas taxes!

Attachment

094.1

Original File Name

Date and Time Comment Was Submitted

2024-10-11 15:15:43

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 95 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Alex
Last Name	Young
Email Address	youngisalex@gmail.com
Affiliation	
Subject	Stop the gas tax
Comment	Please stop the gas tax. We can't afford it.

Attachment

095.1

Original File Name

Date and Time Comment Was Submitted

2024-10-11 15:18:20

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 96 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Lori Ann	
Last Name	Haigh	
Email Address	Loriann.haigh61@gmail.com	
Affiliation		
Subject	Greed is a horrible rat hole!	
Comment	Stop raising gas prices! California gas is higher than any state in the country! STOP! money grab is evil! Stop tacking on additional tax to our gas! You are taking advantage!!!	

Attachment

096.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 15:27:13

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 97 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Jasce
	Last Name	Sanders
	Email Address	Jasce.goldsmith@gmail.com
	Affiliation	
	Subject	OPPOSE
097.1	Comment	Speaking for myself and household, we strongly OPPOSE the amendment.

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 15:32:38

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 98 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Roger
Last Name	Webster
Email Address	hedrums@gmail.com
Affiliation	
Subject	Comments on propose "Low Carbon Fuel Standard Amendments"

^{098.1} Comment

Where to begin?

How about this: with China on a coal-fired power plant building spree with no end in sight, this latest madness from you folks will have no measurable effect on air quality or climate change, but it will add more then \$0.50 to the retail cost of a gallon of gasoline & diesel.

Have you completely lost your minds? This latest round of insanity is nothing more than a regressive tax, by definition imposed on those who can least afford it. And you're doing this while the governor is trying to punish oil companies for the high price of gasoline -- yet you want to make it worse!

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 15:31:55

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 99 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	We
	Last Name	ThePeople
	Email Address	Gofuckyourselves@fuckyou.com
	Affiliation	
	Subject	Abolish the CARB
099.1	Comment	You are all worthless cucks and should all lose your jobs for even thinking of taxes us even more than you already do. And I'm sure I speak for the majority of californians when I say, GO FUCK YOURSELVES!

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 15:37:48

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 100 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Lauren
Last Name	Porter
Email Address	Laurenporter@duck.com
Affiliation	
Subject	Oppose CARB gas hike

100.1 Comment

CARB making a horrible decision for inflating/ adding on another gas hike. Despicable and foolish. Leave the hard working Americans alone. We will find the 'others' monies that are in pockets rather than our state soon. Repent and start walking truthfully because it will get a bit uglier. Don't pass that hike.

Thank you. Good luck

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 15:49:22

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

101

Comment Log Display

Here is the comment you selected to display.

Comment 101 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Christopher	
	Last Name	Amaya	
	Email Address	Amayachris1987@gmail.com	
	Affiliation		
	Subject	CARB Rules that will affect gas prices.	
1.1	Comment	I am absolutely against this madness that the CARB is proposing that will raise gas prices. It is blatantly obvious that they do	
		not care about the citizens of California and are only concerned	
		with lining their own pockets. We already pay all this money for	
		gas taxes and yet the roads are still in terrible shape. Stop lying	
		to us and actually do something that will benefit us instead of	
		hurting us	

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 15:52:34

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.
102.1

Comment Log Display

Here is the comment you selected to display.

Comment 102 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Christopher	
Last Name	Amaya	
Email Address	Amayachris1987@gmail.com	
Affiliation		
Subject	CARB Rules that will affect gas prices.	
Comment	I am absolutely against this madness that the CARB is proposing	
	that will raise gas prices. It is blatantly obvious that they do	
	not care about the citizens of California and are only concerned with lining their own nockets. We already nay all this money for	
	gas taxes and yet the roads are still in terrible shape. Stop lying	
	to us and actually do something that will benefit us instead of	
	hurting us	

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 15:52:34

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 103 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Renee
Last Name	Spigarelli
Email Address	Renee_michelle@sbcglobal.net
Affiliation	
Subject	CARB gas increase

103.1 **Comment**

The upcoming gas increase is preposterous. This legislature took a budget surplus and quickly turned it into a deficit based on out of control spending. And now the tax payers who already are dealing with huge inflation and an inability to keep up with increasing costs of food,utilities,etc are going to be subject to a crazy increase in gas. Our gas already is some of the most expensive in the country. Many people already have fled this state and you will continue to push people out based on unaffordability. This legislature pretends it is for the everyday people, but this is a huge burden for the citizens of this state. Shame on you.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 16:14:10

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 104 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Veronica
	Last Name	Spencer
	Email Address	Veronidg@usc.edu
	Affiliation	
	Subject	Proposed gas tax increase
104.1	Comment	The neverending squeeze on Californians' wallets is exhausting. How can we survive like this? I am well educated, make a good living but still am starting to get crushed by the constant increases in gas, taxes, insurance. We already pay so much more for gas than other states so how can anyone in good conscience tell us it still is not enough? We cannot afford this. It should not even be on the table. This has to stop. You are driving people out of this state.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 16:17:52

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 105 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Joseph	
	Last Name	Garrett	
	Email Address	bg@thereefgroup.com	
	Affiliation		
	Subject	Carb Gas Tax Increase	
105.1	Comment	We are struggling to make ends meet with the current inflation. This new tax is unreasonable and should be repealed. This gas ta will only increase the cost of everything as fuel is an aspect in almost every food and service.	

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 16:27:07

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

106.

Comment Log Display

Here is the comment you selected to display.

Comment 106 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Mary
	Last Name	Gordon
	Email Address	gordonjeanne22@gmail.com
	Affiliation	
	Subject	CARB
1	Comment	I am opposed to further taxes and price increases on our fuel. We are the highest of all states right now. I can barely afford to keep gas in my car. You continue to punish consumers. An approximate \$0.65 increase is unbelievable! Please evaluate carefully and consider your friends and neighbors who are struggling to make ends meet every month.

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 16:13:41

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 107 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Chuck
	Last Name	Jones
	Email Address	cej500@earthlink.net
	Affiliation	
	Subject	Higher Gas Prices
107.1	Comment	California already has the highest gas prices in the United States and you have the unmitigated gall to even consider imposing higher prices on gas! Instead you should be helping the good people of California by removing the taxes while we are struggling to pay for groceries. You scumbags keep poking us in the forehead with your incompetence, waste and corruption asking for a fight.

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 17:19:09

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

108.1

Comment Log Display

Here is the comment you selected to display.

Comment 108 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Tina
Last Name	Udell
Email Address	Trutkr27@aol.com
Affiliation	
Subject	Low Carbon Fuel
Comment	No to another tax on gas!!
Attachment	
Original File Name	

Date and Time Comment Was Submitted

2024-10-11 17:37:03

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 109 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Tamara
Last Name	Allee
Email Address	stallee@sbcglobal.net
Affiliation	
Subject	Proposed amendments to low carbon fuel standards
Comment	I urge you NOT to adopt this proposed low carbon fuel standard amendment!

Attachment

109.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 17:39:19

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 110 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Greg
Last Name	Hanoian
Email Address	ghanoian25@gmail.com
Affiliation	
Subject	CARB tax increase

^{110.1} Comment

Dear CARB,
I oppose the increased gas tax possibly coming up. Our air is as
clean as it's ever been and we are taxed enough as it is living in
CA.
Sincerely,
Greg Hanoian

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 17:51:08

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 111 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Aubrey
Last Name	O'Boyle
Email Address	aubreyoboyle@yahoo.com
Affiliation	
Subject	Increase in Gas prices

111.1 Comment

We as the people of California already pay exorbitant gas prices,
more than any of those in our surrounding states. If you care at
all for the people that you are supposed to represent you will not
increase the price is in a time like now. With inflation on every
day goods still hurting those who claim to care about most minority
and lower income families, and gas prices amongst the highest in
the nation. It is unacceptable that this is even coming up as an
option. don't tax people on gas.! don't take essential every day
goods and make them a play toy for you to gain more money to spend
without a thought! this tax increase coming up, shows your lack of
awareness for those that live in your state, with the highest home
prices, the highest gas prices, and some of the highest energy
prices you are driving more U-Haul sales out of state with every
allowance of these types of measures. put the people before your
pocketbooks and say no to this increase in gas taxes!!!

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 17:56:24

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 112 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Penny
Last Name	Harrington
Email Address	penny.harrington@cox.net
Affiliation	
Subject	Enough is enough

112.1 Comment

Ladies and gentlemen:

I implore you to oppose any increase to the gas tax in our state. We are already paying more than most other locales and just can't endure even higher prices at the pump.

The middle and lower classes are already hard-hit with inflated prices for groceries and other goods, and this will only get worse if fuel charges for moving goods from manufacturers and growers to retail sellers increase the prices of food and necessities.

Seniors on fixed incomes have no discretionary income to cover additional fuel charges. Workers can ill afford to pay more just for their commute.

Please do the right thing for Californians and stop the gas tax hike. Enough is enough.

Respectfully submitted...

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 18:17:08

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 113 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Martha
Last Name	Kerstner
Email Address	mkerstner@gmail.com
Affiliation	
Subject	CARBs plan to raise gas prices
Comment	We can NOT afford to pay more for gas! Do not add more taxes and fees to our gas!!!!

Attachment

113.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 18:21:14

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 114 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Bettina
	Last Name	Miller
	Email Address	Bloominbee123@icloud.com
	Affiliation	
	ubject Carb Gas tax increase	
114.1	Comment	I am infuriated and opposed to this gas tax increase why are we the people paying for Sacramento's incompetence??? Robbing Peter to pay Paul is all you seem to be capable of doing

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 18:31:11

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 115 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Carla
	Last Name	Birmingham
	Email Address	Carlab32@gmail.com
	Affiliation	
	Subject	Taxes on gas
115.1	Comment	It beyond me how you want to put even more taxes on gasoline. It extremely irresponsible to the people of California. Our reputation in CA is n jeopardy.

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 19:37:06

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 116 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Cherie
	Last Name	Doudna
	Email Address	cheriedoudna@gmail.com
	Affiliation	
	Subject	Gas hike
116.1	Comment	I oppose any and all gas prices increase for any and all reason and any and all times.

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 19:54:56

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 117 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Matthew	
	Last Name	Kelly	
	Email Address	mattkelly1875@gmail.com	
	Affiliation		
	Subject	ject Gas tax increase	
117.1	Comment	You are squeezing us for all we're worth and driving even more people from this state. Stop killing your middle class this is untenable. We are more than just your tax slaves.	

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 19:58:25

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 118 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Cynda
Last Name	Ontiveros
Email Address	Cyndaontiveros@gmail.com
Affiliation	
Subject	I strongly OPPOSE the increase in gas prices due to your latest ruling

118.1 Comment

This decision to further micromanage the gas industry is a new level of our state's mismanagement. We already have the highest gas prices in the nation and increasing the cost of gas by 65 MORE cents per gallon is criminal. Democrats purport to care about the "little guy"-- the working poor and the middle class- and all you are doing is purposely making life more difficult for anyone who drives a gas powered vehicle. Our state has nowhere near the infrastructure to maintain and increase the number of electric vehicles so your campaign to punish those of us who still use gas is insane..The level of arrogance and blind party-politics is truly reprehensible!

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 19:59:50

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.
Here is the comment you selected to display.

Comment 119 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Karla	
Last Name	Curiel	
Email Address	Karlm2007@hotmail.com	
Affiliation		
Subject	Gas prices	
Comment	Raising gas prices will put an additional strain on families like mine. Please reconsider!!	

Attachment

119.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 20:11:03

Here is the comment you selected to display.

Comment 120 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Mathilda	
	Last Name	Dickey	
	Email Address	mdickey63@gmail.com	
	Affiliation		
	Subject	Gas prices	
120.1	Comment	Enough is enough. Stop making the workers in California slaves with your gas prices for your crazy woke policies. It should be voluntary and you'll see what people think of your policies. You son be happy til every tax payer leaves California.	

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 20:34:39

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 121 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Rita	
Last Name	Tayenaka	
Email Address	rita@rita4homes.com	
Affiliation		
Subject	GAS TAX	
Comment	WE NEED TO STOP THIS GAS TAX - OUR GAS IS CRAZY HIGH ALREADY- WHY DO YOU NEED MORE TAXES. STOP	

Attachment

121.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 20:45:18

Here is the comment you selected to display.

Comment 122 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Wyndy
Last Name	Nichols
Email Address	macawyndy@yahoo.com
Affiliation	
Subject	Opposed to increase refinery fees

122.1 Comment

Hello, I am writing as a citizen of California to oppose the
increased fee stated above. California already has the most
expensive gas in the nation and with the way this state is going
increasing fees that will be passed on to taxpayers at the pump
doesn't make sense. California government continues to increase
fees and taxes only for the middle class to shrink. Please rethink
adding additional fees that take money out of hard working tax
payers.
Thank you.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 20:51:17

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 123 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	David
Last Name	Fults
Email Address	Dafults@gmail.com
Affiliation	
Subject	stricter limits on the carbon intensity of fuels
Comment	I oppose stricter limits on the carbon intensity of fuels.

Attachment

123.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 21:05:30

Here is the comment you selected to display.

Comment 124 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Todd
Last Name	Swanson
Email Address	Swanytodd@hotmail.com
Affiliation	
Subject	Gas tax
Comment	WE CAN NOT AFFORD HIGHER GAS PRICES!!

Attachment

124.1

Original File Name

Date and Time Comment Was Submitted

2024-10-11 21:23:37

Here is the comment you selected to display.

Comment 125 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Kerry
	Last Name	Wigginton
	Email Address	kwig6@hotmail.com
	Affiliation	
	Subject	Gas price increase
125.1	Comment	We are hurting already to put food on the table and gas in our cars. Poor handling of our tax dollars does not give you the right to gouge us with higher gas prices. Vote no on any gas pricing increases that will hurt we the people.

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 21:23:07

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 126 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Charity
	Last Name	Sy
	Email Address	pylorix@yahoo.com
	Affiliation	
	Subject	CARB law
126.1	Comment	Please do not raise our gas tax again! Californian's already pay the highest gas prices, rent/mortgage, taxes in the nation. Average working citizen's are struggling.

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 21:27:08

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 127 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Michael	
	Last Name	Kupferstein arosesshadow@gmail.com	
	Email Address		
	Affiliation		
	Subject	Unconstitutional Taxing of gas	
127.1	Comment	You cannot in your wildest dreams defend with reason why we should allow you to raise our gas taxes even more, again! On top of the multiple raises this past year and every single July even during Covid, most states repealed and or credited their people for the unjust living expenses already being dealt with. We the People will not stand idly by and be stuck with yet another tax hike on our already most insane prices in the country. Cease and desist with this nonsense. Please!	

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 21:27:12

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 128 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Pino	
	Last Name	Bogedahl	
	Email Address	Pino.001@hotmail.com	
	Affiliation		
	Subject	New oil regulations proposal	
128.1	Comment	Please, stop adding more oil regulations that will potentially higher the gas prices. Gas is already extremely expensive here in California. If you really care about the people of California, you need to stop this maddeness, we can't take this high prices anymore. Sincerely, Pino Bogedahl	

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 21:34:56

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

129.1

Comment Log Display

Here is the comment you selected to display.

Comment 129 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Jacob
Last Name	Bogedahl
Email Address	Jbogedahl@live.com
Affiliation	
Subject	Stop the insanity
Comment	Please stop the insanity.
Attachment	
Original File Name	

Date and Time Comment Was Submitted

2024-10-11 21:45:25

Here is the comment you selected to display.

Comment 130 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Kellie
	Last Name	Pauley
	Email Address	teampauley@comcast.net
	Affiliation	
	Subject	California gasoline taxes
130.1	Comment	We already pay too high of gasoline taxes in California. I urge the California government to oppose any new gasoline taxes. My home state is unrecognizable and far too expensive. Please represent your constituents and the hard working citizens of California. Thank you.

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 21:50:20

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 131 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Rebecca
Last Name	Rodriguez
Email Address	Rebeccar424@gmail.com
Affiliation	
Subject	Opposition to proposed gas tax
Comment	Gas is already too expensive - NO to additional taxes

Attachment

131.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 22:10:04

Here is the comment you selected to display.

Comment 132 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Tate
Last Name	Aslanjan
Email Address	tatkatatka@yahoo.com
Affiliation	
Subject	Gas price increase
Comment	We have one of the highest gas prices in the country. Why is this price increase is necessary? I vote against

Attachment

132.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 22:09:59

Here is the comment you selected to display.

Comment 133 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Erica
Last Name	Villa
Email Address	Missericavilla@gmail.com
Affiliation	
Subject	Stop Gas increase
Comment	Stop increasing our gasoline! I can barely afford my life.

Attachment

133.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 22:12:19

Here is the comment you selected to display.

Comment 134 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Tanya
Last Name	Spangler
Email Address	tanyaspence@yahoo.com
Affiliation	
Subject	No ride to gasoline prices
Comment	I am against a rise in gasoline prices.

Attachment

134.1

Original File Name

Date and Time Comment Was Submitted

2024-10-11 22:12:58

Here is the comment you selected to display.

Comment 135 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Kalop
Last Name	Harvey
Email Address	kalopharvey@gmail.com
Affiliation	
Subject	New rule that could raise fuel prices .4565

135.1	Comment

This will have dire consequences on the citizens of California.
We already pay some of the HIGHEST FUEL PRICES in the country due
to having
one of the highest fuel taxes in the country.
We pay almost the highest income taxes in the country, top to
bottom not just the wealthy.
Food prices are up about 50-75%
Housing costs are up nearly 100% over two years ago.
We cannot sustain a rule change on behalf of unelected bureaucrats,
that have ZERO
accountability to the people that will affect fuel costs in a state
that relies heavily
on transportation for commuting.
You have ZERO right to create rules that will affect the costs of
products on people who did not elect you to create rules/laws.
•
We have a legislation to create rules and laws, you are not part of
that body and should not have the ability to CREATE new rules on a
whim.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 22:20:51

Here is the comment you selected to display.

Comment 136 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Johana
Last Name	Delgado
Email Address	johana.pat@gmail.com
Affiliation	
Subject	Oppose CARB gas tax increase
Comment	I vehemently oppose CARB increasing the gas tax with its rule. Californians already pay ungodly pricing at the pump that no other states do.

Attachment

136.1

Original File Name
Date and Time Comment Was Submitted 2024-10-11 22:33:50

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 137 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	annie	
	Last Name	clougherty	
	Email Address	annieriggs@hotmail.com	
	Affiliation		
	Subject	gas tax	
137.1	Comment	To whom it may concern,	
		As a lifelong Californian, I have become aware how much you are	
		taxing us. California does not show the taxes on our receipts for	
		the gas that we pay and to increase any further our gas tax is	
		absolutely Fluiculous. Fou cannot continue to tax us like this! We	
		We are aware of what is occurring. This needs to stop now	
		we are aware of what is occurring. This needs to stop now.	

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-11 22:32:41

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

138.1

Comment Log Display

Here is the comment you selected to display.

Comment 138 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Debra
Last Name	Cummings
Email Address	debra@sanddesign.com
Affiliation	
Subject	Gas prices
Comment	No more gas price himes
Attachment	
Original File Name	
Date and Time Comment Was Submitted	2024-10-11 22:40:16

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 139 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Venessa	
	Last Name	Meza	
	Email Address	vingabe0711@aol.com	
	Affiliation		
	Subject	Do not raise our gas prices	
1	Comment We already pay the most for gas in this country. The horrible, everybody is paying more and more for ever and despite already paying high gas prices, you wan that already high price!? Please do not do this to California.		

Attachment

139.

Original File Name

Date and Time Comment Was Submitted

2024-10-11 23:42:28

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 140 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Philipp
	Last Name	Lomboy
	Email Address	phil.lomboy@gmail.com
	Affiliation	
	Subject	Enough gas increases
140.1	Comment	Stop with all the regulation that is driving gas prices through the roof. You are hurting the people of CA with your bureaucratic power grabs.

Attachment

Date and Time Comment Was Submitted 2024-10-12 00:19:44

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 141 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Lara Lei
	Last Name	Bailey
	Email Address	Laraleibailey@yahoo.com
	Affiliation	
	Subject	Gas tax?!!
141.1	Comment	I am strongly against any further taxes on gasoline! As a matter of fact you need to roll back some of the taxes that already exist!! Our gas prices are RIDICULOUS!

Attachment

Date and Time Comment Was Submitted 2024-10-12 02:02:37

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 142 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Mari	
	Last Name	Valluzzi	
	Email Address	Mvalluzzi14@gmail.com	
	Affiliation		
Subject Opposition to amendment		Opposition to amendment	
142.1	Comment	I am opposed to any amendment that would further increase the gas tax. CA has been leading the nation in the most expensive gas prices for far too long. We don't need another amendment that would keep the gas prices high. It's too hard to live in CA as it is currently, you should be trying to help your residents, not making it harder.	

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-12 07:09:28

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 143 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Jessica	
	Last Name	Hekman	
	Email Address	jesshekman@hotmail.com	
	Affiliation		
	Subject	Please do not raise gas prices	
143.1	Comment	We are already taxed to death and struggling in California. I am very much against more unnecessary taxes on gas. No more gas taxes. We already pay so many taxes on gas which is why California has the highest gas prices by far.	

Attachment

Date and Time Comment Was Submitted 2024-10-12 07:29:48

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 144 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Jeremy
	Last Name	Mattson
	Email Address	mattsonjt69@gmail.com
	Affiliation	
Subject Vote NO on additional refinery fe		Vote NO on additional refinery fees
144.1	Comment	You are not an elected board. The only taxes and fees that should be raised are by the vote of the people. Vote NO on any additional fees or taxes placed on the refinery. This includes other EPA and air quality requirements as well. You should not have the power to create any regulations that raise anybody's fees or taxes.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-12 07:44:42

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

145.1

Comment Log Display

Here is the comment you selected to display.

Comment 145 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Gina	
Last Name	Martin	
Email Address	haybalers@msn.com	
Affiliation		
Subject	DON'T raise gas tax	
Comment	Please do NOT raise the gas tax. This may not affect the upper income class but it is horrible for the poorest of our population. It not only increases the cost to fill our tanks but will ripple through costs for small businesses. This in turn increases the costs of goods for everyone. PLEASE DO NOT RAISE OUR TAXES ON GAS !!!	

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-12 07:44:43

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 146 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Joseph	
Last Name	Villanueva	
Email Address	scorp16j@aol.com	
Affiliation		
Subject	No to the new gas increase	
Comment	Stop! Stop raising the price of gas. It is outrageous and it needs to stop! In the words of our President and Vice President, "Don't!" Stop making our lives worse in this state!	

Attachment

146.1

Date and Time Comment Was Submitted 2024-10-12 08:42:47

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 147 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Jessica
Last Name	McMann
Email Address	jn.mcmann@hotmail.com
Affiliation	
Subject	NO

147.1 Comment

Californians already pay the highest gas taxes in the country,
raising them even more is going to ultimately create a bigger purge
of people fleeing this collapsing state. Less people=less tax
revenue. This move to try and force citizens to all electric
vehicles is futile, under the gise of "reducing carbon emissions".
There aren't enough resources for it to be sustainable, which is
already apparent when the government asks people not to charge
their vehicles because of the burden on the grid. It makes
absolutely no sense. How about we set it motion standards for the
taxes that are already collected to be spent in a responsible
manner?
Your entity was not elected by the people.
No more wasteful spending
No more taxes.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-12 09:14:59

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 148 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Wendy
Last Name	Diaz Delgado
Email Address	gdsgrl88@hotmail.com
Affiliation	
Subject	Opposed
Comment	Please consider the cost of living in California. This will increase gas costs to the public that is already suffering

Attachment

148.1

Original File Name

Date and Time Comment Was Submitted 2024-10-12 09:45:06

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 149 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Ann
Last Name	Woods
Email Address	Awoods270@hotmail.com
Affiliation	
Subject	Amendment to raise taxes
Comment	Do not raise our gas taxes. California has an extremely high gas tax already!

Attachment

149.1

Original File Name

Date and Time Comment Was Submitted 2024-10-12 10:34:39

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 150 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Randy
	Last Name	Woods
	Email Address	Rwoods270@hotmail.com
	Affiliation	
	Subject	Amendment to raise gas taxes
150.1	Comment	Our gas taxes are already a National joke! Do NOT raise the gas tax!
		Perhaps consider reducing spending???

Attachment

Date and Time Comment Was Submitted 2024-10-12 10:39:16

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 151 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	catherine
	Last Name	salaiz
	Email Address	katesalaiz@gmail.com
	Affiliation	
	Subject	gas tax
151.1	Comment	I strongly oppose any gas tax to be implemented for any Californians. We already pay the highest gas in the nation, yet see little Benefit from these tax hikes.

Attachment

Date and Time Comment Was Submitted 2024-10-12 10:45:59

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 152 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Alison
Last Name	Riley
Email Address	harriedmom@gmail.com
Affiliation	
Subject	Raising fuel prices

152.1 Comment

Dear Board Members,

As a teacher who has to commute to work daily (as home prices mostly prohibit service people from living near their work) higher gas prices will be quite detrimental. If your goal is to push people to leave California you are succeeding. My court in Gilroy has lost several households to Idaho and Texas. Please let us stay in California and keep teaching. Do not add more taxes to those who do not have a choice to not commute.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-12 12:02:29

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 153 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Wes
Last Name	Morgan
Email Address	wes-morgan@sbcglobal.net
Affiliation	
Subject	Low carbon standards
Comment	I am against the carbon reduction proposal that will increase gas prices by as much as 65 cents per gallon. Please remove this from any future action.

Attachment

153.1

Date and Time Comment Was Submitted 2024-10-12 12:12:29

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 154 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Lynne
Last Name	Morgan
Email Address	lynne.c.morgan@sbcglobal.net
Affiliation	
Subject	Low carbon standards
Comment	I am against the carbon reduction proposal that will increase gas prices by as much as 65 cents per gallon. Please remove this from any future action.

Attachment

154.1
Date and Time Comment Was Submitted 2024-10-12 12:12:29

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 155 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Allison
	Last Name	В
	Email Address	H2obabe12@yahoo.com
	Affiliation	
	Subject	Gas tax
155.1	Comment	The idea of raising the highest gas tax in the United States even more during one of the biggest inflation and recession times in recent history is absolutely insane. Vote no on this. It is a must. When people wonder why California is losing this is exactly the reason. Do better managing the revenue from the current gas tax instead of inflicting more financial pain on residence that can't
		afford it

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-12 13:01:53

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 156 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Aracely
Last Name	Covarrubias
Email Address	Covarrubias.aracely@gmail.com
Affiliation	
Subject	Opposition to proposed gas price increase due to New Rule

156.1 Comment

Dear CARB Board Members,
I am writing to express my strong opposition to the proposed rule
that could increase gas prices by an additional 45-65 cents per
gallon. I believe this measure will disproportionately impact
working-class families, small businesses, and rural communities who
rely on affordable fuel for daily life.
In an already expensive state, a significant gas price hike will
exacerbate the financial burden on Californians struggling with
high living costs. Increased transportation costs will also drive
up the price of essential goods and services, further harming those
who can least afford it. For many residents, public transportation
or electric vehicle options are either unavailable or financially
out of reach, making gasoline a necessity, not a choice.
Additionally, California has the highest gas taxes in the nation,
and the proposed rule seems to overlook the cumulative economic
strain already placed on residents. I believe CARB can pursue its
environmental goals through alternative means that do not place
such an immediate financial burden on families and businesses.
l urge CARB to consider solutions that balance environmental
objectives with the economic well-being of all Californians, such
as further investment in sustainable fuel research, incentivizing
cleaner technologies.
Thank you for your attention to this important matter.

Sincerely, Aracely Covarrubias

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-12 13:22:22

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 157 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Helena
Last Name	Parker
Email Address	hparkr@gmail.com
Affiliation	
Subject	Enough is enough
Comment	CA residents can't afford any more taxes. Find the money elsewhere.

157.1

Original File Name

Date	and	Time	Commen	t Was
Subr	nitte	d		

2024-10-12 13:28:24

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 158 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Rebecca
Last Name	Oriol
Email Address	oriolrebecca.bchs@gmail.com
Affiliation	
Subject	Higher Prices

158.1 **Comment**

To the Esteemed Unelected Board,

It's time to take a pause on new measures that lead to higher prices of an everyday necessity. The California economy is already too expensive for most people who live here, and adding another 45-65 cents per gallon of gas is ludicrous and out of touch with the reality of everyday Californians.

Vote 'no' and give Californians a break. We need it.

Thanks,

A tired voter and taxpayer

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-12 13:33:43

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 159 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Jessica
	Last Name	Godde
	Email Address	jessicagodde@gmail.com
	Affiliation	
	Subject	l oppose
159.1	Comment	I oppose any additional taxes and price increases for gasoline and diesel. Maybe California should manage their funds better instead of taxing citizens out of their hard earned income that's forcing many to leave the state altogether. Enough is enough.

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-12 13:41:11

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 160 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Julie
	Last Name	Morgan
	Email Address	Juliemorgan01@yahoo.com
	Affiliation	
	Subject	Gas price increase again!
160.1	Comment	I'm against any new has increases and please repeal the already \$1.08 tax on our had in california. Thank you.

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-12 14:16:23

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 161 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Kerry
Last Name	Johnson
Email Address	Kerrymjohnson@gmail.com
Affiliation	
Subject	Gas tax increase

161.1 **Comment**

To whom it may concern:

As a resident of California, I am deeply opposed to the gas tax increasing. Our state currently pays the most in the country for gas. If other states can off gas for less money, why then do lawmakers perpetually want to tax their constituents more for gas? It feels a lot like taxation without representation, not unlike the taxation without representation with which the Founders dealt.

Please remember you serve the people of this great State. Many voices are speaking up in oppositio to this gas tax, like mine.

Thank you for your time.

Kerry Johnson

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-12 14:57:12

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 162 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	CHRIS
Last Name	BRIMHALL
Email Address	brimmie1608@gmail.com
Affiliation	
Subject	Tax increase
Comment	As a life long Californian and senior I must protest the continued taxation of California citizens. Stop taxing us incessantly and cut spending

Attachment

162.1

Original File Name

Date and Time Comment Was Submitted 2024-10-12 16:03:44

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 163 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Daniel
Last Name	Gewickey
Email Address	chasing_the_son_86@hotmail.com
Affiliation	
Subject	Proposed Low Carbon Fuel Standard Amendments (Icfs2024

163.1 Comment

Don't	you	DARE	add	more	taxes	and	make	gas	pric	es	wors	e th	an tl	ney
alread	dy ar	re!!!												
No one	e car	n aff	ord	anyth:	ing in	CA	as it	is,	and	add	ing	more	tax	es
will o	only	make	thi	ngs w	orse.	Sto	p wit	h the	e nor	isen	se,	and	find	ways
to CU	T tax	kes, I	not	raise	them.									
Since	rely,	,												
A Nor	mal F	Perso	n tr	ying [.]	to sur	vive								

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-12 21:54:42

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

164.

Comment Log Display

Here is the comment you selected to display.

Comment 164 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Jacquelyn
	Last Name	Landreth
	Email Address	Jackie@Jlandreth.com
	Affiliation	
	Subject	Do not raise gas prices again
1	Comment	Do not raise gas prices again. The people of California are already
		suffering with the highest gas prices in the nation, mainly due to
		gas taxes. Please figure out how to streamline the many agencies so
		the taxes already being charged can more efficiently and
		effectively be spent. Living in California is becoming more and
		more intolerable with the huge inflation and constantly increasing
		taxes.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-13 12:24:06

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 165 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Doug
Last Name	Padgett
Email Address	doug@totallykids.com
Affiliation	
Subject	Proposed Low Carbon Fuel Amendments

165.1 **Comment**

I understand you are proposing amendments to the Low-Carbon Fuels Standard (LCFS) program. I urgently request you delay the vote until updated cost projections are provided to the public. The carbon emitted by the ships bringing foreign oil to our state FAR EXCEEDS the carbon emitted by all our vehicles in this state combined, yet you are forcing our oil wells and refineries IN THIS STATE to restrict their utilization and capacity. This process is costing me dearly at the gas pump. Now you want to make it worse with your amendments, without due consideration to the impact on me and all of us as citizens.

Reconsider your policies at every level and bring back robust IN-STATE oil production.

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-16 04:19:02

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 166 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Asher				
Last Name	Goldman				
Email Address	asher@generatecapital.com				
Affiliation	Generate Capital				
Subject	Generate Capital Comments on Proposed Amendments to LCFS				
Comment	Please see the attached comments from Generate Capital on the proposed amendments to the LCFS program				
Attachment	www.arb.ca.gov/lists/com-attach/7806-lcfs2024-BmJCa1YIW2kiem0d.pdf				
Original File Name	Generate Capital Comments on LCFS_10.16.2024_vF.pdf				
Date and Time Comment Was Submitted	2024-10-16 13:18:36				

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.



October 16th, 2024

Matt Botill Chief, Industrial Strategies Division California Air Resources Board 1001 I Street, Sacramento, CA 95814

Mr. Botill and CARB Staff,

I am writing to you on behalf of Generate Capital, PBC ("Generate") regarding the latest proposals for amendments to the Low Carbon Fuel Standard ("LCFS"). As a leading sustainable infrastructure company based in San Francisco, Generate is dedicated to building, owning, operating, and financing infrastructure solutions that address critical needs across clean energy, transportation, water, waste, agriculture, and smart cities. Since our founding in 2014, we have partnered with technology- and project developers to deliver sustainable resources to over 2,000 customers, including companies, communities, school districts, and universities.

We greatly appreciate the hard work and perseverance of CARB staff throughout this rulemaking process. We know better than most how instrumental CARB's leadership has been in fostering innovation and investment in low-carbon infrastructure, and your receptiveness to stakeholder feedback has been commendable. You have a hard job, and you have done it well.

While we have identified several areas in which we believe further improvements could be made, we unequivocally endorse the overall rulemaking package. The consequences of delaying or not finalizing this package would be catastrophic to the efforts to decarbonize California's largest emitting sector: transportation. In the body of this letter, we will outline several key points, including our recommendation to raise the 2030 carbon intensity (CI) reduction target to 35%, our support for the Auto Acceleration Mechanism ("AAM"), and our concerns regarding specific provisions on RNG and fossil jet fuel. We hope you take each of these points as feedback for how to improve to the LCFS program through guidance over the coming weeks and months, but do not confuse these with reasons for the board to not adopt the currently proposed rule.

We appreciate your consideration of our views and look forward to continuing our collaboration with CARB to ensure that the LCFS program remains a driving force in marshalling private capital towards the fight against climate change.

Sincerely,

Asher Joldman

Asher Goldman Vice President Generate Capital



Support for Approval of the Rulemaking Package

After years of engagement on the changes needed to the LCFS program, we are pleased that CARB is close to adopting sorely needed new rules. **We endorse the proposed LCFS rulemaking package and strongly urge CARB to approve it without delay.** As is true with any compromise, there are aspects of the rule which we would have preferred to see adjusted, but it should be said unequivocally that any failure to act would be disastrous for the goal of decarbonizing California's transportation sector, which remains the state's largest emitter of greenhouse gases.

CARB's careful navigation through the difficult terrain of managing stakeholder input from diverse, and sometimes opposing, interests has been remarkable, and your commitment to finding balanced solutions has been critical. The time for action is now. The board's approval of this package will ensure California remains a leader in climate policy and a model for other states and countries to follow.

166.1 Expand the LCFS's Total Ambition to Target 35% CI Reduction in 2030

While we support the increase of the 2030 CI reduction target to 30%, we believe this figure is insufficient in light of recent market data. The change to the 2030 target from 20% to 30% is necessary and welcome, but a 30% target is not enough to keep the market from overheating. The market has consistently overperformed, and it is now highly probable that the market will exceed a 30% CI reduction by 2030. Instead, **we propose CARB adopt a 35% CI reduction target for 2030** which will push the market towards further investment in climate solutions and will come closer to aligning transportation, the state's largest source of emissions, with California's overall ambition of cutting emissions by 48% by 2030.

While the proposed rule does institute other safeguards against significant market overperformance (such as the Auto-Acceleration Mechanism, the "AAM"), setting a 30% target for 2030 would put the market in the position of effectively relying on the AAM to get the CI reduction targets right, rather than treating the AAM as a backstop mechanism. This would risk leaving the market imbalanced for long periods, stifling investment in critical low-carbon infrastructure as the market oscillates between boom and bust. Instead, a 35% target would send a strong signal to the market that it is time to invest in decarbonization at scale. It would encourage capital deployment and infrastructure development now rather than waiting for the market to falter before the AAM is triggered and costing us time which we do not have to avoid the worst consequences of climate change. This higher target would align with the pace of progress that California has already demonstrated is possible and with the broader decarbonization targets for California's economy.

166.2 Support for the Inclusion of the AAM, and Proposal to Perfect the AAM

We strongly endorse the inclusion of the AAM in the rulemaking package. Given the large uncertainty inherent to any modeled forecast of a system as complex as California's transportation system, including this sort of safeguard is paramount to ensuring the continued ability for the LCFS to drive decarbonization outcomes.

GENERATE

166.2 We are pleased to see the latest proposal with a rolling four-quarter triggering Cont. mechanism in place of the rigid calendar-year method. This change will better reflect when overperformance justifies intervention. An aspect of this change which we would like CARB to clarify is the schedule to update the CI reduction targets when the triggering period is not a calendar year. If, for example, the AAM were triggered based on the period of 2027 Q2 – 2028 Q1 (meaning the market would have the period's data) on 7/31/2028), the proposed rule does not specify if the CI targets would be amended for the 2029 calendar year (the proximate January 1) or not until the 2030 calendar year (the January 1 following the proximate May 15). §95484(c)1 of the regulation indicates that CARB will post updated CI schedules on May 15 of each year, meaning an offcalendar-year triggering would not impact the CI targets for as long as 2.75 years after the beginning of the triggering period. This is too slow of a response to be a meaningful safeguard to market overperformance. §95484(c)2, however, supports the idea that new CI targets would go into effect on the proximate January 1, a year sooner than would result from waiting until the following May 15 to announce what the market already knows to be true well before then. We recommend that CARB provide guidance clarifying that the CI reduction targets are to be adjusted on the proximate January 1 to the data release demonstrating the conditions to trigger the AAM have been met and that updated CI reduction targets will be posted on 2/15, 5/15, 8/15, or 11/15.

> An additional area we would like to see refinement in the weeks and months following the passage of this rulemaking is regarding the magnitude of the "acceleration" when the AAM is activated. Whereas the currently proposed rule advances CI reduction targets by one year, a stronger system would adjust future CI targets by the actual amount of overperformance relative to the CI target. While pulling forward the CI targets by one year certainly has appeal in its simplicity, there is no guarantee that such a magnitude would be the appropriate response in all cases and could represent an under- or over-correction. Instead, calculating the AAM's magnitude based on the degree to which the market is overperforming its targets and increasing future CI reduction targets by the same amount will ensure that the adjustment is appropriately calibrated for any degree of overperformance and allow the LCFS to continually drive decarbonization.

166.3 Include a Safe Harbor for Avoided Methane Crediting Periods

We commend CARB for considering market feedback and iterating on the proposal which would reduce the LCFS's recognition of the benefits of avoiding methane emissions. The new amendment to the proposal, retaining the existing rules on crediting periods for existing projects, demonstrates CARB's role as a steady partner for market participants. For infrastructure assets with useful lives of several decades, it is vital for investors and project developers to be able to rely on regulatory stability for existing projects if they are going to be able to invest in new projects across any technology. This response to market feedback helps to provide that level of trust.

The currently proposed rule rightly excludes retroactive changes to existing projects, but there remains a potential gap for projects already under development or in early operations which have not yet received pathway approvals. The timeline from project conception to achieving a certified pathway is often lengthy due to the time-consuming



166.3 Cont. process of infrastructure development and construction, and due to the current backlog of pathway reviews at CARB. For many technologies, it is often 5 years or more from final investment decision to obtain a certified pathway; for large scale developments such as those for sustainable aviation fuel ("SAF"), the timeline can approach 10 years.



We propose that CARB work with market participants to issue further guidance on the regulation to clarify that the rule allows for a safe harbor, similar to what the Federal government has for years used for investment tax credits ("ITC") eligibility. This would provide much-needed stability and confidence for investors, who should not be forced to guess whether there will be policy changes during the 5-10 years between allocating capital to a project and the pathway being certified. To motivate capital towards the decarbonization of California's transportation sector, CARB can help remove financial friction through this clarification.

166.4 Maintain Existing Rules for RNG Deliverability

We urge CARB to reconsider the proposed rules regarding the physical deliverability of RNG included in the latest rulemaking package. There is no environmental benefit from this requirement; it would serve solely as a thumb on the scale to disfavor one type of decarbonization solution at exactly the moment when we cannot afford to be picky about which types of climate solutions we promote. Physical deliverability rules would result in many RNG projects shutting down and would result in increased methane emissions, counter to CARB's and California's overarching goals.

The environmental benefits of RNG are predominantly achieved upstream through methane emission abatement; after that point, the RNG is chemically identical to fossil gas and there are no climate advantages to requiring physical delivery of these molecules. For the upstream activity to occur, though, there must be an economically viable end market for the downstream product; the LCFS market has enabled methane abatement to be economically attractive, which is why we have seen such outstanding progress made on reducing methane emissions over the past several years.

This proposed rule, however, would add unnecessary complexity and barriers for methane abatement projects, particularly for existing projects that were developed under the assumption that CARB's prior set of rules would hold. The proposed deliverability rule ignores the operational realities of the American natural gas distribution system, which is based on mass balancing (a system approximating the book-and-claim methodology already used in the LCFS) rather than a point-to-point delivery system. Given this, **it is entirely unclear if the proposed rules are even possible to comply with**. Further, the contingent trigger based on ZEV adoption means that investors and developers will be in the dark as to what the future economics of their



166.4 Cont. projects will be; this will mean only expensive, risk-seeking capital will finance these projects, slowing methane abatement and making the outputs more expensive for consumers.

We urge CARB to reconsider this requirement, as it threatens both the viability of existing projects and the potential for investment in future methane abatement.

166.5 Reincorporate Fossil Jet Fuel as a Deficit Generator

We remain surprised by the decision to remove fossil jet fuel as a deficit generator from the previous 15-day package. The absence of deficits from fossil jet fuel will significantly reduce the financial pressure on the aviation industry to adopt SAF, a key element in the decarbonization of air travel.

The rationale provided in August 2024 contradicts the core philosophy of the LCFS: that pricing carbon emissions and reductions incentivizes the adoption of low-carbon alternatives. At the time, CARB provided commentary saying that the waiver from deficit production for fossil jet fuel was maintained because removing it "did not guarantee that airlines would procure and use alternative jet fuel". That represents a misunderstanding of the power of the LCFS program, in which no specific fuel is ever mandated but instead California sends pricing signals to market actors to invest in and deploy low carbon fuels. If that sounds too theoretical, consider what we have regularly seen in the market: SAF projects have struggled to obtain financing because the airlines procuring the fuel are not willing to pay meaningfully more than the price of fossil jet fuel. By pricing the emissions from fossil jet fuel, the LCFS would create the economic imperative for airlines to account for the cost of carbon into the price they pay for low-CI alternatives, thereby enabling substantially more capital to fund the deployment of SAF production capacity.

Further, the inclusion of fossil jet fuel as a deficit generator would not preclude additional action – by CARB or by California's legislature – to mandate the adoption of sustainable aviation fuel. The decarbonization of air travel will require multiple policy drivers and these two are certainly not mutually exclusive but rather reinforcing.

Without fossil jet fuel as a deficit generator, California risks slowing progress in reducing emissions from one of the most challenging sectors to decarbonize. We urge CARB to **reinstate fossil jet fuel as a deficit generator** to ensure the aviation industry contributes to California's broader climate goals.

Thank you once again for your hard work in advancing the LCFS program. We believe that the adjustments outlined in this letter will further strengthen the program, stimulate private investment, and accelerate California's decarbonization efforts. We look forward to continued collaboration with CARB to ensure the success of the LCFS.

Here is the comment you selected to display.

Comment 167 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Brian
Last Name	McDonald
Email Address	bcmcdonald@marathonpetroleum.com
Affiliation	
Subject	MPC Comments on CARB LCFS 2nd 15-day proposal
Comment	
Attachment	www.arb.ca.gov/lists/com-attach/7808-lcfs2024- AGUQNVE4BDoAZM0d.pdf
Original File Name	CARB LCFS Proposed Regulation Comments_2nd 15 day.pdf
Date and Time Comment Was Submitted	2024-10-16 13:24:06

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.



Marathon Petroleum Company LP

539 South Main Street Findlay, OH 45840 Tel: 419.422.2121 Fax: 419.425.7040

SUBMITTED ELECTRONICALLY

October 16, 2024

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

Re: Comments on the California Air Resources Board's (CARB) Proposed Second 15-Day Changes to the Proposed Amendments to the Low Carbon Fuel Standard (LCFS)

Dear Chairwoman Randolph and Honorable Board Members:

Marathon Petroleum Company LP (MPC) appreciates the opportunity to provide comments on CARB's Proposed Second 15-Day Changes to the Proposed Amendments to the LCFS.

MPC is a wholly owned subsidiary of Marathon Petroleum Corporation, a leading, integrated, downstream energy company headquartered in Findlay, Ohio. MPC is a supplier of fuels in the State of California and, both directly and through its subsidiaries, invests in low-carbon solutions to meet the energy demands of today and into the future. MPC's commitment to low-carbon solutions is reflected in the successful conversions of its Dickinson, North Dakota and Martinez¹, California petroleum refineries into renewable fuel production facilities. Combined, these two operating facilities are expected to produce up to 2.5 million gallons per day of renewable transportation fuel from renewable feedstock sources with an aggregate life-cycle carbon intensity that is approximately 60 percent less than petroleum-based fuels.

The proposed Second 15-Day changes outline CARB's intent to apply a penalty to biomass-based fuels that fail to meet the Sustainability Requirements for Biomass (Sustainability Requirements) in Section 95488.9(g) and clarifies the application of the credit limit for biomass-based diesel produced from soybean, canola, and sunflower oil. With this letter and opportunity to comment, MPC is providing recommendations that it believes are critical to ensure the LCFS maintains a market-based focus, provides a stable investment signal, and incentivizes new, low-carbon technology used in the transportation fuel sector.

MPC's recommendations on the Second 15-Day changes are listed below. Additional discussion and support for these recommendations are provided in the subsequent sections.

• MPC again recommends the proposed Sustainability Requirements in Section 95488.9(g) be delayed by at least two (2) years.

¹ Martinez Renewables LLC is a 50/50 joint venture between affiliates of Marathon Petroleum Corporation and Neste Corporation.

- MPC recommends CARB confirm the effective date for certified biomass-based diesel pathway holders under Section 95482(i).
- 167.1

The Sustainability Requirements CARB continues to propose will constrain the renewable fuel supply chain. Producers and suppliers of renewable fuels rely on this supply chain to deliver emission reductions within California's transportation sector.

As MPC stated in its comments^{2,3} to the First Proposed Amendments to the LCFS and the First 15-day Amendments to the LCFS, the Sustainability Requirements will introduce unnecessary financial and logistical burdens on the feedstock supply chain. While CARB has acknowledged in the Second 15-day changes that the Annual Fuel Pathway Reports (AFPR) for the Fuel Pathway Requirements⁴ of 2026 will be submitted in 2027, this clarification does not change the fact that renewable fuel producers will need to know whether farmers can provide the required information well before the beginning of the 2026 compliance year. The producer, not the farmer or the feedstock supplier, must attest to the veracity of the information supplied. Thus, producers will need to perform due diligence to ascertain that the geographical shapefiles or coordinates of plot boundaries align with the farmland from which crop-based feedstocks came and that the farmer followed all local, state and federal permits and laws. Producers, however, do not contract directly with farmers, so producers will have to work with the feedstock suppliers to obtain this information. Given the severe penalty for failing to have this information, producers will want to ensure that this information is available before feedstock is purchased.

Section 95488.8(g)(4) penalizes producers of renewable diesel and ethanol that fail to meet the Sustainability Requirements by assigning a carbon intensity (CI) equal to the CI of the fuel's petroleum counterpart, ULSD or CARBOB. Until the feedstock supply chain can provide the necessary information, producers may choose to reduce the risk of supplying deficit-generating biomass-based fuel by minimizing the volume of biomassbased fuel supplied in California. Demand for liquid fuels will remain in California, and any reductions to the biomass-based fuel supply will be supplemented with petroleum fuels. This is particularly troubling as ethanol is produced from crop-based feedstocks, and CARB gasoline cannot meet specifications without the use of ethanol.

As MPC highlighted in its comments to the July 7, 2022, LCFS workshop⁵, land use in the United States is tracked to ensure it stays below the 402 million acres aggregate baseline the RFS monitors to protect against adverse land use changes resulting from converting agricultural feedstocks into fuel. As shown in Figure 1, land use in the U.S. for agricultural feedstocks used to produce fuel has declined over time, minimizing the need for overly complex and punitive additions to the LCFS program such as the Sustainability Requirements.

- https://www.arb.ca.gov/lists/com-attach/7466-lcfs2024-VzoHcQFjAg5VMABv.pdf
- ⁴ Existing certified pathways as noted in §95488.9(g)(5)(A), (6)(A), (7)(A)

⁵ MPC comments to CARB's July 7, 2022, LCFS workshop. <u>https://www.arb.ca.gov/lists/com-attach/35-lcfs-wkshp-jul22-ws-WjcCdFU3V1sEYVU6.pdf</u>

² MPC comments to CARB's 45-day package.

https://www.arb.ca.gov/lists/com-attach/6890-lcfs2024-B2RXMFwvWWgKU1c7.pdf ³ MPC comments to CARB's 1st 15-day package.

Figure 1.



US ACREAGE PLANTED of ALL CROPS Since 07-08 (EISA)

Figure 1 produced and provided by <u>PRX</u>, utilizing data from the <u>USDA</u> and

For these reasons, MPC recommends that CARB delay the Fuel Pathway Requirements of 2026, 2028, and 2031 by two (2) years each to give the supply chain time to develop systems that ensure biomass-based fuel produced from crop-based feedstocks meet the Sustainability Requirements. At a minimum, MPC recommends CARB not apply a penalty to the 2026 criteria, as this would prevent any near-term unintended risk of the Sustainability Requirements reducing the amount of renewable diesel and ethanol supplied in California.

167.2 CARB's changes to Section 95482(i) help explain how CARB intends to apply a credit limit, but confirmation is needed with respect to the effective date for certified biomass-based diesel pathway holders.

MPC thanks CARB for the clarifications made in Section 95482(i) regarding the types of transactions to which the proposed credit limit may apply. However, the additional changes made in §95482(i) require further clarification, specifically the following statement:

"For companies which have submitted a biomass-based diesel pathway certification application under CA-GREET 3.0 or which have a certified biomass-based diesel pathway
167.2 Cont.

prior to the effective date of this regulation, this provision takes effect beginning January 1, 2028."

MPC understands these changes would allow companies with a biomass-based diesel pathway that is certified prior to the effective date of the amended LCFS regulation to obtain an updated or new certified biomass-based diesel pathway at the same facility without the credit limit applying to transactions associated with the updated or new pathway. A company may request an updated or new pathway to reflect process changes made at a facility (with a previously certified biomass-based diesel pathway) that reduce CI or enable the use of different alternative feedstock supplies, such as waste oils, animal fats, or other renewable biomass. MPC requests that CARB confirm a company with an existing certified biomass-based diesel pathway can apply for an updated or new pathway at the same facility without subjecting the updated or new pathway to the credit limit.

Thank you for the opportunity to comment on these subjects. If you have any questions about anything discussed here, feel free to reach out to me at <u>bcmcdonald@marathonpetroleum.com</u>.

Sincerely,

BAMZ

Brian McDonald Marathon Petroleum Company LP | West Coast Regulatory Affairs Advisor

Cc: Rajinder Sahota, Deputy Executive Officer, Climate Change and Research Matthew Botill, Division Chief, Industrial Strategies

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Comment 168 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Jeremy
Last Name	Martin
Email Address	jmartin@ucsusa.org
Affiliation	Union of Concerned Scientists
Subject	UCS Comments on LCFS October 15-day changes
Comment	
Attachment	www.arb.ca.gov/lists/com-attach/7809-lcfs2024- VTkAZ1RnV2FRIm0D.pdf
Original File Name	UCS Oct 15 day comments.pdf

Date and Time Comment Was 2024-10-16 13:30:42 **Submitted**

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Board Comments Home

[Concerned Scientists

To:	California Air Resources Board
From:	Jeremy Martin
Date:	October 16 th , 2024
Subject:	Comments on Low Carbon Fuel Standard October 15-day changes

Thank you for the opportunity to comment on this important regulation. While several useful changes were made to provisions governing transportation electrification in the October 15-day changes, the proposed changes pertaining to manure biomethane are a major step backwards and must be rejected. The 15-day changes also fail to strengthen the inadequate safeguards for crop-based fuels proposed in August, and instead weaken that proposal by delaying its implementation for more of the marketplace. These two changes must be remedied before the amendments are finalized.

- 168.1 Specifically, on biomethane we recommend removing the proposed changes to subsection 95488.9(f)(3) (A) and (B) that extend crediting periods for avoided methane and introduce a last-minute grandfathering provision for manure digester projects that break ground before 2030.
- 168.2 On renewable diesel, subsection 95482(i) should be revised as follows:

Biomass-based diesel, alternative jet fuel and renewable gasoline produced from soybean oil, canola oil, and sunflower oil is eligible for LCFS credits for up to twenty percent combined of total biomass-based diesel annual production reporting, by company, based on the following transaction types: production in California, produced for import, and import. Any reported quantities of biomass-based diesel, alternative jet fuel and renewable gasoline produced from soybean oil, canola oil, and sunflower oil in excess of twenty percent on a company-wide basis will be assigned the carbon intensity found in Table 7-1 of the LCFS regulation for ULSD in the case of bio-based diesel, FJF in the case of alternative jet fuel and CBOB in the case of renewable gasoline the carbon intensity. benchmark shown in Table 2 in Section 95484(e) for the applicable data reporting year, or the certified carbon intensity for the associated fuel pathway____whichever is greater. For companies with biomass-based diesel pathways certified prior to the effective date of the regulation and for which the percentage of biomass-based diesel produced from soybean oil or canola oil was greater than 20 percent of combined reported biodiesel and renewable diesel quantities for 2023 LCFS reporting, this provision takes effect beginning January 1, 2028.

In addition to making these urgent changes before finalizing this rulemaking package, there is additional work that must proceed in the months and years to come. More details on why these changes are necessary and on the work that must continue next year is below.

Biomethane

168.3 We strongly oppose the proposed changes to subsection 95488.9(f)(3) (A) and (B) that extend crediting periods for avoided methane and introduce a last-minute grandfathering provision for manure digester projects that break ground before 2030. The new language in both subsections should be rejected. The

168.3 changes to 95488.9(f)(3) (A) would extend crediting periods far longer than is economically justified, and Cont. constitutes an excessive subsidy for dairies paid for by drivers. The changes to 95488.9(f)(3) (B) preempt a forthcoming rulemaking and allow credits for avoided methane pollution to continue for decades after the underlying regulatory structure that justifies crediting avoided methane emissions has changed. The existing rules provide for one 10-year period, which is sufficient to provide regulatory certainty and cover the costs of the digester. It is time to phase it out and hold dairies responsible to mitigate their own pollution with the same support available to other LCFS pathways.

The recent analysis of Professor Aaron Smith makes it clear that "after the initial 10-year crediting period, there is little economic justification to continue these credits [for avoided methane emissions]"¹.

After the first 10 years, once capital costs have been paid, there is little economic justification for digesters to receive prevented methane LCFS credits. At current prices, credits from the RFS, plus the component of the LCFS credit stemming from fuel combustion, are more than sufficient to cover costs. This statement is particularly pertinent for the two thirds of digester credits generated outside the state. The federal program is providing enough to keep these digesters running; California drivers are effectively donating additional dollars.

One result of extending these subsidies will be that economic distortions caused by LCFS subsidies for digesters in milk and meat markets across the United States will persist until almost 2050, and in some cases longer. CARB has responded to this concern with the claim that there is not clear evidence that LCFS subsidies have already led to measurable changes in herd size at dairies with digesters. While we agree that LCFS subsidies are not the only factor responsible for dairy consolidation, extending these excessive subsidies after the capital costs of the digesters have been recouped would provide windfall profits that tilt the playing field in favor of the largest dairies. This is not necessary or justified to meet California's dairy methane reduction targets.

CARB initially justified these subsidies because California dairies were not otherwise required to mitigate their own methane pollution. As we have discussed in previous comments, it is essential that CARB initiates a rulemaking process outside of the LCFS to directly regulate dairy methane emissions as soon as possible. The last-minute addition of this consequential grandfathering provision in the LCFS amendment inappropriately preempts the discussion of how best to structure regulations on dairies by shielding a large number of potentially regulated parties from the impact of the regulation before that important regulatory process has even started. The grandfathering provision also locks in this lavish subsidy for many years after the technical justification has ended. This means that a substantial share of the credits issued by the LCFS will not reflect real emissions reductions based on up-to-date lifecycle analysis.

Using the LCFS to support digesters means that California drivers end up covering the costs of the subsidies for digesters, and not just in California but across the United States. Providing a single 10-year crediting period in which digester projects are credited with avoided methane emissions is already a generous approach, which covers the costs of investments required to comply with forthcoming regulations of dairies. After dairy regulations go into effect and the initial 10-year crediting period expires, dairies should be held accountable to mitigate their own pollution.

¹ <u>https://energyathaas.wordpress.com/2024/10/14/how-much-should-dairy-farms-get-paid-for-trapping-methane/</u>

168.3
Cont.Winding down the counterproductive treatment of avoided methane pollution in an orderly way will help
ensure that emissions benefits claimed by the LCFS are real and based on up-to-date lifecycle
assessments.

168.4 **Food-based fuels**

The proposal in the August 15-day changes to limit credit generation for vegetable oil-based diesel fuels to 20 percent of feedstock enforced on biofuel producers, while a step forward, is inadequate and poorly structured. We oppose the proposal in the October 15-day changes to exempt all current pathway holders from the limit until 2028. In our comments on the August 15-day changes we suggest several ways the present proposal could be made more effective with simple changes so that it could be implemented without delay. These include expanding coverage to all fuels including jet fuel, not just diesel, and changing the CI assigned to fuel over the 20 percent limit to ULSD in the case of diesel fuels and the appropriate fossil comparator in the case of jet fuel or gasoline. We still believe these changes are an appropriate short-term expedient to strengthen efficacy of the proposed safeguard. However, if the staff is developing a safeguard to implement starting in 2028, we suggest a more effective structure that caps the use of key feedstocks across the whole market.

Extend the 20 percent limit to all fuels (especially jet fuel)

As discussed extensively in our earlier comments, it is likely that by 2028 most if not all of the diesel fuel consumed in California will be bio-based diesel. The CATS model projects about 3.5 billion gallons of total diesel fuel consumption. If 20 percent of this total was produced from vegetable oil, it would require more than 2.5 million metric tons of vegetable oil as feedstock, a 60 percent increase over 2023.

A 60 percent increase in vegetable oil consumption by 2028 would already be a large and unsustainable increase, but it could end up being much larger because the limit on credit generation does not apply to jet fuel or gasoline. In 2022, California used as much jet fuel as diesel, and jet fuel use is expected to rise even as diesel use falls. The federal government is increasing policy support for bio-based jet fuel and many companies are announcing plans to produce bio-based jet fuel. It would be much better to send a clear market signal before bio-based jet fuel producers make investments to produce vegetable oil-based jet fuels rather than waiting until a problem arises.



168.5 *Apply the fossil USLD Carbon intensity to fuels over the 20 percent limit*

A second fatal flaw in the proposed safeguard is that it does not stop increased diversion of vegetable oil to fuel, it merely reduces its compliance value under the LCFS by a modest amount. When an obligated party sells vegetable oil-based renewable diesel instead of fossil diesel that fuel is directly and indirectly subsidized by 5 distinct mechanisms: LCFS credit generation; avoided LCFS deficit generation associated with the fossil diesel the renewable diesel replaces; avoided cap and trade allowances associated with the fossil diesel; RIN generation under the federal Renewable Fuel Standard; and federal tax credits. Eliminating LCFS credit generation will have a modest impact on the total value of these stacked subsidies, and thus may not provide an adequate disincentive to stop the increased use of vegetable oil-

168.5 Cont. based fuels. As shown in the figure below, as the LCFS diesel standard gets more stringent, LCFS credits become less important than avoided deficits. By 2028 more than half of the compliance value an obligated party receives from selling soy-based renewable diesel in place of fossil ultra-low sulfur diesel (ULSD) will come from avoided deficits associated with ULSD rather than direct credit generation for the renewable diesel. After 2030, credit generation falls rapidly, and disappears entirely by 2035, or even sooner if the auto-acceleration mechanism speeds up the compliance schedule.



If fuels above the 20 percent limit are assigned the CI of ULSD, the disincentive will be larger and will remain constant over time. This is a more significant and stable disincentive that will more effectively discourage the diversion of food to fuel.

168.6 Use the time before 2028 to fix LSCF credit tracking systems and software to allow for market-wide limits

If CARB intends to delay implementation for almost all relevant parties until 2028, it should use this time to implement a more effective and efficient safeguard. The proposed safeguard is inadequate because it does not prevent continued increases in the diversion of vegetable oil from food to fuel. Strengthening the proposal as described above would be an improvement, but adjusting the incentive for producers and hoping the market solves the problem is not adequately protective given the severe harm of increasing diversion of food to fuel and won't protect food consumers or stop deforestation. A more direct and effective safeguard is needed to guarantee that vegetable oil diversion stops increasing. CARB should transition as quickly as possible from a safeguard that adjusts CI scores to a market-wide limit on the quantity of vegetable oil used for any fuel.

A market-wide safeguard should remove all compliance value for vegetable oil feedstock use above the cap under California policy (including LCFS credits, avoided LCFS deficits, and reduced cap and trade allowances). In other words, fuels above the cap should be treated as equivalent to fossil diesel under all California policies. Implementing the cap across the market rather than on individual fuel producers will allow each biofuel producer flexibility to use the feedstocks they have access to, compete within the market-wide cap, and produce the fuels the market demands, whether that is diesel, jet fuel or gasoline.

Establishing a market-wide safeguard will require changes to the systems and software used to administer the LCFS. Specifically, CARB must tag LCFS credits indicating their origin/feedstock to enable sensible limits to be enforced on obligated parties use of credits associated with high-risk feedstocks to demonstrate LCFS compliance. CARB should make these changes promptly and once the systems are in

- 168.6 Cont. place it can replace the inadequate safeguards proposed in these amendments with safeguards that are more protective of the environment and food markets. This will address the current problems with excessive use of vegetable oil-based fuels but will also make the program stronger, more flexible and better able to respond to emerging future challenges.
- 168.7 While diversion of vegetable oil from food to fuel is the most pressing concern today, the rapidly increasing diversion of tallow and used cooking oil from existing markets around the world to California is also a concern. These resources are not wastes and will be backfilled in other markets with vegetable oil or other resources. Brazil and China are currently exporting a lot of these feedstocks to supply California but will need these resources over time to supply their own markets with low carbon fuels. California's climate policies are most impactful when they are transferable, which is not the case with the current rapid scaleup of tallow and used cooking oil imports to make fuels in California.

168.8

Also, while use of corn for ethanol has been stable in the last decade, without appropriate safeguards it could once again become a major problem in coming years. For the last decade, the E10 blend wall has constrained the amount of corn ethanol that is consumed in California. But a pending approval of E15 and scale up of ethanol-based jet fuel could lead to a harmful surge in the use of corn-based fuel. The poorly designed safeguard proposed in the case of bio-based diesel fuels would not transfer readily to concerns about corn, since ethanol producers generally do not have access to alternative feedstocks. Rather than waiting until a problem emerges and then taking years to design and implement a workable safeguard, it would be better for all market participants if California made it clear in advance that it will not allow damaging surges in diversion of food to fuel. Setting a ceiling on food used for fuels before a crisis occurs will send a clear market signal and allow fuel producers and obligated parties flexibility to adjust their strategies within the guardrails. A market-wide cap on the use of corn for fuel would allow E15 and ethanol-based jet fuel to grow gradually and offset declining use of ethanol in E10. This transition could be guided by the market while still providing an assurance that a boom in the use of corn-based fuels does not become a disruptive crisis like the recent renewable diesel boom.

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Comment 169 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Orran
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Affiliation	
Subject	Leadership Counsel for Justice and Accountability Comments on 2nd Notice of Availability
Comment	Attached please find comments submitted by the offices of Shute, Mihaly & Weinberger LLP on behalf of the Leadership Counsel for Justice and Accountability Regarding the Second Notice of Availability of Proposed Modifications to the LCFS.
Attachment	www.arb.ca.gov/lists/com-attach/7829-lcfs2024-ADJQYVdkBDpGYM0D.pdf
Original File Name	Leadership Counsel et. al. Comments on the Second Additional Modification to the Proposed Amendments to the Low Carbon Fuel Standard(1837160.4).pdf
Date and Time Comment Was Submitted	2024-10-16 14:40:28

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

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October 16, 2024

Via Electronic Submittal

Clerk of the Board California Air Resources Board 1001 I. Street Sacramento, CA 95814

Re: <u>Comments on the Second Additional Modifications to the Proposed</u> <u>Amendments to the Low Carbon Fuel Standard</u>

Dear Honorable Members of the California Air Resources Board:

This firm represents Leadership Counsel for Justice and Accountability ("Leadership Counsel") in matters relating to the California Air Resources Board's ("CARB") Proposed Amendments to the Low Carbon Fuel Standard Regulation ("LCFS"). Central Valley Defenders of Clean Water & Air, Animal Legal Defense Fund, and Food & Water Watch have informed us that they also join in this letter. We previously submitted multiple sets of comments explaining that the Proposed Amendments greatly increase the incentivize that large dairies with liquid manure handling systems ("factory farms") have to expand their herd sizes and install anaerobic digesters. Both the original Draft Environmental Impact Analysis ("DEIA") and the Recirculated Draft Environmental Impact Analysis ("Recirculated DEIA") omitted *any* analysis of the environmental impacts of herd expansion and included an insufficient, cursory analysis of the impacts associated with digesters.

Instead of supplementing its deficient environmental analysis, CARB issued a second set of modifications¹ that provide an even greater incentive than the previous versions of the Proposed Amendments to expand herd sizes and install anaerobic digesters at factory farms. Most significantly, the second set of modifications provide that the rule limiting avoided methane crediting if there is a law, regulation, or mandate

169.1

¹ California Air Resources Board, Second Notice of Public Availability of Modified Text and Availability of Additional Documents and/or Information (October 1, 2024) ("Second Additional Modifications").

Clerk of the Board October 16, 2024 Page 2

169.1 Cont.

169.2

requiring methane reductions only applies to pathways that break ground after December 31, 2029.² Additionally, the second set: (1) requires hydrogen dispensed as a vehicle fuel to be at least 80 percent "renewable" by 2030, which includes hydrogen produced using fossil gas as a feedstock if biomethane attributes are matched to the production;³ (2) reverts to CARB's original proposal to allow three, ten-year avoided methane crediting periods for pathways certified before the effective date of the regulation;⁴ and (3) allows book-and-claim for biomethane used to produce electricity for electric vehicle charging if the electricity is generated using a fuel cell.⁵

CARB contends that "no additional environmental analysis or recirculation of the EIA is required."⁶ CARB is wrong. CEQA requires lead agencies to recirculate an environmental impact report when the agency makes changes to the project that substantially increase the severity of an environmental impact previously considered or a new significant environmental impact would result from the project. Pub. Res. Code § 21092.1; 14 Cal. Code Regs. § 15088.5; *Laurel Heights Improvement Ass'n v. Regents of Univ. of Cal.* (1993) 6 Cal.4th 1112, 1130; *Western Placer Citizens for an Agricultural & Rural Environment v. County of Placer* (2006) 144 Cal.App.4th 890, 899-903.

Each of the additional modifications discussed herein send a clear, stronger signal than prior iterations of the proposed regulation to factory farms to increase their herd sizes and install anaerobic digesters in the near-term to take advantage of the lucrative benefits provided by the LCFS, many of which will no longer be available if pathways are certified too late.⁷ The greater incentive to expand herds and install digesters will undoubtedly increase the severity of the significant and unavoidable air quality, water quality, greenhouse gas, and public health impacts that CARB acknowledges, and those that it does not. CARB must recirculate the DEIA and conduct a comprehensive analysis of the environmental impacts caused by the substantial increase in herd expansion and anaerobic digesters, particularly in the Central Valley communities that already bear a substantial pollution burden.

² *Id.* at 8-9 (subsection 95488.9(f)(3)(B)).

³ *Id.* at 3 (section 95482(h)).

⁴ *Id.* at 8 (subsection 95488.9(f)(3)(A)).

⁵ *Id.* at 8 (subsection 95488.8(i)(2)).

⁶ *Id*. at 10.

⁷ Also concerning are proposals the add a new temporary carbon intensity for electricity produced by fuel cell from dairy and swine manure and update the temporary fuel pathway for hydrogen produced from biomethane. *Id.* at 8.

Clerk of the Board October 16, 2024 Page 3

Very truly yours,

SHUTE, MIHALY & WEINBERGER LLP

Abala

Orran G. Balagopalan, Attorney



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Comment 170 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Kent
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Affiliation	
Subject	Mainspring Energy Comments on Proposed LCFS Amendments (2nd 15-Day Changes)
Comment	Please see the attached comment letter.
Attachment	www.arb.ca.gov/lists/com-attach/7841-lcfs2024- Uj5SMQFIWwtWMM0d.pdf
Original File Name	CARB LCFS Letter_Mainspring_Final (002).pdf
Date and Time Comment Was Submitted	2024-10-16 15:03:28

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Board Comments Home

Mainspring Energy 3601 Haven Avenue Menlo Park, CA 94025 mainspringenergy.com



October 16, 2024

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

Re: Proposed Amendments to the Low Carbon Fuel Standard (2nd 15-Day Changes)

Mainspring Energy, Inc. ("Mainspring") appreciates the opportunity to submit comments to the California Air Resources Board ("CARB") on the Proposed Amendments to the Low Carbon Fuel Standard (2nd 15-Day changes) released October 1, 2024. We strongly support the goals of the Low Carbon Fuel Standard (LCFS) and look forward to working with staff on guidance to ensure a level playing field for renewable electrical generation technologies, such as linear generators and fuel cells, as eligible for book-and-claim accounting of biomethane for electricity for electric vehicle charging.

170.1 We respectfully request the Resolution to adopt the Proposed Amendments to LCFS clarifies "fuel cell" within the following two subsections to include other renewable electrical generation technologies, such as linear generators. Similar to fuel cells, linear generators utilize a non-combustion reaction to convert biomethane into electricity with near-zero NOx emissions at levels well below CARB's distributed generation standard at all loads -- including during start-up.

The key provisions of concern added in the most recent 15-day changes include:

- 95488.8(i)(2) "staff proposes to allow for book-and-claim accounting of biomethane to produce electricity for electric vehicle charging, provided the electricity is generated using <u>a fuel cell."</u>
- 95488.9(b), "staff proposes to add a new temporary CI for low-CI electricity produced <u>by</u> (<u>fuel cell from biomethane from dairy and swine manure, based on existing program data.</u>")

Governor Newsom recently signed <u>AB 1921</u>, which includes linear generators using renewable fuels as a "renewable electrical generation facility," as eligible for the California Renewables Portfolio

Standard Program and other state programs. This legislation maintains technology neutrality and provides a level playing field for fuel cells and linear generators. Linear generators offer the same capability as fuel cells to produce electricity from biomethane for electric vehicle charging.

Mainspring is a leading California-headquartered developer and manufacturer of linear generators, which deliver local power that is dispatchable and renewable fuel-flexible. Mainspring's linear generator offers a unique non-combustion capacity and energy solution that simultaneously addresses the critical need of reducing greenhouse gas and criteria pollutant emissions, while also enhancing grid reliability and resilience.

Modular and scalable, Mainspring's linear generators can be deployed near load, either customeror grid-sited, with the ability to immediately generate electricity from a range of renewable fuels. Mainspring's inverter-based technology offers a full range of valuable grid benefits including fast (and unlimited daily) starts/stops, a wide dispatch range from minimum to maximum load, quick ramping, and, as necessary, on-site fuel storage. These capabilities allow linear generators to provide biogas producers with the flexibility needed for their complex and variable operations. Similarly, linear generators provide flexibility to end use customers such as Prologis Mobility and Maersk, which use linear generators coupled with battery energy storage to charge all-electric heavy duty drayage trucks, thereby eliminating local air pollution for the surrounding disadvantaged communities.

Linear generators are playing an important role in advancing California's zero emission vehicle goals and are carrying out the goals of the Low Carbon Fuel Standard Program and state's carbon reduction targets. As noted above, linear generators are already being used for EV charging of trucks serving the Ports of LA and Long Beach, and additional linear generator projects are planned to provide zero-emission electricity for large logistics operations statewide.

We respectfully request the clarification that "fuel cells" in these two subsections also include "linear generators" or "renewable electrical generation facility" and/or CARB's Resolution to adopt (the Proposed Amendments to LCFS clarifies "fuel cell" to include other renewable electrical (generation technologies, such as linear generators, to maintain technology neutrality and ensure a (level playing field.)

Without this clarification, the LCFS program will disproportionately benefit one renewable energy generation technology (fuel cells) at the detriment to others (linear generators). The uncertainty regarding the most recent and last-minute changes are already hindering linear generators projects

and disadvantaging a California technology that Governor Newsom, just days ago, defined as a "renewable electrical generation facility" to explicitly recognize linear generators as offering the same capability as fuel cells to produce electricity from biomethane for electric vehicle charging.

We strongly urge clarifying language to ensure a fair and equitable approach to achieve the goals of the LCFS program and the state's carbon reduction targets.

Sincerely,

Atta P.

Adam Simpson Chief Commercial Officer and Founder Mainspring Energy

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Comment 171 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Rana
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Email Address	justin.currie@international.gc.ca
Affiliation	Government of Canada
Subject	Canada's Comments on Proposed Changes to Low Carbon Fuel Standards (biofuels)

Comment

Copied and pasted from the attachment. Comment blocking starts on page 6.

The Honorable Liane M. Randolph, Chair California Air Resources Board 1001 I Street Sacramento, CA 95814 Re: Proposed Amendments to the California Low Carbon Fuel Standar Dear Chair Randolph, Canada appreciates the opportunity to submit the following commen[.] on the proposed amendments to the California Low Carbon Fuel Standard (LCFS). Canada is writing today to express concerns with the proposed amendments as they relate to oilseed feedstocks. Canada and California share a longstanding and strong agricultura. trading relationship, with bilateral trade in 2023 totaling USD \$ billion. California exported USD \$4.9 billion to Canada in 2023, making Canada the state's top agriculture and agri-food export market. One of Canada's top exports to California is canola oil, with California importing USD \$525 million worth of Canadian cano. oil in 2023, a portion of which would have been used for biofuel production. In 2023, 15% of Canada's canola oil was exported to California and represented 95% of all canola imported to the state of California. Similarly, Canada is one of the top exporter of soybeans seeds into California, a portion of which may be process further into biomass-based diesel production. Like California, Canada recognizes the valuable opportunities to reduce the lifecycle greenhouse gas emissions of biofuels, including by adopting climate smart agricultural practices. Canada supports harnessing innovative solutions that encourage and reward the adoption of sustainable practices by producers while pursuing our shared sustainability objectives. Clean fuels create jobs, suppor rural communities and provide opportunities for a more sustainable future.

Canada supports the production and use of low-carbon fuels, including agricultural biofuels, through the Canadian Clean Fuel Regulations (CFR). The Land Use and Biodiversity (LUB) criteria a incorporated into the CFR to ensure the sustainability of biofuel feedstocks and prevent adverse land use and biodiversity impacts related to cultivation and harvesting. This LUB Criteria recognize the strong sustainability record of Canadian and U.S. farmers. Under the CFR, Canadian and U.S. agricultural feedstocks are deeme compliant with Land Use and Biodiversity criteria, through Legislative Recognition and recognition of the US EPA aggregate compliance approach. The LUB criteria set requirements that must | met for participation in the CFR. The LUB criteria aim to reduce cost and administrative burden for farmers and the agricultural supply chain

by leveraging existing mechanisms and regulations within respectiv jurisdictions through Legislative Recognition and aggregate compliance. Canada believes that the LUB criteria sufficiently meets the sustainability objectives that California's proposed amendments would require.

Canada is concerned with California's proposed amendments to limicredit creation for canola, soybean, and sunflower oilseeds to twenty percent of total biomass-based diesel annual production pe company. The twenty percent limit being proposed appears to be arbitrary and duplicative of carbon intensity scoring, especially due to the lack of transparent, science-based justification or da⁻ supporting these limitations. Likewise, the choice of canola, soybean, and sunflower oilseeds appears contrary to the significan amount of data globally that highlights the critical role of oilseed feedstocks in reducing emissions.

To ensure reliable and stable trade, Canada supports policy development that is transparent, science-based, recognizes the highly integrated nature of the North American agricultural secto reduces administrative burden on our supply chains and minimizes trade disruptions. Due to the size and scale of the California market, limiting feedstocks in California biofuel production could have unforeseen impacts on North American's supply chain and markets. Canadian oilseeds are exported to California for further processing and value-added use, creating and sustaining high payi jobs that contribute to the implementation of California's energy policy objectives. Canada is concerned that without the recognition of national approaches (e.g. Canada's Clean Fuel Regulations or t U.S. Renewable Fuel Standard), California's amendments will create a disruptive sub national patchwork of regulations that would negatively impact the biofuel market and undermine our shared commitment to sustainability. To avoid potential economic impacts from misalignment and to ensure continued growth, it is important that California promote ongoing collaboration, coordination, and consistency with internationally recognized standards and their close trading partners such as Canada.

To avoid inadvertently minimizing the effectiveness of the biofue sector, Canada suggests that California consider the two followin LCFS amendments:

Remove the twenty percent limitations on biomass-based diesel produced from soybean, canola, and sunflower oil. Reduce administrative burden and support the recognition of Canadian oilseed in compliance with the CFR LUB criteria that is consistent with California's proposed sustainability certification requirement. Should California proceed with certification requirements on oilseeds, Canada would appreciate additional guidance on implementation to assist in streamlining the requirements, especially as it relates to the biomass input geographic shapefiles and coordinates of plot boundaries. To discuss this important issue, Canada would like to request a meeting with Chair Randolph prior to the final approval of the proposed amendments to the LCFS. Canada thanks California for the opportunity to submit comments a looks forward to further information sharing, collaboration, and coordination on this important topic. Should you have any questions, please contact Holly.McCoubrey@agr.gc.ca Sincerely, -----Michelle Cooper Director General Market Access Secretariat Agriculture and Agri-Food Canada _____ Rana Sarkar Consul General of Canada Head of Mission Canadian Consulate of San Francisco

Attachment www.arb.ca.gov/lists/com-attach/7848-lcfs2024-BWZdOVdkUGoAZM0d.pdf

OriginalCanada Comments on Proposed Changes to Low Carbon Fuel StandardsFile NameOctober 16 2024.pdf

Date and 2024-10-16 16:01:14 Time Comment Was Submitted

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Board Comments Home



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

Re: Proposed Amendments to the California Low Carbon Fuel Standard

Dear Chair Randolph,

Canada appreciates the opportunity to submit the following comments on the proposed amendments to the California Low Carbon Fuel Standard (LCFS). Canada is writing today to express concerns with the proposed amendments as they relate to oilseed feedstocks.

Canada and California share a longstanding and strong agricultural trading relationship, with bilateral trade in 2023 totaling USD \$9 billion. California exported USD \$4.9 billion to Canada in 2023, making Canada the state's top agriculture and agri-food export market. One of Canada's top exports to California is canola oil, with California importing USD \$525 million worth of Canadian canola oil in 2023, a portion of which would have been used for biofuel production. In 2023, 15% of Canada's canola oil was exported to California and represented 95% of all canola imported to the state of California. Similarly, Canada is one of the top exporter of soybeans seeds into California, a portion of which may be processed further into biomass-based diesel production.

Like California, Canada recognizes the valuable opportunities to reduce the lifecycle greenhouse gas emissions of biofuels, including by adopting climate smart agricultural practices. Canada supports harnessing innovative solutions that encourage and reward the adoption of sustainable practices by producers while pursuing our shared sustainability objectives. Clean fuels create jobs, support rural communities and provide opportunities for a more sustainable future.

Canada supports the production and use of low-carbon fuels, including agricultural biofuels, through the Canadian Clean Fuel Regulations (CFR). The Land Use and Biodiversity (LUB) criteria are incorporated into the CFR to ensure the sustainability of biofuel feedstocks and prevent adverse land use and biodiversity impacts related to cultivation and harvesting. This LUB Criteria recognizes the strong sustainability record of Canadian and U.S. farmers. Under the CFR, Canadian and U.S. agricultural feedstocks are deemed compliant with Land Use and Biodiversity criteria, through Legislative Recognition and recognition of the US EPA aggregate compliance approach. The LUB criteria aim to reduce cost and administrative burden for farmers and the agricultural supply chain

Canadä



by leveraging existing mechanisms and regulations within respective jurisdictions through Legislative Recognition and aggregate compliance. Canada believes that the LUB criteria sufficiently meets the sustainability objectives that California's proposed amendments would require.

171.1 Canada is concerned with California's proposed amendments to limit credit creation for canola, soybean, and sunflower oilseeds to twenty percent of total biomass-based diesel annual production per company. The twenty percent limit being proposed appears to be arbitrary and duplicative of carbon intensity scoring, especially due to the lack of transparent, science-based justification or data supporting these limitations. Likewise, the choice of canola, soybean, and sunflower oilseeds appears contrary to the significant amount of data globally that highlights the critical role of oilseed feedstocks in reducing emissions.

> To ensure reliable and stable trade, Canada supports policy development that is transparent, science-based, recognizes the highly integrated nature of the North American agricultural sector, reduces administrative burden on our supply chains and minimizes trade disruptions. Due to the size and scale of the California market, limiting feedstocks in California biofuel production could have unforeseen impacts on North American's supply chain and markets. Canadian oilseeds are exported to California for further processing and value-added use, creating and sustaining high paying jobs that contribute to the implementation of California's energy policy objectives. Canada is concerned that without the recognition of national approaches (e.g. Canada's Clean Fuel Regulations or the U.S. Renewable Fuel Standard), California's amendments will create a disruptive sub national patchwork of regulations that would negatively impact the biofuel market and undermine our shared commitment to sustainability. To avoid potential economic impacts from misalignment and to ensure continued growth, it is important that California promote ongoing collaboration, coordination, and consistency with internationally recognized standards and their close trading partners such as Canada.

> To avoid inadvertently minimizing the effectiveness of the biofuel sector, Canada suggests that California consider the two following LCFS amendments:

- Remove the twenty percent limitations on biomass-based diesel produced from soybean, canola, and sunflower oil.
- Reduce administrative burden and support the recognition of Canadian oilseed in compliance with the CFR LUB criteria that is consistent with California's proposed sustainability certification requirement.

Should California proceed with certification requirements on oilseeds, Canada would appreciate additional guidance on implementation to assist in streamlining the

Canadä

171.2



requirements, especially as it relates to the biomass input geographic shapefiles and coordinates of plot boundaries.

To discuss this important issue, Canada would like to request a meeting with Chair Randolph prior to the final approval of the proposed amendments to the LCFS.

Canada thanks California for the opportunity to submit comments and looks forward to further information sharing, collaboration, and coordination on this important topic.

Should you have any questions, please contact Holly.McCoubrey@agr.gc.ca

Sincerely,



Michelle Cooper Director General Market Access Secretariat Agriculture and Agri-Food Canada



Rana Sarkar Consul General of Canada Head of Mission Canadian Consulate of San Francisco

Canadä

Comment Log Display

Here is the comment you selected to display.

Comment 172 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Cassandra	
Last Name	Farrant	
Email Address	cfarrant@ampamericas.com	
Affiliation	Amp Americas	
Subject	Comments on the Second Proposed Low Carbon Fuel Standard Amendments	
Comment	Amp America appreciates the opportunity to submit comments in response to the second proposed Low Carbon Fuel Standard Amendments. Please see our comments attached.	
Attachment	www.arb.ca.gov/lists/com-attach/7900-lcfs2024-VTkAY1YIA2QCKM0D.pdf	
Original File Name	Amp Second Proposed LCFS 15-Day Admendments Comment Letter.pdf	
Date and Time Comment Was Submitted	2024-10-16 17:35:03	

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Board Comments Home



October 16, 2024

Rajinder Sahota California Air Resources Board 1001 | Street Sacramento, CA 95814

RE: AMP AMERICAS COMMENTS ON THE SECOND PROPOSED 15-DAY CHANGES TO THE PROPOSED AMENDMENTS TO THE LOW CARBON FUEL STANDARD REGULATION

Dear Ms. Sahota:

Thank you for the opportunity to comment on the Second Proposed 15-Day Changes to the Proposed Amendments to the Low Carbon Fuel Standard ("LCFS"). Amp Americas ("Amp") appreciates the California Air Resource Board's ("CARB's") leadership on addressing climate change, and especially appreciates CARB staff's thorough and ongoing stakeholder engagement throughout the LCFS amendment process.

We strongly support the LCFS program, which has been critical in advancing a wide array of climate and environmental priorities for California, including reducing methane from dairies, as CARB has documented in various workshops throughout the amendment process and most recently with the August 22, 2024, Dairy Sector Workshop. As we have shared in previous comment letters, **we are concerned that the proposed amendments move away from the technology-neutral, science- and performance-based framework that has made the LCFS so successful**. We hope to work with CARB and stakeholders during future rulemakings to return the program to its technology neutral roots and ensure it remains a durable driver of investment in the clean fuels projects that California needs to meet its goals.

Still, the most important thing is that the Board approve amendments at the November 8, 2024, Board Meeting and CARB timely finalizes the regulatory package, so that program amendments can take effect as soon as possible, including the proposed step down in Q1 2025. We look forward to continuing to work with CARB through implementation guidance and future rulemakings to address the issues below and ensure the LCFS remains a model climate policy that can underpin California's climate efforts and provide a model for other jurisdictions to follow.

ABOUT AMP

Founded in 2011, Amp develops, owns, and operates renewable natural gas ("RNG") facilities that convert dairy waste into renewable energy. Over our history, Amp's projects have prevented over 2 million 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 technology-neutral, performance-based policy framework that has made the LCFS so unique and successful.

172.1 AVOIDED METHANE CREDITING IS CRITICAL TO ACHIEVING CALIFORNIA'S CLIMATE GOALS

As detailed in our comments responding to the November 9, 2022, workshop,¹ dairy biogas projects are low cost in terms of greenhouse gas reductions, but high cost in terms of energy production. Based on cost curve estimates from UC Davis,² and updating for inflation, market progress to date, and additional cost drivers not included in their analysis, we estimated at the time that the cost required to increase dairy RNG production in California from the current location on the supply curve would have been \$121 per MMBtu. Today, after two years for high inflation and some continued progress up the supply curve, those costs have only increased. It is impractical to expect that energy markets alone will support continued investment in these dairy RNG projects at these prices.

Therefore, in order to sustain investment in these projects and progress toward California's statutory methane reduction goals, the greenhouse gas reductions (that is, avoided methane) from these projects need to be accounted for and valued. That's why the LCFS has succeeded in scaling dairy digester and RNG development, when other approaches have not—lifecycle accounting under the LCFS explicitly values avoided methane emissions, supporting low-cost climate mitigation where energy-only markets cannot.

Continuing avoided methane crediting under the LCFS is absolutely critical to maintaining the viability of existing projects, and development of new ones. Dairy digester projects cost tens to hundreds of millions of dollars and take 2-3 years to develop and construct. Avoided methane crediting provides the source of revenue for these projects that pays for their beneficial impact and allows developers to invest. If in the future, farm methane emissions are regulated directly, milk buyers will foot the bill for reducing emissions through milk prices or government will directly subsidize digesters. But until then, avoided methane crediting is the only proven way to support the development, ongoing operations, and associated emissions reductions that dairy digesters provide.³

172.2 CARB SHOULD CLARIFY THAT DAIRY AND SWINE MANURE AND ORGANIC WASTE DIVERTED FROM LANDFILL DISPOSAL PROJECTS UNDER DEVELOPMENT ARE ELIGIBLE FOR THREE CREDITING PERIODS FOR AVOIDED METHANE

While we oppose any arbitrary sunsetting of avoided methane crediting, especially before alternative mechanisms are in place to achieve similar climate benefits, we appreciate staff's ongoing efforts to strike a balance among stakeholder perspectives in the proposed amendments. In particular, we appreciate clarification in the Second 15-Day Changes that the change from three to two avoided

¹ https://www.arb.ca.gov/lists/com-attach/125-lcfs-wkshp-nov22-ws-VzZcN1EgAg5QOghr.pdf

² https://steps.ucdavis.edu/wp-content/uploads/2017/05/2016-UCD-ITS-RR-16-20.pdf

³ https://onlinelibrary.wiley.com/doi/10.1111/gcbb.13101



172.2 methane crediting periods does not apply to existing projects, which aligns with clarifications we Cont. requested in response to the First 15-Day Changes and the principle that new rule changes shouldn't apply retroactively, especially in cases where those changes would upend the economics of projects already under development. Retroactive regulation will set a dangerous precedent that will chill appetite for investment broadly under the LCFS and other regulatory programs in support of state goals.

But there remains an important caveat worth clarifying – Amp had requested clarification that the proposed change in avoided methane crediting would not apply to existing projects *or those under development*.⁴ Existing projects and those under development both were financed and developed based on the expectation of receiving three crediting periods, and CARB should avoid amendments that retroactively affect projects and investments previously made.

The impact could be significant. Amp alone has hundreds of millions of dollars of projects under development that have yet to receive a pathway certification, but which were financed under the expectation of receiving three crediting periods for avoided methane. These projects alone are expected to deliver annual emissions reductions of about 250,000 MTCO₂e. Across the industry, we expect the impact could be about ten times greater, likely reaching projects and investments totaling billions of dollars and millions of MTCO₂e of annual emissions reductions. Many of these projects have submitted pathway applications to CARB that have been pending for well over a year, with unknown dates for when they'll be formally approved.

Both existing projects, as well as those under development, should receive a safe harbor from regulatory changes that will affect the market moving forward. We hope that CARB can clarify this through the Resolution, guidance or other means.

ADDITIONAL COMMENTS ON SECOND 15-DAY CHANGES

172.3 In addition to the proposed amendments to avoided methane crediting, we have consistently opposed changes to book-and-claim accounting, which are arbitrary and singularly designed to disadvantage biomethane compared to other alternative fuels and even fossil-based natural gas, which is almost entirely imported into California from elsewhere in North America. We continue to oppose limitations on book-and-claim access for biomethane projects, and we hope to work through future rulemakings to ensure that biomethane has access to the California market, regardless of its origin in the United States. Still, while we are opposed to the proposed deliverability requirements, we appreciate that the second 15-Day changes provide additional clarity on the program requirements and respond to concerns that other stakeholders and we have expressed regarding the previous proposal and uncertainty around potential approval of a gas system map. Nonetheless, we are concerned by the proposal to tie dates for deliverability requirements to targeted levels of zero emission Class 3-8 vehicles.

172.4 We have also consistently advocated for enabling book-and-claim access for biomethane-to-electricity projects, which would only add value and resiliency to the electric vehicle charging ecosystem in California. We appreciate that the Second 15-Day changes now allow for biomethane-to-electricity projects, but we are perplexed why this pathway is limited to use in a fuel cell. This requirement is

⁴ <u>https://www.arb.ca.gov/lists/com-attach/7547-lcfs2024-UDFcN1YnWFQLfVcl.pdf</u>



172.4 another example of arbitrary restrictions that limit market opportunities for biomethane and do not exist for other fuels under the program.

If nothing else, linear generators should be an eligible technology, as well, as they are similarly a clean, distributed resource, just like fuel cells. In fact, the legislature just unanimously passed, and the Governor signed, AB 1921, which makes linear generators using renewable fuels eligible under the Renewable Portfolio Standard, just as fuel cells are today. CARB should follow suit and allow broader access under the biomethane-to-electricity provisions for at least linear generators, and preferably all electric generation technologies.

- While we support the 9% step down, we remain concerned, that combined with the 2030 target, targets over the remainder of this decade are insufficient to drive continued growth in the low carbon fuels
 market. The regulation appears to rely on the Auto Acceleration Mechanism ("AAM"), which we strongly support, to drive additional investment and progress in the low carbon fuels market. We appreciate the amendments in the Second 15-Day changes to move from annual to quarterly review, which will allow the tool to be more flexible to market conditions. This is a necessary change, since the 2030 target under the program is clearly out of alignment with State's emission goals under the 2022 Scoping Plan, and achieving the state's climate change targets may rely on the AAM triggering multiple times before 2030.
- 172.7 Finally, we reiterate our support for the proposed true-up mechanism and request that CARB allow adjustments as needed, and at a minimum, quarterly, to the margin of safety ("MOS") that a pathway may apply as operational data becomes available. This will allow a pathway holder to adjust a CI proactively to prevent a CI exceedance. We also request that an MOS be allowed for temporary CIs.

SUMMARY

Overall, we applaud CARB for this thorough process and developing proposed amendments that will make the LCFS stronger than it is today, and we strongly encourage the Board to adopt the regulatory proposal on November 8. Unfortunately, the amendments seem limited in their climate ambition, scaling back the program and potential emissions benefits by imposing arbitrary limitations on a number of fuels, including dairy biomethane, and setting targets that do not align with the state's climate goals. We look forward to continuing to work with CARB and stakeholders on implementation of this program and through future amendments, including to address the following:

- Protect conditions and provisions necessary to enable ongoing investment in projects to reduce potent methane emissions from the dairy sector until a new program is in place that can deliver similar environmental benefits.
- Clarify that dairy projects developed under the previous rules, and specifically both existing projects, as well as those under development, should receive a safe harbor from regulatory changes.
- Expand book-and-claim access for biomethane-to-electricity pathways to all electricity generation technologies, and if nothing else, linear generators.
- Allow adjustments, at least quarterly, to the margin of safety applied to a pathway, including temporary carbon intensities.



Thank you again for your collaboration with stakeholders through this public process and the opportunity to comment on the proposed Second 15-Day Changes. In addition to the comments above, Amp endorses comments submitted by the Coalition for Renewable Natural Gas and Generate Capital. We appreciate your consideration of these comments and all the work put into this rulemaking process by CARB staff, leadership, and the Board.

Sincerely,

Cassandra Farrant

Cassandra Farrant Head of Environmental Credit Compliance Amp Americas

Comment Log Display

Here is the comment you selected to display.

Comment 173 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Nina
Last Name	Robertson
Email Address	nrobertson@earthjustice.org
Affiliation	
Subject	Comments of Earthjustice, CBD, APEN and CBD
Comment	
Attachment	www.arb.ca.gov/lists/com-attach/7922-lcfs2024- USNWOlxvA2EDNm0D.pdf
Original File Name	Second_15-day_Comment_Letter-Final-Earthjustice CBE APEN CBD.pdf
Date and Time Comment Was Submitted	2024-10-16 19:09:17

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Board Comments Home







October 16, 2024

Members of Board California Air Resources Board 1001 I Street Sacramento, CA 95814

Via Electronic Submittal

RE: Earthjustice, Communities for a Better Environment, Asian Pacific Environmental Network, and Center for Biological Diversity Comments on the Low Carbon Fuel Standard Second 15-Day Changes.

Chair Randolph and Members of the California Air Resources Board:

The LCFS Proposal headed to the Board in November presents a set of changes more aligned with prolonging harmful industry practices than with the urgent needs of environmental justice, climate action, and California's air quality and carbon neutrality goals. We respectfully request that the Board reject these revisions and adopt a program aligned with climate and air quality needs. It is unfortunate that some of the most critical feedback from frontline communities, environmental groups, and climate advocates is absent from the LCFS Proposal. In fact, the revisions double down on policies that entrench polluting practices and delay critical reforms.

Because the LCFS Proposal largely ignores the hundreds of pages of comments provided and rejects suggestions for necessary program improvements, we fail to see the value in providing detailed responses to the numerous flaws in CARB's second 15-day changes to the Proposed Amendments. Thus, this comment letter focuses on several of the most alarming aspects of the proposed changes, including their continued reliance on problematic biofuels and biomethane, the bias toward dirty hydrogen at the expense of clean, the weakening of equity provisions that support a just transition off of climate-harming combustion fuels, and its inconsistency with air quality standards.

173.1

Ι. The LCFS Proposal Doubles Down on Harmful Biofuel Feedstocks.

Rather than taking the necessary steps to implement an effective and science-based approach to limiting virgin oil feedstocks, CARB's latest changes to the Proposed Amendments entrench their use. The Proposal lacks meaningful long-term deterrents to runaway virgin oils used as a biofuel feedstock. Specifically, it fails to assign the fossil diesel carbon intensity score to fuels above the 20% crop-feedstock restriction, provides an even more generous grandfathering provision that delays implementation of the restriction until 2028, and fails to cover Sustainable 173.1 Aviation Fuel. While CARB's addition of sunflower oil to the 20% limit further acknowledges

Cont. the issues posed by virgin oils, it fails to address the broader concern of interchangeability among these oils, particularly the absence of restrictions on other high-impact feedstocks like corn oil. This omission highlights a critical gap in policy, as virgin oils can be easily substituted, undermining the intended environmental protections. Taken together, Proposal's biofuels provisions reward environmentally damaging agricultural practices, drive up food prices, and create a perverse incentive to expand forest clearing.

The LCFS should not be designed to effectively pave the way for more deforestation, global hunger, and indeed higher greenhouse gas emissions.

173.2

II. The LCFS Proposal Expands Lavish and Unjustified Incentives for Biomethane at the Expense of Environmental Justice.

Despite longstanding calls to regulate emissions from industrial dairy and swine operations, and the plain text of Senate Bill 1383 which requires CARB to do so, CARB has continued to expand lavish incentives for these projects. By offering up to three 10-year crediting periods, CARB is locking California into decades of reliance on harmful methane production practices. Worse still, the LCFS proposes to allow projects to continue to receive new avoided methane crediting periods even if methane capture and reduction requirements are implemented under SB 1383, turning what was a stop-gap solution to the dairy methane problem into an ongoing windfall from the LCFS. CARB further proposes greenwashing the electricity used for electric vehicle charging by allowing book-and-claimed biomethane attributes for this purpose.

CARB is operating under the assumption that methane emitters require LCFS subsidies in the form of avoided methane credits to build and operate dairy digesters. CARB provides no analysis to support this assumption, and a recent independent analysis shows it is wrong. According to a UC Berkeley review of industry digester cost data and existing subsidies, "[a]fter the first 10 years [of avoided methane crediting], once capital costs have been paid, there is little economic justification for digesters to receive prevented methane LCFS credits."¹ This is because the federal Renewable Fuels Program "is providing enough to keep these digesters running." As a result, "California drivers are effectively donating additional dollars" to digester companies, and sending most of those dollars out of state, as roughly two-thirds of LCFS dairy biomethane is from outside of California.² Why is CARB ignoring this evidence and guaranteeing decades of windfall profits to methane emitters at the expense of Californians?

With each turn on this issue, the Proposal has ignored calls from not only affected community members and advocates but also its own Board Members to actuate effective policies that do not incentivize further consolidation and gift polluters with extravagant incentives rather than treating the emissions on par with other methane-emitting sources. CARB should shift the LCFS from a program predicated on factory farms being paid for their pollution to a program requiring

¹ Smith, Aaron. How Much Should Dairy Farms Get Paid for Trapping Methane? (Oct. 14, 2024), <u>https://energyathaas.wordpress.com/2024/10/14/how-much-should-dairy-farms-get-paid-for-trapping-methane/</u> (emphasis added).

 $^{^{2}}$ *Id.* (emphasis added).

- that they clean up their own mess—the same approach that is taken for wastewater, landfills, andcont.even oil and gas operations.
- Further, CARB doubles down on treating out-of-state dairy emissions favorably by not immediately requiring the gas to be delivered to California, unlike all other fuels in LCFS. As explained above, this means that the LCFS is sending a large portion of its revenues out of state, thereby undermining California's ability meet its short-lived climate pollutant reduction goals and other climate goals. Under the Proposal's weak deliverability provision, CARB does not require deliverability to California until 2041 for compressed natural gas ("CNG") and until 2046 for methane used to make hydrogen. CARB only moves up this requirement to 2038 if an arbitrary heavy-duty truck threshold is met. Worse, this 2038 provision only applies to dairy methane used as a final fuel (i.e., CNG)—which is already being phased out of California's transportation systems—and not for hydrogen. Why is the agency delaying for close to two decades requirements that are necessary now? As we face climate disaster after climate disaster, we do not have the luxury to wait two decades for this commonsense provision.

III. The LCFS Proposal Supports Dirty, Greenwashed Hydrogen Over Green Hydrogen.

- 173.4 For numerous reasons, the Proposal's treatment of hydrogen is thwarting a just transition off fossil fuels. First, the definition of "renewable hydrogen" in the Proposal and the accompanying notice of availability are misleading because CARB does not explain that the definition of "<u>renewable hydrogen</u>" includes hydrogen derived from reformation of <u>fossil methane</u> paired with book-and-claim biomethane credits. CARB allows this dirty hydrogen to be called "renewable" even though its production emits harmful pollutants and has dubious climate benefits.
- 173.5 Second, CARB's allowance of book-and-claim accounting for fossil gas-derived hydrogen will lock in dirty hydrogen production for decades to come and kneecap growth of truly green hydrogen in California. With biomethane receiving the excessively lavish subsidies described above, its unbundled environmental attributes will be readily available to greenwash dirty hydrogen under the Proposed Amendments. Supercharging more dirty hydrogen production in California means more pollution in already overburdened communities.
- 173.6 Third, because deliverability of biomethane paired with hydrogen is not required until 2046 (explained above), dirty hydrogen producers in California will paper over their polluting fuel with out-of-state credits for at least the next 22 years.
- 173.7 Fourth, CARB is now allowing the fossil fuel-derived hydrogen that is not paired with biomethane credits to remain in the program until 2035, undermining both the State's carbon neutrality goals and its commitments to clean air. By delaying the phase out of fossil gas-derived hydrogen, CARB is kicking the can down the road on one of the most critical energy issues of our time and handing industry yet another undeserved gift at the expense of our climate and communities.
- 173.8 Fifth, the provision allowing three-quarter book-and-claim crediting of low-carbon intensity electricity for electrolytic hydrogen and direct air capture projects—which will likely result in

- ^{173.8} increased greenhouse gas emissions—has been further weakened. CARB has walked back the
- Cont. limitation to electrolytic hydrogen and is now proposing to allow book-and-claim provisions for all types of hydrogen, including hydrogen that uses fossil methane as a feedstock.

In sum, the Proposal is ensuring the proliferation of stranded fossil fuel assets in California instead of driving a transition to genuinely clean hydrogen sources, and it is misleading the public by allowing hydrogen derived from fossil fuels to be called "renewable." This lack of

support for green hydrogen undermines environmental justice and raises questions about California's climate leadership and its commitment to becoming a clean hydrogen hub.

173.9 IV. Base Credit and Equity Provisions: Watered Down Commitments

Several organizations have consistently asked CARB to ensure that the LCFS prioritizes funding for the communities most harmed by fossil fuel pollution. Unfortunately, rather than strengthening these commitments, the LCFS Proposal weakens them. The revisions allow less equity spending for most utility funds and keeps the first 15-day Proposal provisions crediting Original Equipment Manufacturers rather than funding additional medium- and heavy-duty zeroemission vehicles ("ZEVs"). These funds are California's best and most reliable funding source to support a just transition, yet CARB seems to favor funding multi-billion-dollar companies that are already required to transition to ZEVs rather than helping those most in need.

173.10

V. The LCFS Will Continue to Be Dominated by Combustible Fuels, Which Will Impede Attainment of Air Quality Standards.

An additional frustration is that the LCFS Proposal is untethered from air quality planning. The program will continue to be dominated by combustible fuels despite air plans saying we must shift to zero-emissions everywhere feasible by this year for the 1997 8-hour ozone standard, 2031 for the 2008 8-hour ozone standard, and 2037 for the 2015 8-hour ozone standard. In fact, CARB's action to withdraw the South Coast's Section 185 Contingency Measure Plan for the 1997 8-hour ozone standard—which included a commitment to actually achieve additional Nitrogen Oxide (NOx) reductions from the LCFS—signals the complete separation of its climate efforts from air quality planning. By abandoning shifts to make the LCFS program consistent with air quality needs to get to zero-emissions, CARB continues its legacy of not doing what is necessary to actually attain air quality standards.

Conclusion

The LCFS Proposal prioritizes industry rapacious appetite for billions of dollars of lavish incentives over science, environmental justice, and the health of California's residents. We urge the Board to reject these deeply flawed provisions and take meaningful steps to realign the LCFS with the State's climate, air quality, and equity goals. We understand this will require additional work by staff to fix this deeply broken program, and we do not take this suggestion lightly. But, the current proposal locks in decades of harms that will be hard to unwind without Board leadership to stop it now.

Sincerely,
Matt Vespa Nina Robertson Adrian Martinez Earthjustice

Lauren Gallagher Communities for a Better Environment

Faraz Rizvi Asia Pacific Environmental Network

Shaye Wolf Center for Biological Diversity

Here is the comment you selected to display.

Comment 173 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Nina
Last Name	Robertson
Email Address	nrobertson@earthjustice.org
Affiliation	
Subject	Comments of Earthjustice, CBD, APEN and CBD
Comment	
Attachment	www.arb.ca.gov/lists/com-attach/7922-lcfs2024- USNWOlxvA2EDNm0D.pdf
Original File Name	Second_15-day_Comment_Letter-Final-Earthjustice CBE APEN CBD.pdf
Date and Time Comment Was Submitted	2024-10-16 19:09:17

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.







October 16, 2024

Members of Board California Air Resources Board 1001 I Street Sacramento, CA 95814

Via Electronic Submittal

RE: Earthjustice, Communities for a Better Environment, Asian Pacific Environmental Network, and Center for Biological Diversity Comments on the Low Carbon Fuel Standard Second 15-Day Changes.

Chair Randolph and Members of the California Air Resources Board:

The LCFS Proposal headed to the Board in November presents a set of changes more aligned with prolonging harmful industry practices than with the urgent needs of environmental justice, climate action, and California's air quality and carbon neutrality goals. We respectfully request that the Board reject these revisions and adopt a program aligned with climate and air quality needs. It is unfortunate that some of the most critical feedback from frontline communities, environmental groups, and climate advocates is absent from the LCFS Proposal. In fact, the revisions double down on policies that entrench polluting practices and delay critical reforms.

Because the LCFS Proposal largely ignores the hundreds of pages of comments provided and rejects suggestions for necessary program improvements, we fail to see the value in providing detailed responses to the numerous flaws in CARB's second 15-day changes to the Proposed Amendments. Thus, this comment letter focuses on several of the most alarming aspects of the proposed changes, including their continued reliance on problematic biofuels and biomethane, the bias toward dirty hydrogen at the expense of clean, the weakening of equity provisions that support a just transition off of climate-harming combustion fuels, and its inconsistency with air quality standards.

173.1

Ι. The LCFS Proposal Doubles Down on Harmful Biofuel Feedstocks.

Rather than taking the necessary steps to implement an effective and science-based approach to limiting virgin oil feedstocks, CARB's latest changes to the Proposed Amendments entrench their use. The Proposal lacks meaningful long-term deterrents to runaway virgin oils used as a biofuel feedstock. Specifically, it fails to assign the fossil diesel carbon intensity score to fuels above the 20% crop-feedstock restriction, provides an even more generous grandfathering provision that delays implementation of the restriction until 2028, and fails to cover Sustainable 173.1 Aviation Fuel. While CARB's addition of sunflower oil to the 20% limit further acknowledges

Cont. the issues posed by virgin oils, it fails to address the broader concern of interchangeability among these oils, particularly the absence of restrictions on other high-impact feedstocks like corn oil. This omission highlights a critical gap in policy, as virgin oils can be easily substituted, undermining the intended environmental protections. Taken together, Proposal's biofuels provisions reward environmentally damaging agricultural practices, drive up food prices, and create a perverse incentive to expand forest clearing.

The LCFS should not be designed to effectively pave the way for more deforestation, global hunger, and indeed higher greenhouse gas emissions.

173.2

II. The LCFS Proposal Expands Lavish and Unjustified Incentives for Biomethane at the Expense of Environmental Justice.

Despite longstanding calls to regulate emissions from industrial dairy and swine operations, and the plain text of Senate Bill 1383 which requires CARB to do so, CARB has continued to expand lavish incentives for these projects. By offering up to three 10-year crediting periods, CARB is locking California into decades of reliance on harmful methane production practices. Worse still, the LCFS proposes to allow projects to continue to receive new avoided methane crediting periods even if methane capture and reduction requirements are implemented under SB 1383, turning what was a stop-gap solution to the dairy methane problem into an ongoing windfall from the LCFS. CARB further proposes greenwashing the electricity used for electric vehicle charging by allowing book-and-claimed biomethane attributes for this purpose.

CARB is operating under the assumption that methane emitters require LCFS subsidies in the form of avoided methane credits to build and operate dairy digesters. CARB provides no analysis to support this assumption, and a recent independent analysis shows it is wrong. According to a UC Berkeley review of industry digester cost data and existing subsidies, "[a]fter the first 10 years [of avoided methane crediting], once capital costs have been paid, there is little economic justification for digesters to receive prevented methane LCFS credits."¹ This is because the federal Renewable Fuels Program "is providing enough to keep these digesters running." As a result, "California drivers are effectively donating additional dollars" to digester companies, and sending most of those dollars out of state, as roughly two-thirds of LCFS dairy biomethane is from outside of California.² Why is CARB ignoring this evidence and guaranteeing decades of windfall profits to methane emitters at the expense of Californians?

With each turn on this issue, the Proposal has ignored calls from not only affected community members and advocates but also its own Board Members to actuate effective policies that do not incentivize further consolidation and gift polluters with extravagant incentives rather than treating the emissions on par with other methane-emitting sources. CARB should shift the LCFS from a program predicated on factory farms being paid for their pollution to a program requiring

¹ Smith, Aaron. How Much Should Dairy Farms Get Paid for Trapping Methane? (Oct. 14, 2024), <u>https://energyathaas.wordpress.com/2024/10/14/how-much-should-dairy-farms-get-paid-for-trapping-methane/</u> (emphasis added).

 $^{^{2}}$ *Id.* (emphasis added).

- that they clean up their own mess—the same approach that is taken for wastewater, landfills, andcont.even oil and gas operations.
- Further, CARB doubles down on treating out-of-state dairy emissions favorably by not immediately requiring the gas to be delivered to California, unlike all other fuels in LCFS. As explained above, this means that the LCFS is sending a large portion of its revenues out of state, thereby undermining California's ability meet its short-lived climate pollutant reduction goals and other climate goals. Under the Proposal's weak deliverability provision, CARB does not require deliverability to California until 2041 for compressed natural gas ("CNG") and until 2046 for methane used to make hydrogen. CARB only moves up this requirement to 2038 if an arbitrary heavy-duty truck threshold is met. Worse, this 2038 provision only applies to dairy methane used as a final fuel (i.e., CNG)—which is already being phased out of California's transportation systems—and not for hydrogen. Why is the agency delaying for close to two decades requirements that are necessary now? As we face climate disaster after climate disaster, we do not have the luxury to wait two decades for this commonsense provision.

III. The LCFS Proposal Supports Dirty, Greenwashed Hydrogen Over Green Hydrogen.

- 173.4 For numerous reasons, the Proposal's treatment of hydrogen is thwarting a just transition off fossil fuels. First, the definition of "renewable hydrogen" in the Proposal and the accompanying notice of availability are misleading because CARB does not explain that the definition of "<u>renewable hydrogen</u>" includes hydrogen derived from reformation of <u>fossil methane</u> paired with book-and-claim biomethane credits. CARB allows this dirty hydrogen to be called "renewable" even though its production emits harmful pollutants and has dubious climate benefits.
- 173.5 Second, CARB's allowance of book-and-claim accounting for fossil gas-derived hydrogen will lock in dirty hydrogen production for decades to come and kneecap growth of truly green hydrogen in California. With biomethane receiving the excessively lavish subsidies described above, its unbundled environmental attributes will be readily available to greenwash dirty hydrogen under the Proposed Amendments. Supercharging more dirty hydrogen production in California means more pollution in already overburdened communities.
- 173.6 Third, because deliverability of biomethane paired with hydrogen is not required until 2046 (explained above), dirty hydrogen producers in California will paper over their polluting fuel with out-of-state credits for at least the next 22 years.
- 173.7 Fourth, CARB is now allowing the fossil fuel-derived hydrogen that is not paired with biomethane credits to remain in the program until 2035, undermining both the State's carbon neutrality goals and its commitments to clean air. By delaying the phase out of fossil gas-derived hydrogen, CARB is kicking the can down the road on one of the most critical energy issues of our time and handing industry yet another undeserved gift at the expense of our climate and communities.
- 173.8 Fifth, the provision allowing three-quarter book-and-claim crediting of low-carbon intensity electricity for electrolytic hydrogen and direct air capture projects—which will likely result in

173.8 increased greenhouse gas emissions—has been further weakened. CARB has walked back the limitation to electrolytic hydrogen and is now proposing to allow book-and-claim provisions for all types of hydrogen, including hydrogen that uses fossil methane as a feedstock.

In sum, the Proposal is ensuring the proliferation of stranded fossil fuel assets in California instead of driving a transition to genuinely clean hydrogen sources, and it is misleading the public by allowing hydrogen derived from fossil fuels to be called "renewable." This lack of support for green hydrogen undermines environmental justice and raises questions about California's climate leadership and its commitment to becoming a clean hydrogen hub.

173.9 IV. Base Credit and Equity Provisions: Watered Down Commitments

Several organizations have consistently asked CARB to ensure that the LCFS prioritizes funding for the communities most harmed by fossil fuel pollution. Unfortunately, rather than strengthening these commitments, the LCFS Proposal weakens them. The revisions allow less equity spending for most utility funds and keeps the first 15-day Proposal provisions crediting Original Equipment Manufacturers rather than funding additional medium- and heavy-duty zeroemission vehicles ("ZEVs"). These funds are California's best and most reliable funding source to support a just transition, yet CARB seems to favor funding multi-billion-dollar companies that are already required to transition to ZEVs rather than helping those most in need.

173.10

V. The LCFS Will Continue to Be Dominated by Combustible Fuels, Which Will Impede Attainment of Air Quality Standards.

An additional frustration is that the LCFS Proposal is untethered from air quality planning. The program will continue to be dominated by combustible fuels despite air plans saying we must shift to zero-emissions everywhere feasible by this year for the 1997 8-hour ozone standard, 2031 for the 2008 8-hour ozone standard, and 2037 for the 2015 8-hour ozone standard. In fact, CARB's action to withdraw the South Coast's Section 185 Contingency Measure Plan for the 1997 8-hour ozone standard—which included a commitment to actually achieve additional Nitrogen Oxide (NOx) reductions from the LCFS—signals the complete separation of its climate efforts from air quality planning. By abandoning shifts to make the LCFS program consistent with air quality needs to get to zero-emissions, CARB continues its legacy of not doing what is necessary to actually attain air quality standards.

Conclusion

The LCFS Proposal prioritizes industry rapacious appetite for billions of dollars of lavish incentives over science, environmental justice, and the health of California's residents. We urge the Board to reject these deeply flawed provisions and take meaningful steps to realign the LCFS with the State's climate, air quality, and equity goals. We understand this will require additional work by staff to fix this deeply broken program, and we do not take this suggestion lightly. But, the current proposal locks in decades of harms that will be hard to unwind without Board leadership to stop it now.

Sincerely,

Matt Vespa Nina Robertson Adrian Martinez Earthjustice

Lauren Gallagher Communities for a Better Environment

Faraz Rizvi Asia Pacific Environmental Network

Shaye Wolf Center for Biological Diversity

Here is the comment you selected to display.

Comment 174 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Francis "Terry"
	Last Name	Molloy
	Email Address	ftmolloy66@hotmail.com
	Affiliation	
	Subject	Gas Prices
174.1	Comment	The continued lack of empathy in regards to the continued taxation on gasoline is phenomenal. You are crushing us with artificial increases and it bring the State to a grinding economic halt.

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 19:03:24

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 175 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	James
	Last Name	Collins
	Email Address	jic2068@gmail.com
	Affiliation	
	Subject	Gasoline tax
175.1	Comment	I feel this is like a double edged sword. Larger tax should reduce consumption but obviously increase costs. If we all drive less this helps improve air quality and increased taxes SHOULD be used to benefit road conditions.

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-11 19:10:37

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 176 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Ron
Last Name	Мау
Email Address	rdmay32252@gmail.com
Affiliation	
Subject	Another gas tax? YIKES
Comment	The governor of CA is not in touch with the citizens of this state! I'm happy he can afford essentials, but many cannot! We already pay the highest taxes and have endured terrible inflation. Please consider repeal of the last gas tax and prevent further taxes! Seniors and many others are suffering!

Attachment

176.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 21:26:31

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 177 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Bill
Last Name	Hayden
Email Address	pbhome@cox.net
Affiliation	
Subject	Gas tax
Comment	The state doesn't have budget problem, just a spending problem. You can just keep adding taxes to our fuel cost, this will hurt the lower income and retirees.

Attachment

177.1

Original File Name

Date and Time Comment Was Submitted 2024-10-11 21:57:13

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 178 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	JOHN
	Last Name	HAYWOOD
	Email Address	jackhaywood@hotmail.com
	Affiliation	
	Subject	Increase in Gasoline tax
178.1	Comment	I am retired on a fixed income and the proposed increase in tax would cause financial hardship for me. Please don't increase the gas tax. Thank you

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-12 11:25:05

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 179 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	wes
	Last Name	Morgan
	Email Address	wes-morgan@sbcglobal.net
	Affiliation	
	Subject	CARB legislation
179.1	Comment	I am against the carbon reduction proposal that will increase gas prices by as much as 65 cents per gallon. Please remove this from any future action.

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-12 12:07:33

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Here is the comment you selected to display.

Comment 180 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

	First Name	Lynne
	Last Name	Morgan
	Email Address	lynne.c.morgan@sbcglobal.net
	Affiliation	
	Subject	CARB legislation
180.1	Comment	I am against the carbon reduction proposal that will increase gas prices by as much as 65 cents per gallon. Please remove this from any future action.

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-12 12:07:33

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.



CleanFuture, Inc. P.O. Box 23813 Portland, OR 97281-3813 office: +1 503 427-1968 e-mail: john@CleanFuture.us

October 16, 2024

Liane M. Randolph Chair, California Air Resources Board

(Comment submitted electronically)

RE: CleanFuture's Comments on the Low Carbon Fuel Standard Proposal

Dear Chair Randolph:

181.1

CleanFuture appreciates the opportunity to provide written comments on the Proposed Amendments to the Low Carbon Fuel Standard ("LCFS") Regulation, as reflected by the second 15-day rulemaking package released on October 1, 2024 (the "LCFS Proposal"). CleanFuture broadly supports the California Air Resources Board's ("CARB's") LCFS Proposal. CleanFuture particularly appreciates and supports the acceleration of the rate of carbon intensity ("CI") reductions, the extension of the CI reduction tables to 2045, and the continued expansion of electrification crediting.

181.2 This comment letter ("Comment") is focused solely on the provision that CARB has included in the LCFS Proposal via the language contained in §95488.10(b) that is typically referred to as the "True-Up Provision." From CleanFuture's unique vantage point, the further refinement of the True-Up Provision is a critically important factor in both ensuring the fundamental fairness of the overall LCFS program and in supporting the commercialization of novel technologies including the conversion of biogas to electricity. The implementation of these types of innovative technologies is essential toward achieving the LCFS goal of the CI of California's transportation fuel. However, the True-Up Provision as contained in the LCFS Proposal, does not fully support this central LCFS objective.

CleanFuture is an industry leading company connecting clean vehicle fleet customers with low CI fuels, serving both on the supply and demand side in California's LCFS, Oregon's Clean Fuels Program ("CFP"), Washington's Clean Fuels Standard ("CFS"), and other emerging clean fuel standards. CleanFuture is a designated credit generator and aggregator for hundreds of fleets and thousands of vehicle units for these state CFS programs. CleanFuture provides full-service low carbon consulting to its clients including fleet efficiency; low carbon fuel utilization; clean vehicles and vehicle technologies; and monetization strategies. CleanFuture has worked for over a decade to improve the efficiency of a wide range of vehicle fleets. CleanFuture is the leading supplier of renewable electricity from biogas as a transportation fuel to heavy-duty EVs in California's LCFS and Oregon's CFP. We also serve as a third-party aggregator and supply funding to fleets to incentivize and advance heavy-duty vehicle



electrification and charging stations, while improving economics for biogas to renewable energy projects.

The operative language of the True-U Provision is as follows¹:

§ 95488.10. Maintaining Fuel Pathways.

(...)

(b) Credit True Up after Annual Verification. Beginning with the 2025 annual Fuel Pathway Report data reporting year, the Executive Officer may perform credit true up for a fuel pathway, including a temporary pathway used by an entity that subsequently receives fuel pathway certification for the associated production facility, that has a lower verified operational CI upon receiving a positive or qualified positive verification statement for the associated annual fuel pathway report and guarterly fuel transactions reports, notwithstanding the prohibition on retroactive credit generation in section 95486(a)(2). To implement this true up, the Executive Officer will calculate an equivalent number of credits representing the difference between the reported CI and the verified operational CI from annual Fuel Pathway Reports for each fuel pathway code reported with non-liquid transaction types and with the following liquid fuel transaction types "Production in California," "Production for Import," and "Import" during a compliance year, and place those credits in the account of each appropriate fuel reporting entity after August 31 for the prior compliance year. Only reporting guarters for which complete operational data are reported in the applicable AFPR are eligible for credit true up of a temporary fuel pathway.

The credits will be calculated according to the following equation:

 $Credits_{CI \ difference}^{FPC} (MT)$ = $(Credits_{verified \ opertional \ CI}^{FPC} (MT) - Credits_{reported \ CI}^{FPC} (MT))$

 $\underline{lf}_{Credits_{CI \ difference}^{FPC} > 0}$

where:

Credits^{FPC}_{Cl difference} is the number of credits representing the difference between the reported Cl and verified operational Cl for each fuel pathway code;

 $Credits_{verified operational CI}^{FPC}$ is the number of credits calculated using $CI_{verified operational}^{XD}$ in the equation in section 95486.1(a)(1). $CI_{verified operational}^{XD}$ is determined by the Executive Officer on the basis of the annual Fuel Pathway Report submitted pursuant to section 95488.10 for each fuel pathway code; and

 $Credits_{reported Cl}^{FPC}$ is the number of credits calculated using equation in section 95486.1(a)(1) for each fuel pathway code.

(...)

¹ This version shows in marked-up format all proposed changes made to the current LCFS regulation during the LCFS rulemaking process as reflected in Attachment A-1.2 referenced in the Notice as "Proposed Second 15-Day Modifications to Proposed Regulation Order (First and Second 15-Day Modifications and 45-Day Modifications combined and compared to existing regulatory text) in Alternative format as released with the second 15-day package and available at https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/2nd_15day_atta_1.2.docx



The fundamental goal of the True-Up Provision was to address a recurring problem that CARB's ten years of experience in administering the LCFS program had revealed: for the lowest CI fuels that can deliver the greatest climate benefits through the avoidance of fugitive methane emissions, there is the highest degree of variability in terms of facility performance. Even without fault or negligence on behalf of the people who design and run these facilities, there can be exceedances of a pathway CI score that cannot be identified until months after the variability occurred and may not be precisely determined until the conclusion of the verification in August of the following year. It is for this critical reason that the True-Up Provision was proposed.

On its face, it appears that the LCFS Proposal resolves this problematic issue promptly with the language, "Beginning with the 2025 annual Fuel Pathway Report data reporting year, the Executive Officer may perform credit true up for a fuel pathway (...)." However, CleanFuture has had detailed communications with CARB staff in the last several weeks that have revealed that effective implementation of the True-Up Provision is years away.

In particular, CleanFuture has sought CARB staff assistance to make a modification to an existing pathway to align the CI score with facility performance. CARB staff has advised that the reference in the LCFS Proposal is to the Annual Fuel Pathway Report ("AFPR") <u>for the</u> <u>operational year of 2025 containing data from 2024-2025</u>. AFPRs for the operational year of 2025 are not due until the end of first quarter 2026, and are not verified until August of 2026. This time delay creates a three-year period of the True-Up Provision being rendered ineffectual. Specifically, the performance of fuel pathways for calendar year 2023 has only just been determined based on the verifications that just completed in August of 2025. August of 2025 and the performance of fuel pathways for calendar year 2025 may not be completed until August of 2025 and the performance of fuel pathways for calendar year 2025 may not be completed until August of 2026. Thus there exists a three-year period during which the LCFS Proposal will not effectuate the central purpose of the True-Up Provision: to create a prescribed method for reconciling CI exceedances.

To avoid this delay in the effective implementation of the critically important True-Up Provision, CleanFuture would recommend this slight modification to the language contained in the LCFS Proposal:

(b) *Credit True Up after Annual Verification*. Beginning with the in 2025 annual Fuel Pathway Report data reporting year, the Executive Officer may perform credit true up for a fuel pathway, including a temporary pathway used by an entity that subsequently receives fuel pathway certification for the associated production facility, that has a lower verified operational CI upon receiving a positive or qualified positive verification statement for the associated annual fuel pathway report and quarterly fuel transactions reports, notwithstanding the prohibition on retroactive credit generation in section 95486(a)(2).

(...)

181.3



Thank you for your consideration of these comments. Please advise if any further input on these issues would be constructive.

Sincerely, Jul A. Short

John A. Thornton, President CleanFuture, Inc.

Jim Duffy

From:	Ramalingam, Jordan@ARB <jordan.ramalingam@arb.ca.gov></jordan.ramalingam@arb.ca.gov>
Sent:	Wednesday, October 16, 2024 11:31 AM
То:	Jim Duffy
Cc:	Botill, Matthew@ARB; Monroe, Gabriel@ARB
Subject:	RE: How to interpret the proposed text in section 95484

Hi Jim,

Given the market nature of the program, I can't clarify that just for you. Please put your comments/questions into the docket so we can respond in the FSOR for everyone to see. Thank you, Jordan

From: Jim Duffy <duffje@msn.com>
Sent: Wednesday, October 16, 2024 2:10 AM
To: Botill, Matthew@ARB <Matthew.Botill@arb.ca.gov>; Ramalingam, Jordan@ARB <Jordan.Ramalingam@arb.ca.gov>; Monroe, Gabriel@ARB <Gabriel.Monroe@arb.ca.gov>
Subject: How to interpret the proposed text in section 95484

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 Matt, Jordan, and Gabriel,

182.1 I am confused by the regulation text for the AAM in section 95484. Depending on how you squint at it, it appears as if the text can be interpreted in two very different ways. I'm hoping that you can quickly inform me as to the actual intent, so that I can write my comments appropriately.

So here is a hypothetical: The AAM gets triggered for the first time and announced on August 15, 2030. Does the first acceleration occur on January 1, 2031? Or does the first acceleration occur on January 1, 2032?

The reason that I ask is that sections 95484(c) and 95484(d) could be interpreted as saying two very different things. For a trigger announced on August 15, 2030:

- Section 95484(c) seems to imply that on May 15, 2031 the updated benchmark schedule will be announced with the intent that this updated schedule will then supposedly go into effect on January 1, 2032. This interpretation seems to be consistent with your statement in the Notice about providing "earlier notice to stakeholders that the AAM has been triggered, providing further market certainty and lead time to LCFS participants."
- 2. However, sections 95484(c)(2) and 95484(d) also clearly read that the acceleration will take effect on January 1, 2031. Section 95484(c)(2) reads that the "updated benchmark schedule posted pursuant to 95484(c)(1) will override any prior benchmark schedules and will take effect January 1 of the calendar year after the Automatic Acceleration Mechanism was triggered." Since the AAM was triggered on August 15, 2030, this means the acceleration will occur on January 1, 2031. Section 95484(d) also reads that the benchmark "will be advanced by one year each time the Automatic Acceleration Mechanism has been triggered pursuant to section 95484(b)." This means that the benchmark for 2031 will be advanced by one year based on a trigger that is announced on August 15, 2030. This interpretation is not consistent with your stated objective of providing earlier notice to stakeholders but is a clear reading of the text. It also

doesn't make sense that you would wait until May 15, 2031 to announce an updated benchmark schedule that has already gone into effect on January 1, 2031.

So, please let me know which interpretation was intended so that I can appropriately focus my comments.

Best, Jim Duffy October 16, 2024

183.2

Liane Randolph, Chair Members of the Board California Air Resources Board 1001 I Street Sacramento, CA 95814

Dear Chair Randolph and Members of the Board,

Well, what can I say without sounding too cynical? The 2nd 15-day Notice is very disappointing. At the September 12 CARB-EJAC meeting, several Board Members clearly stated that they are concerned about crediting for crop-based biofuels and RNG projects. Board Members expressed a desire to see a more rigorous cap on lipid biofuels than staff proposed in the 1st 15-day Notice and a reevaluation of the duration of avoided methane crediting and deliverability requirements for RNG projects. CARB staff not only ignored this direction, but also reversed course by:

- giving all biomass-based diesel producers three years to comply with the already very weak limits on crop-based biofuels, and by
 - shielding digester projects from a potential future regulation by guaranteeing 30 years of avoided methane credit for currently certified projects and 20 years for future projects that break ground prior to 2030.
- 183.3 It is disappointing to see staff siding with the liquid biofuel, RNG, and fossil fuel industry over warnings from the environmental and academic communities and concerns expressed by Board Members.
- 183.4 Moreover, staff continue to ignore <u>warnings</u> about the potential for future costs. Whether staff and some Board Members want to admit it or not, Pandora's box has been opened and the curse of pass-through costs has been released. Both the public and the legislature are rapidly coming up to speed on the potential for future costs from both the LCFS and the Cap-and-Trade programs. During the recent special session on gasoline prices, the legislature discussed freezing the LCFS targets and by October 11 more than 100 comments had been submitted to the LCFS docket by Californians) complaining about the "65 cents per gallon LCFS tax". If they already don't like what they are hearing about the potential for gasoline price increases, what do you think their response will be when these costs come to fruition? What do you think their reaction will be when the cost of gasoline in California increases from \$1 over the national average to more than \$2 over the national average? And imagine what their response will be upon further learning that a good portion of the added cost is the result of CARB support for:
- Crop-based biofuels that may not reduce GHG emissions compared to gasoline and diesel, do not statistically reduce criteria pollutant emissions in new technology diesel engines, and very likely lead to tropical deforestation and increased hunger amongst the most food insecure populations of the world,
- Dairies that capture their own methane pollution and "deliver" it to California, even after staff have been informed by <u>UC economist</u> Aaron Smith and stakeholders (see)

183.6		page 9 of 45-day comments) using data provided by the dairy industry that "after the
Cont.		first 10 years, once capital costs have been paid, there is little economic justification
		for digesters to receive prevented methane LCFS credits",
183 7	٠	Very liberal book-and-claim accounting requirements that allow dairies in lowa and
100.7		swine feedlots in Missouri to "deliver" RNG to California even though this results in
		hundreds of millions (and potentially billions) of dollars leaving the State annually for
		avoided methane reductions that do not count toward California's statutory GHG
		reduction targets,
183.8	•	Very liberal book-and-claim accounting requirements that allow landfills in New York
		and Pennsylvania to "deliver" captured methane to California, even though the
		landfills were already capturing the methane prior to the LCFS adoption and would
		be sufficiently compensated by federal programs (without the LCFS) for delivering
		the fuel to NG vehicles in their own states,
183.9	•	Direct air capture projects in Texas that will likely result in hundreds of millions (and
		potentially billions) of dollars leaving the State annually for emission reductions that
		will not count toward California's statutory GHG reduction targets, and
183.10	•	Solar electricity projects in oil fields that are cost effective without the LCFS and
		"efficiency improvement" projects at petroleum refineries that were being planned
		even before the LCFS was adopted.

- If I were a venture capitalist or fuel producer evaluating whether to invest in some of the 183.11 projects described above, the current public uproar and reaction from some legislators (even democrats) over gasoline price impacts would make me pause to consider whether an investment with a payback of more than a few years is advisable. Will the legislature terminate the LCFS or freeze targets if pass-through costs from the LCFS and Cap-and-Trade get out of hand? Will a future governor step in and tell CARB to amend the regulation to get control over ever-increasing gasoline costs? Biofuel, RNG and fossil fuel stakeholders have successfully convinced staff to largely leave credit generation unmodified. They have done this by arguing that major changes to the regulation or limits on credit generation will inject significant uncertainty into the market and potentially strand assets. I argue that by not making strategic changes to the program to limit pass-through costs, by not cutting out unnecessary and ineffective credit generation, by not making changes necessary to convince the public and the legislature that CARB is a good steward of their money, CARB is injecting even more uncertainty into the market.
 - ^{183.12} Unfortunately, transparency regarding LCFS costs has been somewhat lacking and the staff's recent efforts to obfuscate the issue have been disappointing. Based on the current status of the proposal, I recommend that the Board seriously consider
 - 183.13 voting No on the amendments and direct staff to start over next year with a proposal that addresses Board Member concerns about crop-based biofuels, RNG crediting and deliverability, and includes a fully transparent discussion of potential costs of the amendments and the pros/cons of various strategies for reducing these costs.

Respectfully, James Duffy, PhD October 16, 2024

Chair Liane Randolph & Members of the Board California Air Resources Board 1001 I Street Sacramento, CA 95814

Via electronic submission

Re: Second 15-Day Changes Still Don't Address Need for Sound Science on Feedstock Issues

Dear Chair Randolph and Members of the California Air Resources Board:

The Kansas Soybean Association (KSA) appreciates the opportunity to comment on the proposed modifications (Second 15-Day Changes) to the Low Carbon Fuel Standard (LCFS) program. KSA has welcomed engagement between industry and the California Air Resources Board (CARB) and staff throughout this multi-year process to develop and update the LCFS program. KSA represents soybean farmers across Kansas on public policy issues important to the soybean industry. Growers across the state have long been committed to producing the world's food, feed, fuel, fiber, and thousands of bioproducts in an environmentally and economically sustainable way.

- 184.1 Generally, CARB's Second 15-Day Changes to revise the LCFS did not address our major concerns with provisions included in the August 15-day notice nor did it provide additional
 184.2 clarification or detail related to sustainability reporting requirements for agricultural feedstocks. We do appreciate the additional flexibility related to virgin vegetable oil feedstock
- 184.3 limitations, by extending the compliance deadline to January 1, 2028, for all approved pathways
 at the date of adoption. However, additional feedstock limitations included in the Second 15-
- Day Changes document are of significant concern.

In addition to the new proposals in the Second 15-Day Changes package, KSA remains deeply
 concerned with the drastic pivot CARB has made in the past few months related to agricultural feedstocks used for biofuels. We continue to encourage that updates to the LCFS program are based on science, as required by AB-32.

Amended Feedstock Cap Doubles Down on Non-Scientific Approach

The primary concern of KSA's remains with the proposed virgin vegetable oil feedstock cap that was included in the initial 15-Day Changes posted in August, *especially after CARB itself noted*

184.6 **that a cap will increase the utilization of petroleum diesel.** The current proposal limits, or caps, the amount of soybean oil that is allowed to generate credits in the program at an arbitrary 20%. Now, CARB is expanding on this cap in its Second 15-Day Changes with the inclusion of sunflower oil. Adding additional feedstocks to the 20% aggregate cap will further limit market access for additional gallons of low-carbon fuels.

184.6 Again, based on CARB's own analysis, a cap on credit generation for vegetable oil feedstocks will lead to an increase in fossil diesel use compared to the status quo. While KSA agrees that all feedstocks entering the California LCFS market should maintain fidelity to the assumptions underlying their life-cycle assessment (LCA), domestic agricultural feedstocks are facing a redundant, triple penalty through an outdated indirect land use change (ILUC) score, stringent sustainability reporting requirements, and a proposed arbitrary cap on credit generation while all other feedstocks, including imports, do not face the same restrictions.

184.8 The proposed cap increases soy's carbon intensity (CI) score for amounts over the cap from the established pathway, which is based on science, to the benchmark CI, which is not based on an LCA for soy. This is effectively increasing soy's ILUC score by upwards of 50% for many pathways without a scientific basis. In fact, CARB has refused to use new data related to ILUC while at the same time effectively increasing it by an arbitrary amount.

184.9 The increase in ILUC for ag feedstocks above the 20% threshold will effectively shut them out of the LCFS. Biomass-based diesel provides proven GHG and particulate emissions benefits regardless of feedstock source. Without scientific-based CI scoring for all feedstocks, soy oil biomass-based diesel will be pushed from the marketplace, even though it provides measured emissions benefits.

- 184.10
 North American agricultural feedstocks for biofuel production are already held to a high sustainability standard for participation in the Renewable Fuel Standard (RFS) and the Canadian Clean Fuels Regulations. Rather than adding additional sustainable North American feedstocks to its arbitrary proposed cap, CARB should consider updating carbon intensity analysis and
- 184.11 oversight of imported feedstocks, which are not held to the same level of accountability. In essence, let the carbon intensity scoring of feedstocks that has proven effective continue to regulate what fuels are utilized in the marketplace.

184.12 While KSA is steadfast in its opposition to the virgin vegetable oil feedstock cap and the rationale used to reach this conclusion, the Second 15-Day Changes added some additional flexibility to come into compliance with the feedstock cap. If this unnecessary cap were to move forward, we appreciate CARB's acknowledgement that biofuel production facilities cannot shift production overnight.

Carbon Intensity Scoring Updates Overdue

184.13
 KSA remains concerned that without a comprehensive update to the Global Trade Analysis
 Project model for biofuels (GTAP-BIO) that CARB utilizes, soy-based feedstocks will be
 arbitrarily phased out of the LCFS even without the additional limitations being proposed in the
 Second 15-Day Changes. Current data indicates a much lower CI score for soybeans than what
 CARB is currently using, as growers continue to improve soil practices, limit water use, lower
 on-farm emissions and more. On the one hand, CARB is recommending stringent sustainability

guardrails for U.S. soy, but on the other hand is still on track to likely phase-out soy-based biofuels from credit generation by approximately 2035 or sooner.

184.13 The California LCFS has been held in high-regard for its science-based, technology neutral, cont. emissions reductions approach. As CARB updates all other major lifecycle emissions models through this rulemaking, we once again urge action to update the GTAP-BIO model so that the most current, science-based data may be used to determine carbon intensity of all fuels in the program.

Sustainability Guardrails and Traceability Concerns

KSA also remains very concerned about the additional proposed sustainability guardrails for feedstock production. One issue is the sustainability guardrails are more onerous than the specified source requirements used for waste feedstock imports. For example, palm oil in Southeast Asia has had forced labor concerns¹, but CARB does not require used cooking oil derived from palm to track social or economic sustainability. Concerningly, petroleum also does not have to track these criteria. CARB's proposal makes it administratively easier to use non-sustainable petroleum² in the state than biofuels that have lower CI scores and are produced from sustainable feedstocks grown in the United States. This imbalanced approach will result in an imbalance in feedstocks used under the program. And of course, land use change that these guardrails are purported to prevent is already captured in the ILUC score, which makes it unclear what true purpose the additional guardrails serve.

The Second 15-Day Changes offered a bit more detail about how CARB plans to implement its reporting and requirements in terms of traceability, but we continue to have serious concerns about how this proposal would work in practice. Soybean products pass through many hands before final use and the supply chain is significantly different than other biofuels feedstocks. A soybean is grown on a farm, transported to a grain elevator, then must reach a soybean processor to be separated into soybean oil and soybean meal (crushed). The meal and oil components can then be delivered to another location to end users, like a biodiesel plant.

This is much different than the same farmer potentially delivering his corn directly from the field to a local ethanol plant where all processing steps are combined into one.

Because of this, ensuring the identity preservation of a soybean is not easily accomplished. Soybeans are a bulk commodity, and infrastructure in the U.S. was not developed to segregate subunits of the crop. This bulk handling system based on comingling is one of the inherent advantages the United States has as it reduces transportation, and subsequently on-ground emissions to deliver the feedstock to fuel producers.

¹ https://apnews.com/article/virus-outbreak-only-on-ap-indonesia-financial-markets-malaysia-7b634596270cc6aa7578a062a30423bb

² https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2022.858512/full

184.17 If CARB insists on agricultural feedstock traceability, then it should reward sustainable practices beyond what is already assumed in the LCA, or drop ILUC factor from CI scoring to avoid double penalizing feedstock growers.

Recommendations to CARB

As CARB finalizes its update to the LCFS, KSA aligns itself with the American Soybean Association (ASA) and other industry recommendations that will prevent an increase in fossil diesel use, improve carbon intensity calculations, and maintain market access for sustainable agricultural feedstock providers.

First, CARB should not apply the vegetable oil feedstock cap proposal to North American feedstocks. As noted above, these feedstocks are already subject to guardrails to ensure production on land that has not been converted since 2008. The RFS was designed specifically to prevent land conversion for biofuel production, and U.S. Department of Agriculture (USDA) data shows a decrease in farmland over the same period.

Second, CARB should convene an expert working group to consider issues related to the sustainability provisions and indirect land use change. CARB has utilized working groups in the past to analyze complex issues related to the LCFS and this is no different. Through meetings with CARB staff and board members, decisions are being made using competing schools of thought. Gathering experts to coalesce around an agreed upon *science-based approach* moving forward would ensure that CARB is utilizing the best information available. We recommend that this expert working group convenes in 2025 and provide recommendations by October 2026.

Lastly, CARB must undertake a comprehensive update of the GTAP-BIO model for soybean oil used in biofuel production. Without using the most up-to-date and accurate data, CARB is doing a disservice to the feedstock producers and California's citizens by calculating carbon intensity scores not rooted in fact. Through CARB's own analysis we know that basing decisions off old data will lead to more—not less—emissions in the California transportation sector.

Conclusion

Kansas soybean farmers are proud to play a part in the growth of cleaner, low-carbon fuels industries like biodiesel and renewable diesel. It is critical that CARB finalizes updates to the program in a way that does not arbitrarily exclude American agricultural feedstocks through policies that are not science-based and run afoul of CARB's mandate, including capping vegetable oil feedstocks and applying onerous sustainability guardrails that add cost without rewarding farming practices that lower CI.

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 184.25
 CARB's Second 15-Day Changes did not address any of the fundamental issues raised by soybean farmers in the first 15-Day Changes and fails to acknowledge the potential unintentional consequences of a feedstock cap outlined by its own employees only a few months before. CARB is required under the law to achieve the maximum technically feasible

184.25 and cost-effective reductions in GHGs. The two most recent 15-Day Changes show a lack of cont.willingness to achieve the statutory obligations set forth in AB-32.

Farmers across Kansas remain eager to continue working with CARB to support the role of agriculture in diversifying the fuel supply while reducing GHGs and increasing clean air 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 America's soybean farmers.

Sincerely,

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Kaleb Little Chief Executive Officer Kansas Soybean Association



3Degrees[•] 235 Montgomery St., Suite 320 San Francisco, CA 94104

October 16, 2024

The Honorable Liane M. Randolph, Chair California Air Resources Board 1001 I St. Sacramento, CA 95814

RE: 3Degrees Comments in Response to Proposed Amendments to the Low Carbon Fuel Standard Regulation (15-Day Changes)

Dear Chair Randolph and California Air Resources Board (CARB) Staff,

Thank you for the opportunity to provide comments in response to the Proposed Amendments to the Low Carbon Fuel Standard (LCFS) Regulation published October 1, 2024. 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 and for considering our comments that were submitted in response to the 45-Day and first 15-Day draft rule packages published earlier this year. Our recommendations for the updated LCFS proposed rule are outlined below. Under each heading, we have organized our comments in order of what we view as the key priorities for this formal rulemaking process.

185.1

The Auto-Adjustment Mechanism (AAM) should be triggerable in 2026.

We are supportive of the change to the AAM to base its triggering on data from the most recent four quarters of reporting rather than the calendar year and to have Staff publicize whether it has been triggered on a quarterly basis. However, to echo some of our previous comments and those of other stakeholders, we would suggest that the AAM should be able to be triggered a year earlier, in 2026.

While lower near-term credit prices may achieve the objective of reducing total program costs, the post-2030 targets will only be achievable through significant investments in the low carbon fuel sector this decade. Allowing the AAM to come into play at the earliest opportunity would lead to fewer surplus credits through the late-2020s and likely result in the higher prices needed to drive investment, thus mitigating pricing volatility with a smoother path towards more ambitious targets.

^{185.2} We support the change to verification requirements, including pushing out the start for EV charging to the 2026 compliance year, however we recommend clarifying that residential charging is fully exempt from site visit requirements.

We ask CARB staff to explicitly exempt all residential charging from verification requirements. We recommend that § 95500(c)(1)(E)(1) be revised to state, "EV Charging except as specified under 95491(d)(3)(A) **and 95491(d)(3)(B)**" (new text in **bold**). This captures both the metered and non-metered residential charging provisions under the exemption. Without this change, private individuals that own EVs and have no connection to the LCFS program could have their property become subject to a site visit, which poses serious privacy concerns.

185.3 **The regulation should specify that Original Equipment Manufacturers (OEMs) may act through a designated entity.**

To echo our comments submitted in response to the first 15-day rule package, we strongly support the opportunity for OEMs to generate a portion of base residential credits. However, for consistency with the other electricity credit generation types, CARB should include language where applicable (e.g., throughout § 95483(c)(1)) that the OEM **or their designee** may act. Allowing OEMs the option to have a third-party manage their participation in the program would maximize efficiency for both the OEM and CARB and streamline registration and reporting activities.

185.4 We also believe OEMs should be able to receive the same 10% administrative cost allowance as other entities. According to the Summary of Proposed Modifications, the administrative cost allocation was increased in response to public comments that a 7% limit would not be sufficient to implement projects. EDUs and OEMs will be undertaking similar holdback credit equity projects with their LCFS proceeds so it does not make sense to limit one entity type's use of those funds.

185.5 The cutoff for avoided methane pathways to receive three crediting periods should be based on applications *submitted* prior to the effective date of the regulation, rather than those certified by that date.

We propose a revision to the language in 95488.9(f)(3)(A):

Avoided methane crediting for dairy and swine manure pathways as described in (f)(1) above, and for landfill-diversion pathways as described in (f)(2) above, certified **submitted** before the effective date of the regulation, is limited to three consecutive 10-year crediting periods, counting from the quarter following Executive Officer approval of the application. [...]

CARB has a lengthy backlog of Tier 2 pathway applications, including some that have been sitting for 18 months or longer. The proposed change would not only ease the pressure on CARB
185.5 Cont. staff to complete outstanding certification processes from its backlog while also finalizing this rulemaking, but would also be more fair for participants who have submitted or are working to prepare pathways to be able to take advantage of the full three crediting periods.

185.6 **CARB should continue to allow site-specific data to be used in the Tier 1 calculator for Renewable Electricity from Dairy and Swine Manure.**

In the Tier 1 Simplified CI Calculator for Biomethane from Anaerobic Digestion of Dairy and Swine Manure Instruction Manual (DSM Manual), we ask that CARB revert to the original language requiring that site-specific data take precedence over values from Table A.9 of the Compliance Offset Protocol - Livestock Projects (LOP) as an input to the calculator for solid separation equipment. In fact the new language is in direct conflict with the language of the LOP Section 5.1(f) which states the opposite (emphasis added): "Site-specific data **must be used if available**. If site-specific data is unavailable, values from table A.9 can be used to calculate MS_AS,L". This change proposed by ARB in Table 2, Field L1.(1-6).13, Fraction of Volatile Solids Sent to Anaerobic Storage/Treatment System, and similar language imbedded within the comments of those fields for the Proposed Tier 1 Simplified Calculators, will lead to less precise calculations and an underrepresentation of emission reductions achieved and creating unfair disadvantages to farmers that utilized poorly-performing equipment in their project's baseline scenario.

Pathways that rely on site-specific values result in a far more accurate CI score than the default. Further, the LOP generally prioritizes site-specific data, also in favor of accuracy. 3Degrees has generated CI projections and Tier 2 applications based on this site-specific data which now may suffer a material deterioration of their CI due to this modification of the DSM Manual. If CARB is not willing to revise the Tier 1 instructions, then we encourage expressly stating within the Instruction Manual that this requirement applies only to Tier 1 pathways.

185.7 **CARB should allow and even encourage applicants to model baseline lagoon volatile solid buildup in the first month of reporting in the Dairy and Swine Manure calculator.**

The new October 1 draft of the Instruction Manual for the Tier 1 Simplified Calculator for DSM contains a new provision in relation to L1.(1-6).16 Volatile Solids (VS) Carryover from Previous Month. It states "If this is the first year of the project, enter zero in the first month... calculated herd populations are not allowed to establish VS carryover." We find this instruction to be misguided.

3Degrees has a long track record of issuing verified emission reductions under various standards related to dairy and swine manure digesters. It is common practice in the industry to ensure that the modeled baseline emissions are an accurate reflection of the facility's anaerobic storage lagoon, and that VS accumulation in the baseline emissions model are real and reflect actual loading, regardless of when project activities have been implemented. Even the California Cap-and-Trade program recognizes the improved accuracy with modeling the previous twelve 185.7 months of VS carryover at the first year of a digester project - subject to verification of actual herd counts and a correct reflection of those previous twelve months.

3Degrees urges CARB to reconsider the instruction to zero out VS Carryover at the start of a Project. This not only disrupts the CI score in year 1 versus years 2+, setting all such projects up for deviating from their provisionally-certified CI score upon their first annual fuel pathway report, but it also introduces an incorrect and inaccurate reflection of the baseline scenario.

3Degrees also wishes to express our support for the following proposals.

- We support the exclusion of specified source feedstocks from the sustainability requirements.
- We support the changes to hydrogen infrastructure crediting.

185.8

185.9

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 <u>hkemp@3degrees.com</u>



375 Alabama Street Suite 325 San Francisco, CA 94110

Amanda Myers Wisser Director, Policy and Regulatory Affairs amanda.myers.wisser@weavegrid.com

October 16, 2024

California Air Resources Board 1000 I Street Sacramento, CA 95814 Submitted Electronically

Re: Weave Grid, Inc. Supportive Comments in Response to Proposed Second 15-Day Changes: Proposed Low Carbon Fuel Standard Amendments

Dear Chair Randolph, Honorable Board Members, and California Air Resources Board Staff,

Weave Grid, Inc. (WeaveGrid) respectfully submits these supportive comments in response) to the California Air Resources Board (CARB) Proposed Second 15-Day Changes to the Proposed Low Carbon Fuel Standard (LCFS or Program) Amendments posted on October 1, 2024.

I. Introduction

WeaveGrid is a California-based software company that helps load-serving entities support increased adoption of electric vehicles (EVs) through greater understanding of EV driver charging behaviors and vehicle-grid integration. WeaveGrid's technology leverages utility and charging data, including the embedded vehicle telematics—data, controls, and communication systems—and the charging equipment to transform unpredictable and disaggregated EV charging loads into a cohesive network of controllable grid resources. We also support load-serving entities in engaging their EV customers with personalized messages, insights, and notifications via the web, email, and text. Our approach enables broad participation in EV load management programs, while helping reduce the costs to serve EV loads. WeaveGrid is a market leader in providing these solutions.

186.1

II. Comments

186.2

A. WeaveGrid lends overarching support for the Low Carbon Fuel Standard. WeaveGrid appreciates Staff's thoughtfulness with the further proposed amendments to the LCFS regulation. WeaveGrid also appreciates that Staff has provided ample opportunities for stakeholders to participate in the rulemaking process.

LCFS plays an essential role in supporting California's ambitious transportation electrification and climate goals. It is a source of funding for many existing and planned transportation electrification initiatives and without the important proposed amendments to this source of funding, we believe a range of the State's transportation electrification goals could be impacted or imperiled. WeaveGrid supports the regulation and the proposed amendments outlined in December 2023, August 2024, and October 2024.

The LCFS Program involves a diverse range of stakeholders. WeaveGrid is cognizant of the varied concerns in regard to the Program and is supportive of further amendments that strengthen the regulation in meeting its overall objectives to lower emissions from the transportation sector. That said, we also believe it is of critical importance that the Program move forward, potentially with identified areas for improvement following this rulemaking cycle. As stated above, LCFS is a fundamental piece of the transportation electrification support system in California. From our view, WeaveGrid does not have a unique viewpoint among the transportation electrification industry. We believe the industry as a whole is highly supportive of the regulation and we are hopeful that Staff, the Board, and stakeholders can come to an agreement in November such that the proposed amendments are approved and the Program continues to deliver significant benefits, as it has a track record of doing so.

186.3

B. WeaveGrid commends CARB for retained language on vehicle-grid (integration (VGI).

WeaveGrid is strongly supportive of the retained proposed amendments within Section 95483(c)(1)(A)5.b. originally from the December 19, 2023 proposed amendment.¹ As EV adoption in California increases, California needs to adapt the grid accordingly. WeaveGrid appreciates that the focus of these proposed additional allowable holdback projects supports greater grid investment to accommodate a growing number of EVs on California's roads. We support the additions in this section, including investments in distribution infrastructure for EV charging, support for vehicle-grid integration (VGI) projects, and

¹ Appendix A-1 Proposed Regulation Order: Proposed Amendments to the Low Carbon Fuel Standard Regulation (Appendix A-1), Section 95483(c)(1)(A)5.b., p. 46, https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/2nd_15day_atta-1.pdf.

186.3	technology, such as EV load management software, that can avoid or reduce grid upgrades.
Cont.	Distribution grid investments ensure that charging infrastructure needs are met, especially
	in underserved communities and for medium- and heavy-duty electric vehicles. VGI
	projects help EV drivers charge when and where it is most beneficial for the grid and
	customers. ² VGI enables cleaner charging by increasing renewables integration and
	providing a signal for drivers when it is cleanest to charge. ³ Technology helps enable VGI
	and makes it more driver-friendly by being more automated. VGI projects that use
	automated technology can benefit from greater participation and, therefore, better
	outcomes.

Increasing the use of VGI in California is critical to meet clean electricity, clean transportation, and affordability goals. Electrical distribution utilities (EDUs) are the key stakeholder to enable effective VGI. More sophisticated VGI includes managing EV charging based on ever-changing grid conditions. To enable cheaper and cleaner charging, technical grid inputs are required for VGI. For example, renewable energy curtailments can be reduced by charging more vehicles when renewable energy generation is abundant. Another example is avoiding charging when there is higher grid congestion at a local distribution or bulk system level. Among the many approaches to VGI, EDUs are best positioned to incorporate relevant grid signals into their VGI projects. It is for this reason that we emphatically support the VGI-related pre-approved uses for EDU holdback credits.

186.4

C. WeaveGrid commends CARB for increasing the clarity of EDU holdback credit requirements and pre-approved uses.

The LCFS regulation has a relatively narrow set of specified projects that qualify as holdback credit equity projects, per Section 95483(c)(1)(A)5.a.⁴ This can result in limiting the scope of what EDUs can do with this funding. In our view, any transportation electrification efforts that meaningfully benefit disadvantaged, vulnerable, and underserved communities should be eligible for LCFS funding. This is a best practice in line with what we see from other commissions, utilities, and federal and state agencies. WeaveGrid appreciates the amendment in this most recent October 2024 update that offers greater detail on opportunities to propose new holdback equity projects under the LCFS regulation, per Section 95483(c)(1)(A)5.a.ix.⁵ This is particularly important given that the California Public Utilities Commission also regulates use of EDU holdback credits. Increased clarity and flexibility improve the implementation process across two different state agencies.

² Lawrence Berkeley National Laboratory, Quantifying the Financial Impacts of Electric Vehicles on Utility Ratepayers and Shareholders, https://emp.lbl.gov/publications/quantifying-financial-impacts. ³ California Public Utilities Commission Decision 20-12-029.

⁴ Appendix A-1, Section 95483(c)(1)(A)5.a., p. 43.

⁵ Appendix A-1, Section 95483(c)(1)(A)5.a.ix., p. 46.

III. Conclusion

WeaveGrid appreciates the opportunity to submit these supportive comments. We thank CARB for consideration of these comments and look forward to continued engagement.

Respectfully submitted,

<u>/s/ Amanda Myers Wisser</u> Amanda Myers Wisser Director, Policy and Regulatory Affairs WeaveGrid Phone: 650-590-9021 Email: amanda.myers.wisser@weavegrid.com October 16, 2024

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

Re: Comments on the Second Proposed 15-Day Changes to the Low Carbon Fuel Standard (LCFS) Amendments

Dear Ms. Sahota:

We represent a group of distinct businesses and perspectives related to the Low Carbon Fuel Standard (LCFS) and the State's various climate change-related programs. Individually, we each have specific priorities and recommendations for the program, which we may address in separate comment letters. Collectively, however, we agree that the LCFS is a critical program for achieving the State's methane reduction, transportation electrification, and other climate change related goals.

- 187.1 We would like to thank CARB for incorporating additional flexibility in the recent proposed 15-day changes to the LCFS, particularly the added flexibility for Heavy-Duty Fast Charging Infrastructure (FCI) crediting. We also appreciate that CARB has recognized the importance of book-and-claim access for biomethane-to-electricity pathway crediting, which reflects the Board's openness to feedback from stakeholders like us.
- 187.3 However, we are concerned that book-and-claim accounting for electricity pathways may exclude linear generators and green hydrogen-to-electricity as an eligible pathway. As Prologis' pioneering real-world efforts to speed development of industrial charging infrastructure for heavy-duty electric fleets shows, linear generators are a critical technology to meet our customers' and the state's heavy-duty electrification goals with similar emissions (essentially zero) as fuel cells but also immediately affordable, flexible between hydrogen- and biomethane-to-ZEV pathways, and able load-follow megawatt-level EV charging events without degradation. Linear generators are now eligible under California's Renewable Portfolio Standard (RPS) and are business critical to enterprises such as Prologis, which sees 36% of U.S. goods move through its U.S.-based facilities.¹

Explicitly allowing book-and-claim access for green hydrogen-to-electricity pathways would provide additional flexibility for supporting the state's transportation electrification and renewable hydrogen goals. We ask that the Board to clarify that linear generators are an eligible technology under the biomethane-to-electricity book-and-claim provisions. We also ask that CARB enable book-and-claim accounting for green hydrogen-to-electricity pathways via hydrogen-blending gas distribution networks within California. Our feasibility assessments show warehouse rooftop solar electrolysis supplying electric vehicle charging hubs can be an economical and expedient pathway to decarbonization in California.

187.4 Linear Generators Now RPS Eligible, Like Fuel Cells

The clean emissions performance of linear generators and comparability to fuel cells was recently

¹ <u>https://www.prologis.com/news-research/economic-impact-report</u>

187.4 Cont. validated through AB 1921, which was signed into law by Governor Newsom last month. AB 1921 explicitly includes linear generators using renewable fuels as eligible under the state's RPS, just like fuel cells currently are. <u>This bill received no "no" votes throughout the process</u>, reflecting widespread stakeholder buy-in and strong legislative intent to promote linear generators as part of California's broader clean energy goals. We urge CARB to align the LCFS regulations with this legislation by expressly including linear generators as eligible technology for biomethane-to-electricity crediting.

187.5 Linear Generators: Clean Technology with Low Emissions

Linear generators, such as those developed by Mainspring and Hyliion, are clean, low-emission technologies. We understand that CARB staff have seen data comparing emissions from linear generators to those from fuel cells, which demonstrate similar criteria pollutant emissions between the technologies. Indeed, data for Prologis' Denker Avenue EV charging depot in Los Angeles shows that linear generators achieve more than 97% NOx reductions compared to diesel trucks, with minimal VOC emissions (*see appendix following letter*). These results demonstrate the technology's potential for significant emissions reductions, particularly in applications supporting electric vehicle (EV) charging. Including linear generators in the LCFS program aligns with CARB's objectives of reducing transportation-related emissions and promoting cutting-edge, clean technologies.

As detailed in our previous comments,² Prologis Mobility and Performance Team, a Maersk company that operates electric vehicles across the country, recently demonstrated a unique solution to infrastructure challenges facing heavy-duty fleet operators by developing the world's largest EV charging project powered by a self-sufficient microgrid, which uses Mainspring technology with green hydrogen, renewable natural gas, and green methanol fuel flexibility.³ The project was constructed in five months, rather than the years it would have taken otherwise (as estimated by the local utility), allowing the fleet to electrify quickly while interconnection to the electrical grid proceeds later. Once the project is directly interconnected to the grid, the added resiliency for critical EV fleet operations during periods of grid stress or power outage will be critical. The infrastructure also preserves partial infrastructure flexibility for expanding to support fuel cell vehicles in the future. This is a replicable model that can serve to accelerate progress toward the State's ZEV goals.

The ability to use renewable fuels, such as biomethane or renewable hydrogen, would further align these projects with California's climate goals. Explicitly including linear generators would provide additional market clarity and flexibility to support the use of this pioneering model to overcome infrastructure challenges that hinder CARB's transportation electrification goals. Similarly, allowing for book-and-claim access for renewable hydrogen-to-electricity pathways would provide additional optionality and cost savings to support resilient, renewable EV charging.

Critical technoeconomic risk mitigations of linear generators

Linear generators offer critical real world operational risk mitigations that make them especially important tools for EV charging infrastructure:

• **Cost-Effective**: Linear generators today are 25%-50% the capital cost of commercially available (fuel cells. They also last for 20 years and do not degrade which results in significantly lower)

² https://www.arb.ca.gov/lists/com-attach/7539-lcfs2024-VDdSNVMgUmMHXgBi.pdf

³ <u>https://www.prologis.com/insights/success-stories/north-americas-largest-heavy-duty-ev-charging-hub-powered-microgrid</u>

107 C	maintenance and lifecycle costs of electricity for our customers.
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- **ZEV pathway flexible**: Linear generators can handle the volatility and nascency of green fuel markets today by allowing fuel switching from one green fuel to another green fuel during times of supply chain stress for the incumbent. For example, the margin for error is unacceptably small in operations that use fuel cells for the next few years while green hydrogen supply chains are in infancy.
 - **Dispatchable**: Linear generators are genuinely dispatchable machines. For a business with many challenging load profile cases this makes their selection simple and makes designs and maintenance programs transferable from one site to the next.
 - **Efficient**: Linear generators have exceptional fuel efficiencies that are competitive, predictable and do not degrade. This is critical for low lifecycle costs of electricity for our customers.

These features, along with their low emissions profile, make linear generators an ideal fit for California's LCFS book-and-claim program.

Conclusion

We strongly support the LCFS and greatly appreciate CARB's continued leadership in refining the program to support the State's transportation electrification goals and foster growth of low-carbon technologies. By explicitly including linear generators in the program, CARB can further accelerate the deployment of low-emission EV charging infrastructure and align the program with the AB 1921 statute. We look forward to continuing to collaborate with CARB to meet California's ambitious climate goals. The exact changes we request are shown below the signatures.

Thank you for considering these comments and recommendations.

Respectfully submitted,

Alexis Moch Vice President, Government Affairs Prologis

Kent Leacock Senior Director, Public Affairs Mainspring **Bobby K. Cherian** Senior Vice President, Government Affairs Hyliion Inc

Allie Detrio Senior Advisor Microgrid Resources Coalition

Section §95488.8(i)(2):

Book-and-Claim Accounting for Pipeline-Injected Biomethane Used as a Transportation Fuel, to Produce Electricity for EV Charging, or to Produce Hydrogen. Indirect accounting may be used for RNG used as a transportation fuel, to produce electricity using a fuel cell<u>, including a linear generator</u>, for EV charging, or to produce hydrogen for transportation purposes (including hydrogen that is used in the production of a transportation fuel), 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 to produce electricity using a fuel cell, including a linear generator, for EV charging, or as an input to hydrogen production, 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 to produce electricity using a fuel cell, including a linear generator, for EV charging, or as an input to hydrogen production must demonstrate compliance with the following requirements:
 - 1. Starting January 1, 2041, for bio-CNG, bio-LNG and bio-L-CNG pathways, and January 1, 2046, for biomethane used to produce electricity using a fuel cell, including a linear generator, for EV charging, or as an input to hydrogen production, 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. Notwithstanding the above, if the number of unique Class 3-8 ZEVs reported or registered in California exceeds 132,000 ZEVs or NZEVs on December 31, 2029, based on the evaluation and notification specified by subsection 95488(d)(1), then the entity reporting under bio-CNG, bio-LNG and bio-L-CNG pathways for CNG vehicles must demonstrate the physical flow listed above after December 31, 2037. 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.
- (C) To substantiate RNG quantities injected into the pipeline for dispensing as bio-CNG, bio-LNG, or bio-L-CNG, or to produce electricity using a fuel cell, including a linear generator for EV charging, or as an input to hydrogen production, the pathway application and subsequent Annual Fuel Pathway Reports must include the following documents linking the environmental attributes of RNG (in MMBtu or Therms) with corresponding quantities of natural gas withdrawn:
 - 1. Unredacted monthly invoices showing the quantities of RNG (in MMBtu) sourced and the contracted price per unit;

- 2. Unredacted contract by which the fuel pathway holder obtained the environmental attributes.
- (D) Starting January 1, 2041, for bio-CNG, bio-LNG and bio-L-CNG pathways (unless the accelerated timeline is activated by the criteria described in section 95488.8(i)(2)(B)1.), and January 1, 2046, for biomethane used to produce electricity using a fuel cell, including a linear generator for EV charging, or as an input to hydrogen production, to substantiate RNG quantities injected into the pipeline for biomethane fuel pathways associated with projects that break ground after December 31, 2029, the pathway application and subsequent Annual Fuel Pathway Reports must include the documents required by section 95488.8(i)(2)(C) as well as the following documents.
 - 1. Monthly pipeline nomination reports for each pipeline along the delivery path.

Section §95488.8(i)(3)(A):

(A) Low-CI hydrogen is injected into a **dedicated hydrogen** pipeline physically connected to California.

Fuel	Feedstock	Process Energy	CI (gCO2e/MJ)
Low-Cl electricity produced by fuel cell <u>or</u>	Biomethane from Dairy and Swine Manure	N/A	-300
linear generator			
Low-Cl electricity	Electrolysis of Water	<u>N/A</u>	<u>110</u>
produced by fuel cell	using zero-Cl or		
or linear generator	Negative-Cl electricity		

Table 8. Temporary Pathways for Fuels with Indeterminate CIs

Appendix - Comparison of Emissions of Alternative technologies at Denker



MEMORANDUM

June 28, 2024

TO: JT Steenkamp, Prologis

FROM: Patrick Couch, GNA

SUBJECT: Comparison of emissions for alternative technologies at Denker

Background

Prologis operates a microgrid at its Denker facility in Los Angeles designed to support charging of heavyduty electric vehicles. The microgrid includes 8.64MW of EV chargers (24x 360kW chargers), supplied by ~10MW of peak on-site power via 2.76MW of linear generators and 7.2 MW (18MWh) of battery storage. The facility enables the use of heavy-duty electric vehicles (HDEV) that avoid emissions from traditional diesel trucks that would otherwise operate from the facility. However, the site's use of linear generators does entail some direct emissions. This memorandum summarizes the methodology and results used to compare the emissions associated with the Denker facility under a diesel baseline, the constructed HDEV project, and two alternative technology options; 1) the use of near-zero emission natural gas trucks and 2) the use of solid oxide fuel cells (SOFC) in place of the linear generators.

Methodology

Emissions for oxides of nitrogen (NOx), particulate matter (PM2.5 and PM10), and volatile organic compounds (VOC) were characterized for each technology option, with two exceptions. PM emissions data were not available for the linear generator or SOFC technologies. All emissions were characterized on a grams-per-mile basis as this most uniformly compares the work done by the trucks that would operate at the facility. Further, all trucks were assumed to be Class 8 semi-tractors typical of trucks serving the San Pedro Bay Ports and operating in local goods movement.

Data sources and specific methods by technology type

Diesel – emissions data for each pollutant were taken from California Air Resources Board's (CARB) EMFAC emissions model for on-road vehicles. EMFAC is the required emissions model for estimating emissions inventories as part of the State Implementation Plan required under the federal Clean Air Act. The model provides estimates of total emissions (tons per year) for each pollutant and total miles traveled per year by vehicle type. Note that the EMFAC model provides emissions for Reactive Organic Gases (ROG) and it was assumed that ROG and VOC emissions are approximately equal.

For this analysis, the baseline diesel truck emissions and activity reflected the following EMFAC settings:

MODEL SETTING	VALUE
Region	South Coast Air Basin
Calendar Year	2022
Vehicle Category	T7 POLA Class 8
Model Year	2015
Speed	Aggregate

www.trccompanies.com

To: JT Steenkamp, Prologis Subject: Comparison of emissions for alternative technologies at Denker Date: June 28, 2024

Page 2 of 3

CNG with Near-zero Engine – emissions data for each pollutant were taken from EMFAC. The truck model year is assumed to be 2022 and is intended to reflect an alternative deployment of new vehicles (CNG rather than EV). The following EMFAC settings were utilized:

MODEL SETTING	VALUE
Region	South Coast Air Basin
Calendar Year	2022
Vehicle Category	T7 POLA Class 8
Model Year	2022
Speed	Aggregate

MFC to EV – this scenario reflects direct emissions occurring from natural-gas fueled linear generators (also called a "mechanical fuel cell" or MFC) associated with the generation of electrical energy needed to charge and power a Class 8 HDEV. Test data provided by the generator manufacturer, Mainspring Energy, were used to derive emissions from the generator on a grams-per-kilowatt-hour (g/kWh) basis. Emissions data were averaged over three tests and included two "cores" or power-generating units. Testing was performed under South Coast Air Quality Management District (SCAQMD) test methods 100.1, 2.3, 4.1, and 25.3.

Energy-specific mass emissions from the generators (in g/kWh) were converted to grams per mile of HDEV operation assuming an energy economy of 2.1 kWh/mile. This factor is consistent with energy economies reported for Class 8 trucks operating in the South Coast Air Basin in drayage and local goods movement.

SOFC to EV – this scenario reflects direct emissions occurring from a solid oxide fuel cell associated with the generation of electrical energy needed to charge and power a Class 8 HDEV. Emissions data were based on the Series 10 product fueled with standard pipeline natural gas. Data provided by the generator manufacturer were used to derive emissions from the generator on a grams-per-kilowatthour (g/kWh) basis. Testing was performed under SCAQMD test methods 100.1 and 25.3.¹

Energy-specific mass emissions from the generators (in g/kWh) were converted to grams per mile of HDEV operation assuming an energy economy of 2.1 kWh/mile. This factor is consistent with those reported for Class 8 trucks operating in the South Coast Air Basin in drayage and local goods movement.

Results

Based on the assumptions and data sources described above, the following emissions rates were calculated for each technology type.

PROJECT TYPE	NOX (G/MI)	PM 2.5 (G/MI)	PM 10 (G/MI)	VOCS (G/MI)
Linear Generator with NG	0.06	N/A	N/A	0.06
Solid Oxide Fuel Cell	0.002	N/A	N/A	0.01
Diesel Trucks	1.78	0.03	0.03	0.04
CNG NZE Trucks	0.32	0.003	0.003	0.02

¹ https://www.bloomenergy.com/wp-content/uploads/Series10-V12.pdf

www.trccompanies.com

To: JT Steenkamp, Prologis Subject: Comparison of emissions for alternative technologies at Denker Date: June 28, 2024

As shown, the linear generator and SOFC technologies offer the lowest NOx emissions rates, providing over 96% NOx reductions relative to the diesel baseline.

As previously noted, PM emissions data were not available for the SOFC and linear generator but are expected to be very low owing to the continuous (not intermittent) fuel oxidation processes that are inherent in these technologies.

VOC emissions for all technologies are very low. Typically, diesel engines emit VOCs predominantly as hydrocarbons. Certification levels for hydrocarbon emissions from diesel engines are often 90% or more below the current State and federal emissions limits. As all technologies produced VOC emissions of the same order of magnitude as the baseline diesel engine, it is evident that the VOC emissions are well below the existing diesel standards.

SEVANA 🍪 BIOENERGY

October 16, 2024

California Air Resources Board 1001 I Street Sacramento, CA 95814

RE: Sevana Bioenergy Comments on the Second 15-Day Amendments to the Low Carbon Fuel Standard

Thank you for the opportunity to submit comments on the second 15-Day Amendments to the Low Carbon Fuel Standard.

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. Sevana Bioenergy 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 emerging low carbon fuels. The science-based, technology-neutral and inter-state commerce compliant framework of the LCFS make it a strong and tested policy. Unfortunately, we have seen decarbonization projects being cancelled or shut down from depressed LCFS credit prices and look forward to this rulemaking to return the program to balance.

Support for more ambitious and effective targets and AAM

188.1 We would like to express our general support for the new amendments to the program, and would recommend CARB consider more ambitious targets in subsequent rulemakings for overall CI reduction targets higher than 30% by 2030. We support the step down of 9% but it could be even larger. Also we support the modifications made in the second 15-Day changes to the auto-acceleration mechanism (AAM). Switching from a calendar year of data to the most recent four quarters of data as the determination for whether the AAM is triggered will allow for greater transparency and market certainty to LCFS participants, and urge CARB to clarify this AAM will be allowed to trigger as early as possible.

Maintain avoided methane and deliverability mechanics particularly for projects under construction

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 and use reality-based counterfactuals to help mitigate methane emissions as rapidly and for as long as practical. It is important to clarify that any change to avoided methane crediting from three to two periods only apply to new projects.

188.4 To avoid stranding capital invested already in such projects and potentially cause shut downs of brand new under construction methane reducing projects due to insufficient methane crediting periods, which is clearly antithetical to the purposes of the LCFS, the revised language is not clear enough to address this issue. We

SEVANA 🍪 BIOENERGY

- 188.4 would recommend changing the three-period crediting period eligibility to include projects like ours being built on the basis of 30 years of operating life by substituting "*under construction before the effective date*" rather than the 15 day amendment's current "*certified before the effective date*"
- 188.5 Furthermore, we recommend CARB avoid opening a pandora's box involved in changes in eligibility of deliverability. The current tracking mechanisms are supported by science and aligned with programs such as the RFS and other state low carbon fuel regulations. 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.

True up and 4:1 penalty

We support a clarification made for true ups to actual verified CI versus the temporary pathway CIs or when no temporary pathway is offered, to also include **projects under construction** and those using **TPCs when the regulation takes effect**.

188.7 We also highly recommend removing the newly proposed 4:1 penalty on actual versus temporary or provisional CI, which may be due to factors outside the registrant's control.

188.8 Linear Generators should be treated similarly to Fuel Cell to EV Pathways

We recommend that this framework be improved further by allowing other forms of low-emission gas power generation to use the same accounting framework, including linear generators.

Thank you for taking our comments into consideration. We look forward to an expedient conclusion of the final rulemaking.

Sincerely,

Steve Compton President & COO Sevana Bioenergy

Sevana Bioenergy LLC

October 16th, 2024

Chair Liane Randolph and Board Members California Air Resources Board 1001 I Street Sacramento, CA 95814

RE: Comments of Paul D. Hernandez on the Proposed Low Carbon Fuel Standard (LCFS) Amendments, Second 15-Day Changes to Proposed Regulation Order

Submitted electronically to: https://ww2.arb.ca.gov/applications/public-comments.

Dear Chair Randolph and Members of the Board:

Pursuant to the California Air Resources Board's (CARB's) Second Notice of Public Availability of Modified Text and Availability of Additional Documents and/or Information for the Proposed Low Carbon Fuel Standard Amendments, released October 1, 2024 ("Second 15-day Amendments"), I respectfully submit the following comments. My name is Paul Hernandez. For more than 10 years I have worked in the transportation electrification sector with a focus on California's zero-emission vehicle (ZEV) policies, and I am in the early stages of establishing a California-based startup. Given this important juncture for the LCFS program, I wanted to provide comments to CARB in a personal capacity to support Second 15-day Amendments, to specifically support its transportation electrification provisions, and to further share ideas on how CARB can strengthen the LCFS program's alignment with the e-mobility sector.¹

189.1Support for Second 15-Day Changes

I commend CARB staff on their continued initiative to build an updated and robust LCFS program. In addition to the Second 15-day Amendments, I have reviewed the 2024 Rulemaking Documents, as well as the meeting and workshop docket materials dating back to February 22, 2023.² As demonstrated in these documents, and as detailed throughout the robust workshop series, I believe that CARB has indeed incorporated input from a diverse array of stakeholders to arrive at the current and balanced Proposed Regulation Order. As such, I am pleased to

¹ In this case, I use a general definition of e-mobility, or electromobility, which includes the use of electric powertrains and technologies to electrify vehicles and transportation. It includes Vehicles: Cars, buses, trucks, off-road vehicles, ships, and ferries that are fully or partly electric, like hybrids; Powertrains: Full electric vehicles, plug-in hybrids, and hydrogen fuel cell vehicles; Communication technologies: In-vehicle information and communication technologies; and Connected infrastructures: Connected infrastructures to enable electric propulsion

² Website Access: <u>https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard/lcfs-meetings-and-workshops</u>

189.1 support CARB's Second 15-day Amendments and more widely the updates that to the LCFS program that are under consideration by the Board.

189.2 **Support for Transportation Electrification (TE) Provisions**

With respect to LCFS updates in support of the TE sector, I am especially appreciative of CARB's continued leadership as demonstrated by the inclusion of multiple TE provisions, including the proposed amendments to include: a) the shared fleet-owned shared HD- Fast Charging Infrastructure (FCI) charging site provisions; b) the DC FCI Pathways for Light- and Medium-Duty Charging Sites, and d) DC FCI Pathways for Heavy-Duty charging sites. The inclusion of these provisions will encourage fleet diversification and continue to promote the deployment of ZEV infrastructure for multiple fleet classes, which deeply aligns with a diverse array of the state's TE policy drivers.

Recommend Modifications to Section 95488.7(a)(3).

There are opportunities to strengthen the LCFS program's alignment with innovations occurring within the e-mobility sector. (Here, I encourage CARB to consider providing adjustments to Section 95488.7(a)(3) specifically to allow for stakeholders to file innovative Economic Efficiency Ratios (EERs), even in scenarios where the fuel-vehicle combination is a variation of the EERs (that are already included in the Regulation's Table 5.³ At this time, Tier 2 EER pathways are only allowed for fuel-vehicle combinations not already included in the Regulation's Table 5, which I believe may unintentionally deter some entities within the e-mobility sector from exploring EER innovation.

The current regulation states that for:

• "Tier 2 Pathways for EER-Adjusted Carbon Intensity. Applicants supplying fuel for a transportation application that is not included in Table 5 may apply for an EER-adjusted carbon intensity for reporting and credit generation purposes."

To embolden EER innovations, I would recommend the following adjustment (see *underlined*):

"Tier 2 Pathways for EER-Adjusted Carbon Intensity. Applicants supplying fuel for a transportation application that is not included in <u>(or is a scientifically justifiable</u>)
 <u>variation or combination of EERs from</u>) Table 5 may apply for an EER-adjusted carbon intensity for reporting and credit generation purposes."

Allowing for EER innovation in this manner would embolden the e-mobility sector to utilize the Tier 2 Pathway process to work with CARB to develop innovative solutions that help meet CARB's objectives. Moreover, I envision that the e-mobility sector can indeed demonstrate and prove additional EER value to CARB within the LCFS regulatory regime while fortifying

³ Tier 2 EER pathways are only allowed for fuel-vehicle combinations not already included in the Regulation (see section 95488.7(a)(3) for the rules governing these types of pathways, pages 123-124 of the Regulation text).

189.3 proposed methodology consistent with the scientific defensibility that CARB requires.⁴ Moreover, this adjustment would simply allow for entities to be considered eligible to apply for the Tier 2 Pathway review process, where deeper review and methodology critique occurs.

Indeed, there are multiple scenarios related to a vehicle's capacity, efficiency, technology use, vehicle utilization, and other factors that (if more precisely captured within the LCFS program) may result in added benefits (environmental and otherwise) from the program. As such, I would encourage CARB to consider the exploration of EER innovation as part of its final decision within this Rulemaking, and consider making the adjustments as proposed earlier with respect to Table 5.

Conclusion

Thank you for the opportunity to provide these comments.

189.4

I am pleased to support the Second 15-day Amendments, and more broadly thank CARB and staff for their 20-month initiative to revise and update the LCFS program. I am especially pleased that the program is taking on multiple provisions which will further help the state achieve its TE infrastructure and ZEV deployment goals, and I look forward to the opportunity to further share my ideas on how to better align the provisions of Section 95488.7(a)(3) with the needs of the innovative e-mobility sector.

Please reach out to me with any questions or for clarification regarding this correspondence.

Respectfully Submitted,

Paul D. Hernandez

Email: paul.david.hernandez.mpia@gmail.com

⁴ **Scientific Defensibility.** For a proposed Tier 2 pathway to be certifiable by the Executive Officer, the fuel pathway applicant must demonstrate that the life cycle analysis prepared in support of the pathway application is scientifically defensible in the Executive Officer's best engineering and scientific judgment.

Comment Log Display

Here is the comment you selected to display.

Comment 190 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Paul
Last Name	Rozenberg
Email Address	Non-web submitted comment
Affiliation	
Subject	Suburban Propane - Comments on Second 15-Day Changes to the Proposed LCFS Amendments

Comment	Comment received during 2nd 15-Day comment period. Submitted by Clerk on Commenter's behalf. "Dear Sir/Madam, On behalf of Suburban Propane, attached are our comments on the Second 15-Day Changes on the Proposed Low Carbon Fuel Standard Amendments. I am having some technical difficulties in submitting the comments online, which is why I am emailing them in. Please let me know if you have any questions or need additional information." Thanks, Paul PRozenberg@suburbanpropane.com
Attachment	www.arb.ca.gov/lists/com-attach/9-lcfs2024-2nd15day-AHNSIQFiBSMFcQFj.pdf
Original File Name	Suburban Propane - Comments on Additional Modifications to the Proposed LCFS Amendments - Paul Rozenberg.pdf
Date and Time Comment Was Submitted	2024-10-18 10:51:11

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Board Comments Home

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Paul M. Rozenberg Senior Manager Government Affairs & Corporate Communications

prozenberg@suburbanpropane.com (p) 973.503.9915 (c) 862.217.9643

October 14, 2024

VIA ELECTRONIC SUBMISSION

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

RE: Comments on the Second Modifications to the Proposed Low Carbon Fuel Standard Amendments

Dear Chair Randolph:

190.1

Suburban Propane writes with regard to the second round of modifications made to the Proposed Amendments for the Low Carbon Fuel Standard ("LCFS") released on October 1, 2024 (the "Modified Proposed Amendments"). Suburban Propane has served customers for 96 years and is the nation's third-largest propane retailer with operations in 42 states. In California, we currently have 266 employees at 71 locations, serving more than 55,000 customers.

In our comments dated February 19, 2024 regarding the initial Proposed Amendments published December 19, 2023 (the "Initial Proposed Amendments") and our comments dated August 20, 2024 regarding the initial modifications, we urged CARB to amend two specific provisions:

- 1. Increase the flexibility of the Automatic Acceleration Mechanism ("AAM") by accelerating the CI benchmark reduction proportional to how much the credit bank exceeds the proposed trigger threshold up to one full year; and
- 190.2 2. Remove the biomethane credit phaseouts.

Board staff has not adopted these revisions, and the Modified Proposed Amendments make minor changes to the AAM or the biomethane credit phaseouts. We urge CARB to reconsider and include the two amendments described above.

Automatic Acceleration Mechanism

The Initial Proposed Amendments created an Automatic Acceleration Mechanism (AAM) that tightens the annual CI benchmarks if two conditions are met: "(1) when the pool of outstanding credits (the credit bank) exceeds three quarters of average annual deficits generation, and (2) when the number of credits generated each year exceeds the number of deficits generated each year."¹ If those conditions are met, the AAM "would advance the entire benchmark schedule by one compliance period, increasing the stringency of the regulation for all subsequent years relative to what it otherwise would have been."² The Modified Proposed Amendments slightly amends the AAM so that the trigger determination will be based on data from the most recent four quarters of reporting, not the previous calendar year. However, "the benchmark schedules would still be adjusted on the same frequency and timing as previously proposed."³

^{190.3} Requiring acceleration of the benchmark reduction schedule by an entire year gives CARB too little room to maneuver. If the credit bank just barely reaches the threshold required to trigger the AAM, the benchmark reduction schedule leaps forward by an entire year, instead of considering a minor adjustment to maintain the credit market's stability. This could lead to CARB overtightening the benchmark reduction schedule, leading to a saturation of deficits and more market volatility.

We recommend the AAM create more flexibility by allowing CARB to proportionally accelerate the benchmark reduction schedule based on how much the credit bank exceeds the trigger threshold, up to the CI benchmark for the following year. This would help maintain the stability of the credit market and thwart any potential overcorrection, which contributes greatly towards supporting long-term investment in transportation decarbonization.

Biomethane Crediting

With a CI score as low as -532.74, biomethane, also known as renewable natural gas (RNG), is one of the most powerful tools in decarbonizing the transportation sector. The Initial Statement of Reasons for the Initial Proposed Amendments acknowledges that "[b]iomethane has played a role in contributing to the overall decrease in carbon intensity of the transportation fuel pool" and [c]apturing methane from California's methane sources (e.g., landfills, dairies, and wastewater) is critical for achieving California's climate targets."⁴

However, notwithstanding the benefits RNG brings to California's transportation fuel pool, each iteration of the LCFS Amendments seeks to phase out crediting for RNG. As currently drafted, for projects that

¹ See <u>https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/lcfs_appe.pdf</u>.

² Id.

³ See <u>https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/2nd_15day_notice.pdf</u>.

⁴ See <u>https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/isor.pdf</u>.



break ground after December 31, 2029, RNG pathways, along with avoided crediting, would be phased out after December 31, 2040. Fuel pathways for RNG with avoided methane used to produce hydrogen would be phased out after December 31, 2045. In addition, while the number of 10-year crediting periods for projects that are certified before the regulation goes into effect have reverted back to three, Projects that are certified after the regulation goes into effect and before January 1, 2030 are eligible for only two crediting periods.

190.4 Phasing out RNG pathways is shortsighted and stymies the LCFS's effectiveness by removing a carbonnegative fuel source from the program. CARB argues for the phaseout because natural gas transportation fuel demand "is only about 3% of overall natural gas demand in California, and achieving deep GHG reductions will have to include displacing fossil gas in sectors of the economy beyond transportation."⁵ This type of reasoning is antithetical to the spirit of the LCFS program, which is to incentivize the increased use of low-carbon energy sources and spur innovation in the production of even lower carbon transportation fuels. According to the U.S. Department of Energy, since the beginning of the LCFS in 2011, natural gas fuel consumption in California's transportation jumped from approximately 211.5 million gasoline gallon equivalents (GGEs) in 2011 to 403.7 million GGEs in 2021.⁶ If those gallons were replaced with carbon-negative RNG, it would accelerate the decarbonization of the transportation sector. Further, the availability of RNG pathways under the LCFS led to increased production of RNG. In fact, the potential of securing more LCFS credits was one of the factors that led Suburban Propane to invest in RNG. We created a new subsidiary, Suburban RNG, specifically to acquire assets and increase production of RNG.

Phasing out these pathways removes a key low-carbon and carbon-negative energy source from the LCFS. We ask that CARB remove the RNG pathway phaseout provisions from the Modified Proposed Amendments and restore the three 10-year crediting periods for all RNG projects.

Conclusion

For the reasons above, we urge the Board to reconsider and adopt the two amendments we laid out in our February 12, 2024 and August 20, 2024 comments: increase flexibility of the Automatic Acceleration Mechanism by accelerating the CI benchmark reduction schedule proportional by how much the credit bank exceeds the trigger threshold, up to one full year; and remove the biomethane pathway phaseout. We would appreciate the opportunity to discuss these changes, as well as other ways to reduce greenhouse gas emissions, with CARB staff. Thank you for your consideration.

⁵ Id.

⁶ See <u>https://afdc.energy.gov/states</u>/ca.

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Sincerely,

/s/ Paul M. Rozenberg

Paul M. Rozenberg Sr. Manager, Government Affairs & Corporate Communications Suburban Propane

SAN PEDRO BAY PORTS

October 15, 2024

Rajinder Sahota Deputy Executive Officer, Climate Change & Research Edie Chang, Deputy Executive Officer, Planning, Freight & Toxics Matt Botill, Chief, Industrial Strategies Division California Air Resources Board 1001 I Street, Sacramento, CA 95814

Submitted electronically at: https://www.arb.ca.gov/lispub/comm/iframe_bcsubform.php?listname=lcfs2024

Re: San Pedro Bay Ports Comments to the California Air Resources Board (CARB) Regarding E-Methanol as an Opt-In Fuel for Maritime Applications within the Low Carbon Fuel Standard (LCFS) Program

Dear Ms. Sahota, Ms. Chang, and Mr. Botill,

The San Pedro Bay Ports (Ports) thank you for convening a meeting with key stakeholders, including HIF Global and their counsel, Lifecycle Associates, Vopak, Centerline Logistics, Idemitsu, CMA CGM, and the Methanol Institute on September 26, 2024, to explore the opportunity methanol presents as a marine fuel in the near term to reduce emissions from vessels visiting California ports. According to the 2023 San Pedro Bay Ports Emissions Inventory, vessels are the largest contributor to PM_{2.5}, diesel particulate matter, nitrogen oxides, and sulfur oxides at the two Ports. Vessels are the second largest contributor to greenhouse gas emissions. Additionally, we expect that ocean-going vessel emissions will make up a larger proportion of emissions in the South Coast Air Basin as other sources of emissions are addressed overtime. Therefore, it's critical to start expanding the suite of tools utilized today to mitigate vessel emissions, including new incentives for cleaner fuels.





Port of Los Angeles | Environmental Management 425 S. Palos Verdes Street | San Pedro, CA 90731 310.732.3675

California Air Resources Board Page -2-

The Ports are actively collaborating with the maritime industry, including shipping lines and fuel suppliers, on the deployment of alternative fuels for vessels in California through implementation of two Green Shipping Corridors (GSC):

Ports of Los Angeles, Long Beach, and Shanghai GSC

The Port of Los Angeles, the Port of Long Beach, and the Shanghai Municipal Transportation Commission (SMTC) with support from the C40 Cities Climate Leadership Group, aim to decarbonize goods movement between the largest ports in the United States and China, on one of the world's busiest container shipping routes. Participating partners include the City of Los Angeles, A.P. Moller - Maersk, CMA CGM, Shanghai International Ports Group (SIPG), COSCO Shipping Lines, Ocean Network Express (ONE), Evergreen, China Classification Society (CCS), and the Maritime Technology Cooperation Centre (MTCC) – Asia. In September 2023 during the North Bund Forum in Shanghai, the partners unveiled the Green Shipping Corridor Implementation Plan (GSCIP) Outline which details the scope of the GSC, key definitions used by the partnership, as well as its goals. As part of the historic plan, the carrier partners committed to begin deploying reduced or zero lifecycle carbon capable ships on the corridor by 2025, and to work together to demonstrate by 2030 the feasibility of deploying the world's first zero lifecycle carbon emission container ship(s). Participants of the GSC partnership also committed to taking steps to reduce carbon emissions and harmful pollutant emissions impacting air quality, through methods such as expanding the use of shore power and supporting the development of clean marine fueling infrastructure.

Ports of Los Angeles and Long Beach, and Maritime and Port Authority of Singapore (MPA) GSC

 The Port of Los Angeles, the Port of Long Beach, and MPA with support from the C40 Cities Climate Leadership Group, aim to accelerate decarbonization of the maritime industry and the development and deployment of digital technology solutions and enablers. Spanning 14,000km across the Pacific Ocean, the GSC between Singapore and the San Pedro Bay port complex will support the development and uptake of low- and zero-carbon fuels and vessels and identify digital and technology solutions to enhance voyage and route optimization. The vision of this GSC is communicated through the Los Angeles-Long Beach-Singapore Green and Digital Shipping Corridor Partnership Strategy. Further, a comprehensive baselining study, commissioned by C40 Cities and the ports, and conducted





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by the American Bureau of Shipping, provides a baseline of activities and energy demand requirements for vessels operating on the corridor through 2050. The study estimates the quantity of near-zero and zero-emission fuels required for this traffic by modelling the adoption of zero and near-zero carbon alternative fuels by vessels operating on the corridor, considering various parameters such as fuel production costs and fuel availability, and the targets in the 2023 International Maritime Organization's Strategy on Reduction of Greenhouse Gas Emissions from Ships.

Additionally, the Port of Long Beach is preparing to release a Clean Fuels White Paper that articulates the advantages and disadvantages of different alternative fuels, and opportunities to advance the availability and use of cleaner fuels for ships in the coming months. This paper will be shared broadly with GSC partners, regulatory agencies including CARB, and the public.

191.1 This comment letter focuses on the role that methanol can play in immediately reducing emissions from vessels given the significant interest from carriers partnering on these two GSCs, the relative ease of methanol handling, and the already significant investment in vessels that can utilize this fuel. Methanol is compatible with modified 2- and 4-stroke marine engines and is already being used by over 20 large ocean-going vessels, highlighting its viability in the maritime sector. From a cost perspective, green methanol production is significantly higher than Marine Gas Oil, primarily due to its lower energy density (requiring larger fuel tanks) and production costs. The cost ranges from \$700-\$800/mt for bio-methanol to \$1100-\$1400/mt for electrolysis-based methanol, making it 3 to 4 times more expensive than current fossil fuel alternatives. Price parity with fossil fuels is uncertain without significant incentives and further regulation. Notably, MPA, a critical partner on our Singapore GSC, is developing a Technical Reference for methanol bunkering that can be leveraged by the two Ports to support bunkering in California.

The carbon intensity of methanol varies widely based on the production source. Methanol from coal has the highest carbon intensity, while e-methanol produced with hydrogen recycling exhibits the lowest carbon intensity. E-methanol is produced through electrolysis by splitting water to create hydrogen, which is then reacted with carbon dioxide (methanation) to produce methanol.

HIF Global and the industry partners referenced at the beginning of this letter have been advocating for regulatory language that would allow e-methanol to generate LCFS credits when used in marine operations in the most recent rulemaking for amendments to the LCFS program. We support their advocacy and their letter submitted to the regulatory docket. The Ports understand





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California Air Resources Board Page -4-

that CARB is about to complete the currently pending rulemaking amendments. Given the significantly greater cost of e-methanol and other alternative fuels compared to conventional maritime fuels, and the urgent need for emission reductions from vessels, we strongly encourage CARB staff to request approval to proceed with a new regulatory amendment to the LCFS program under Section 95482 at the November 8, 2024 Board hearing. The amendment should at a minimum seek to incorporate e-methanol into the LCFS program. This recommendation aligns with the comment letter submitted by HIF Global and our other industry partners as part of the open LCFS regulatory amendment process.

The Ports appreciate your consideration of these comments. Please contact us at Morgan.Caswell@polb.com or MGalvin@Portla.org should you wish to discuss this letter.

Sincerely,

Heales Dog

Heather Tomley Managing Director of Planning and Environmental Affairs Port of Long Beach

Wichard DiBornando

Michael DiBernardo Deputy Executive Director Marketing and Customer Relations Port of Los Angeles





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October 16, 2024

Chair Liane Randolph California Air Resources Board 1001 | Street Sacramento, CA 95814

Re: Comments on the October 1st 15-day Package

Submitted via email with attachments: cotb@arb.ca.gov

Dear Chair Randolph and members of the 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 second 15-day package (2nd 15-day Notice) that was published on October 1, 2024. 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. We have been strong partners with California in its long-term efforts to decarbonize its transportation sector, with its vast portfolio of policies, regulations and incentives that target high priority zero emission technologies and the hugely successful Low Carbon Fuel Standards - the hallmark policy that champions a market-based approach to decarbonizing transportation fuels by being science-driven, fuel-neutral, technology-agnostic, and performance-based. CARB set out a lofty goal to reduce GHG emissions and the members of Clean Fuels and CABA responded swiftly and overwhelmingly to that call...with innovation and investment throughout the supply chain.

Overview

On October 1, 2024, CARB released a second 15-day package that included new proposed amendments to the LCFS following earlier proposals released in December 2023 (the Initial Statement of Reason) and August 2024 (1st 15-day notice).

¹ Clean Fuels Alliance America (Clean Fuels) is the U.S. trade association representing the entire biodiesel, renewable diesel, and sustainable aviation fuel supply chains including producers, feedstock suppliers, and fuel distributors serving the on- and off-road applications, rail, marine, and heating oil markets. Made from an increasingly diverse mix of resources such as recycled cooking oil, soybean oil, and animal fats, the clean fuels industry is a proven, integral part of America's clean energy future.

² California Advanced Biofuels Alliance is a not-for-profit trade association promoting the increased use and production of advanced biofuels in California. CABA represents biomass-based diesel (BMBD) feedstock suppliers, producers, distributors, retailers, and fleets on state and federal legislative and regulatory issues.

Our comments submitted on <u>February 20, 2024 on the Initial Statement of Reason</u> focused on the provisions to:

- 192.11)Strengthen the CI reduction targets.
- 192.2 2) Introduce sustainability provisions for crop-based biofuels and the lack of muchneeded updates to the indirect land use change model (GTAP).
 192.3 3) Demonstration for familiat fuel.
 - 3) Remove the exemption for fossil jet fuel.

Our comments submitted on <u>August 27, 2024 on the first 15-day notice</u> focused on our:

- 192.4 1) Strong support of the proposed carbon intensity (CI) targets.
- 192.5
 2) Strong opposition to the proposed 20% limit on credit generation from biodiesel and renewable diesel made from soybean and canola oil.
- 192.6
 3) Continued concern over the sustainability provisions and CARB's unwillingness to update GTAP over the past decade despite our repeated requests.

To the extent our comments noted above have not been addressed in this rulemaking, our comments remain in effect and the above comment letters are incorporated herein by reference.

The 2nd 15-day Notice

The Second Notice of Public Availability of Modified Text and Availability of Additional Documents and/or Information for the Proposed Low Carbon Fuel Standard Amendments (2nd Notice) proposed further changes – most notably to Section 95482(i) (Fuels Subject to Regulation):

"Biomass-based diesel produced from soybean oil, canola oil, and sunflower oil is eligible for LCFS credits for up to twenty percent combined of total biomass-based diesel annual production reporting, by company, based on the following transaction types: production in California, produced for import, and import. Any reported quantities of biomass-based diesel produced from soybean oil, canola oil, and sunflower oil in excess of twenty percent on a company-wide basis will be assigned a carbon intensity equivalent to the carbon intensity benchmark shown in Table 2 in Section 95484(e) for the applicable data reporting year, or the certified carbon intensity for the associated fuel pathway – whichever is greater. For companies which have submitted a biomass-based diesel pathway certification application under CA-GREET3.0 or which have a certified biomass-based diesel pathway prior to the effective date of this regulation, this provision takes effect beginning January 1, 2028."

^{192.7} While the proposals in the 2nd 15-day notice are an improvement from the 1st 15-day notice, Clean Fuels and CABA remain highly concerned over the continued presence of limitations in both 15-day notices applied to credit generation from agricultural lipid feedstocks. We continue to question the absence of any technical or scientific reason for needing a limit or the proposed timeline, especially when such a limit has not been shown as warranted by the only land use change (LUC) modeling tool permitted under the LCFS regulation, Purdue

- 192.7 Cont. University's Global Trade Analysis Project (GTAP). We feel strongly that the CI targets should continue to be the primary method to decide which fuels participate in the LCFS and that the continuation of a fuel-neutral approach to the LCFS is imperative to maintain and improve upon its success; picking winners and losers will only distort the clean fuels market.
- Additionally, by limiting the use of certain biofuels from participating in the LCFS, CARB's own analysis showed that more GHGs and other pollutants would be emitted, leading to higher health costs.³ The analysis also found that there would not be sufficient credits available to comply with the CI targets, which would lead to higher costs to comply with the LCFS which would be passed on to fuel consumers.

Implementing the proposals in the 2nd 15-day notice will also:

- Substantially constrain the supply of feedstocks needed to provide California with lower carbon options, leading to the return of fossil diesel as discussed by CARB staff at their April 10, 2024 workshop.
 - Delay decarbonization for every 5 years of delay, 13 times more emissions reductions will be required to have the same climate impact⁴.
 - Work against efforts to promote sustainable and climate smart farming practices under development by the agricultural community.
 - 192.10 We also raise concerns about the rationale behind setting an arbitrary limit on credit generation from feedstocks grown predominantly outside California. The affected feedstocks, including soybean oil, canola oil, and sunflower oil, are mostly produced in the Midwest and are not a primary resource for California's biodiesel or renewable diesel producers, who rely more heavily on waste lipids. Notably, there isn't even a certified fuel pathway for sunflower oil, which is mainly produced in states like North and South Dakota, Minnesota, Texas, and Nebraska, all of which are also key producers of soy and canola. Instead of focusing the credit limit on feedstocks from "high risk" non-North American regions, as suggested in the Staff Report, the proposal extends the limit to all crop-based feedstocks, including those grown in North America. This is done without clear evidence of significant land use change in North America due to the LCFS.

By removing the proposed credit limits or applying them in a rational, targeted manner towards regions that are "high risk" for land conversion, CARB can help ensure that the rules governing the LCFS are both practical and conducive to market stability, thereby encouraging continued investment in clean energy technologies.

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

⁴ Joos et al, Carbon dioxide and climate impulse response functions for the computation of greenhouse gas metrics: a multi-model analysis, <u>acp-13-2793-2013.pdf (copernicus.org)</u>.

- Specific to the proposed language in Section 95482(i), Clean Fuels and CABA supports modifying the credit limit or implementing it so that it applies only to non-North American
 crop-based feedstocks. We also support pushing back the effective date of the credit
- limitation to 2028 which gives industry the time it needs to adjust to these provisions.
 192.13 Further, we support the removal of 2023 reported data being used to determine when the
- 192.14 credit limitation becomes effective, which is arbitrary and without technical merit. We also support the addition that fuel pathway applications submitted prior to the effective date of the regulation be included in the credit limitation as it provides additional flexibility to the industry as it plans for the future.

Clean Fuels and CABA also understands that CARB has had discussions with the US Department of Agriculture (USDA) on many issues related to domestic feedstock production. We encourage CARB to strengthen its collaboration with the USDA to address critical issues related to feedstock production and climate-smart agricultural practices. Given the USDA's expertise and initiatives in promoting sustainable farming and climate resilience, working closely with them could help enhance the sustainability of feedstock production while ensuring the continued growth of renewable fuels. A partnership between CARB and the USDA could also provide greater alignment on practices that reduce carbon emissions, improve soil health, and support rural economies, creating a more cohesive national strategy toward cleaner fuel pathways.

192.15 <u>Recommendation</u>

Clean Fuels and CABA recommend that the limits on credit generation in section 95482(i) and the sustainability provisions in section 95488.9(g) be modified to only apply to non-North American agricultural lipid feedstocks, with the credit limit to be applied as follows: 50% in 2028 and 25% in 2031. Alternatively, we recommend the Board direct the Executive Officer (using their enforcement discretion authority) to apply the credit limit only to non-North American agricultural lipid feedstocks.

- Our recommendation aligns with the fact that feedstocks grown in North America for compliance with the federal Renewable Fuel Standard and/or the Canadian Clean Fuel Regulations already meet rigorous sustainability requirements, including strong anti-deforestation and other measures to prohibit or limit cultivated land expansion and conversion.
- CARB staff also introduced at the April 10th workshop the concept that a higher land use change values (than those contained in Table 6) can be assigned to a high-risk feedstock. By corollary, we can infer that some feedstocks should be considered low-risk, such as North American agricultural lipid feedstocks, because of the aforementioned requirements. Simply put, neither the credit limitation nor the sustainability provisions should apply to low-risk feedstocks because they have already implemented, attested to, and been verified as meeting the exact conditions that address the sustainability concerns raised by CARB.

192.15
 The 50% credit limitation by 2028 is recommended as an intermediate step for pathway holders using non-North American agricultural lipid feedstocks to adjust their contracts. The 25% credit limitation by 2031 is recommended to coincide with the requirement to obtain a full certification for the sustainability provisions, which is a significant decision point in the regulation.

<u>Summary</u>

192.16

Clean Fuels and CABA strongly supports the proposed CI targets and Automatic Acceleration Mechanism and encourages the Board to adopt the proposed changes to the LCFS, including our recommendations stated above, at its November 8th Board meeting.

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 to collaborate with CARB staff.

Sincerely,

Cory-Ann Wind

Cory-Ann Wind Director of State Regulatory Affairs Clean Fuels Alliance America

1 States

Carlos Gutierrez Executive Director California Advanced Biofuels Alliance




October 16, 2024

Honorable Chair Liane Randolph and Honorable Board Members California Air Resources Board 1001 | Street P.O. Box 2815 Sacramento, CA 95812

Re: SUPPORT Proposed Second 15-day Change Amendments to the Low Carbon Fuel Standard Regulation

Submitted to https://ww2.arb.ca.gov/applications/public-comments

Dear Chair Randolph and Honorable Board Members:

The Electric Vehicle Charging Association (EVCA) and CalETC appreciate this opportunity to SUPPORT the Low Carbon Fuel Standard (LCFS) regulation and provide feedback for the California Air Resources Board (CARB) Board member consideration. This letter largely supports the proposed draft regulation order ("draft order") dated August 12, 2024, version ("15-day changes") with the additional October 1, 2024, modifications (second 15-day changes). We also appreciate the tremendous effort and accessibility of CARB staff during the extensive public process leading up to this hearing. We believe that a few remaining implementation issues on verification for electricity can be worked out in a future guidance document, a workshop or FAQ for verifiers and positive statements in the Final Statement of Reasons.

EVCA is a not-for-profit trade organization of twenty leading EV charging industry member companies and two zero-emission autonomous fleet operators. The association was established in 2015 to comprehensively represent the entire EV charging value chain and provide a collective industry voice for decision makers.

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, the Northern California Power Agency, 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.

Over the past 10 years, the LCFS has been tremendously successful in supporting the transition from petroleum to cleaner transportation fuels including electric fuel. Clean low-carbon fuels have replaced a percentage of petroleum and, in doing so, have reduced climate change pollutants as well as a myriad of air and toxic pollutants that adversely impact communities. LCFS has served as a catalyst for billions of dollars of investments in clean fuels and infrastructure. We have been participating in staff workshops for several years and have had several constructive conversations with staff in that time. We very much appreciate their accessibility and commitment to LCFS.

- 193.1 A large and diverse coalition of EV industry stakeholders supports LCFS. In March 2024, twentyeight stakeholders including EVCA and CalETC sent a letter to Governor Newsom supporting the LCFS as proposed in January 2024. See appendix A. Since that time, the EV provisions in LCFS have only improved.
- 193.2 We support the Fast Charging Infrastructure (FCI) programs in LCFS. In the first and second 15day changes, the FCI programs for light- and medium-duty direct current fast charging (DCFC) and for heavy duty DCFC are dramatically improved. We strongly support and thank CARB for creating a workable program. The proposed FCI provisions are two well-designed programs that, like the current FCI, will be effective in helping to attract capital to build public DC fast charge stations in California by helping to de-risk investment. The FCI programs address the "chicken and egg" infrastructure problem associated with development of DCFC stations. One of its most attractive aspects is that it results in charging plazas and refueling stations being able to exit the FCI program and transition to traditional LCFS credits. Put another way, both FCI and hydrogen refueling infrastructure (HRI) capacity credits decrease over time as the utilization of the stations increases and the station generates more traditional LCFS credits. FCI credits are also critically important for supporting ongoing operating costs for fast chargers and helping enhance station reliability. With charging experience topics emerging as a state and national priority, EVCA and CalETC assert that FCI credits will be important for driving consumer confidence in EVs and charging technology – particularly at stations that have yet to achieve robust levels of utilization.

We support improvements to the verification provisions and look forward to working with CARB on implementation details. EVCA and CalETC appreciate and supports the changes proposed in the verification sections and agree with the rationale provided in the second 15-day change notice:

- 193.3 1) In subsection 95500(b)(2)(B), staff proposes to increase the threshold for verification deferral for hydrogen and electricity-based transactions from 6,000 credits to 10,000 credits.
- 193.4 2) In subsection 95500(c)(1)(E), staff proposes to delay the implementation of the verification requirement for hydrogen and electricity-based transactions by one year.
- 193.5 3) In subsection 95501(b)(3), staff proposes to clarify the site visit requirement for verification services by explicitly stating that in order to verify a Quarterly Fuel Transactions Report, a verifier must visit the central records location annually, which may be the company headquarters. When necessary, verifiers are expected to conduct risk-based site visits to fueling supply equipment (FSE) or fuel dispensing facilities

- 193.5
Cont.based on the verifiers' professional judgment, but in many cases will only need to visit
the central records facility.
- 193.6 Regarding bullet three above, we look forward to working with CARB on the details of implementation regarding risk-based site visits for meter accuracy.¹ For example we respectfully ask for additional clarity in the FSOR, a future 2025 guidance document and a workshop or FAQ to educate verifiers regarding existing meter accuracy regulations established by the California Department of Food and Agriculture's Division of Measurement Standards (DMS), the CPUC and the governing boards of POUs.² These regulations include enforcement and cover almost all private and public locations in California with very few exceptions.³

We appreciate the opportunity to comment on these important changes to the LCFS regulation. Thank you for your consideration.

Regards,

Reed Addis Governmental Affairs Electric Vehicle Charging Association

Laura Renger, Executive Director California Electric Transportation Coalition

cc: Rajinder Sahota Matthew Botill Jordan Ramalingam

¹ Per Section 95501 (b)(3) regarding site visits and in Section 95501(b) (4) regarding sampling plans and in Section 95491.2. regarding measurement accuracy and data provisions.

² Please see the August 27 and February 20 letters by EVCA-CalETC for additional details and justification.

³ From the DMS FSOR on EVSE page 29: *"If an EVSE meets the definition of a device used for commercial purposes in the law and is not included in the list of exceptions in paragraph A.2. then the Department requires it to comply with this regulation, be type approved, and periodically tested and sealed by county officials. Those phrases are only part of examples written in the ISOR to clarify that if an EVSE is not used for commercial purposes, is not owned, maintained, and operated by a public utility or municipality, or if the owner of the EVSE does not bill the purchaser for the amount of electricity dispensed to the vehicle, then it is a device exempt from the proposed requirements in NIST Handbook 44, Section 3.40." Further the DMS FSOR states: <i>"However, "commercial purposes" is a phrase defined by the legislature in BPC § 12500(e). The Department chooses to use it in this proposed regulation to harmonize it with California law."* We note that the IOUs and POUs in California have their own meter accuracy requirements. However, regarding submeters, the IOUs subject to Decision (D). 22-08-024 must use DMS rules and rely on the DMS provisions for enforcing meter accuracy.



March 12, 2024

Governor Gavin Newsom 1021 O Street, Suite 9000 Sacramento, CA 95814

Re: Support for the Low Carbon Fuel Standard

Dear Governor Newsom,

We strongly support California's commitment to reducing greenhouse gas (GHG) emissions and achieving carbon neutrality to prevent climate change and improve air quality. To that end, we applaud the light-duty zero emission vehicle (ZEV) sales requirements by the California Air Resources Board (CARB) calling for approximately 6 million ZEVs on the road by 2030 and 14 million by 2035ⁱ, as well as CARB's ZEV requirements for sales of medium-, heavy-duty, and off-road vehicles. We recognize that the state's investments in ZEVs and charging infrastructure have led to record breaking ZEV sales, ZEVs becoming a top California export, and has spurred major advances in manufacturing and job creation to support the ZEV and charging infrastructure markets. However, California still has a long way to go to reach our climate and ZEV goals, and we must utilize every tool available to achieve them. That is why we strongly support CARB's Low Carbon Fuel Standard (LCFS). CARB is currently considering substantial amendments to the LCFS that would strengthen the regulation and we believe that the adoption of a strong LCFS is critical to ensure the equitable adoption of ZEVs for all Californians.

The LCFS supports zero emission vehicle and charging infrastructure adoption. The LCFS supports both the increase in ZEV adoption and the development of charging infrastructure needed to support all

types and sizes of ZEVs.ⁱⁱ 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. The LCFS has also served as a catalyst for billions of dollars of investments in ZEVs and charging infrastructure and will continue to attract large amounts of private capital to the state. In addition, the LCFS has the added benefit of not relying on funding from either the California state budget or from California utility customers.

Under the current LCFS program, California's electric utilities invest credit proceeds in zero emissions programs. Highlights of past LCFS-funded programs include:

- Statewide California Clean Fuel Reward Program that provided rebates to over 400,000 electric vehicle customers;
- Pre-owned EV rebate programs, with increased incentives for low-income customers;
- Incentives for residential chargers and installation for low-income communities;
- Programs that directly install and fully cover the cost of chargers at multi-family residences in disadvantaged communities;
- Rebates for electric drayage truck purchases; and
- Grants to community-based non-profit organizations to promote adoption of EVs.

Under the proposed amendments to the LCFS, the electric utilities will spend almost 80% of their total credit proceeds on ZEV and charging infrastructure programs that benefit equity communities.ⁱⁱⁱ The utilities will also launch a statewide rebate program to support medium- and heavy-duty electric vehicles and will use remaining credit proceeds to support programs tailored to their service areas, building upon those highlighted above. CARB's 2022 Scoping Plan Update relies on the support for electrification that will be funded by the LCFS. Without this funding, these utility programs are not likely to exist and many low- and middle-income customers would be left behind.

LCFS programs lead to downward pressure on electric utility rates. There are many reasons why utility electric bills are going up. However, one of the few things that supports the reduction of rates or what is called downward pressure on electric rates is transportation electrification. Increasing electricity usage through transportation electrification can reduce rates for all customers because fixed capital costs are spread over more electricity sales and charging shifted to off-peak times. A Synapse/NRDC study on the downward rate pressure dynamic found:

"...that over the last decade, EV drivers in PG&E's, SCE's, and SDG&E's service territories have contributed approximately \$1.7 billion more in revenues than associated costs, driving rates down for all customers."^{iv}

Furthermore, when utilities utilize LCFS credit proceeds instead of funds from the utility rate base for transportation electrification programs, it accelerates increased usage of the electricity system and compounds the ability to create downward pressure on rates even further.

LCFS enables Californians to switch to electricity for their transportation fuel, which will help all Californians spend less money in total on their energy bills. Electrification saves customers money

by reducing their reliance on expensive fossil fuels, even when factoring for the grid upgrades needed to support electrification.^v And according to CARB's analysis, the current and proposed LCFS improves access of low-income, disadvantaged, and rural communities to ZE transportation^{vi} by making it more affordable.^{vii}

LCFS's impact on gasoline prices is overstated and market pressures from EV adoption will help lower prices at the pump. As shown in the graph below, there has been no direct, quantifiable link between quarterly LCFS prices and the price of gasoline.^{viii} While there may be impacts to retail gasoline prices from LCFS compliance, the correlation between the LCFS and gasoline prices is not nearly as significant as global macroeconomic and other factors that play a much larger role in influencing gasoline prices. It is difficult to predict how the oil industry will respond to increased stringency in LCFS with respect to consumer pricing of gasoline and diesel because the impact of increased LCFS stringency on gasoline prices is overshadowed by other factors. There are no requirements or assurances that compliance costs be put into the cost of a particular fuel, or that those costs associated with a particular fuel be recouped in the prices for that fuel, as opposed to any other fuel. Additionally, oil companies are getting much larger profits from California refineries as compared to refineries in other states, and oil companies do not have to pass on costs to consumers.^{ix} Instead, they could simply realize the profit margins they had in the past, or what they realize in other states.^x



Further, as gasoline faces increased competition from electricity and other low-carbon fuels,^{xi} experts indicate that fuel diversification of these less costly fuels puts price pressure on gasoline and diesel, further muting the impact of LCFS.^{xii} For example, an International Council on Clean Transportation study found that "oil prices will be lower in the future if low-carbon transportation technologies are mass deployed, as these technologies will drive a significant reduction in global

demand for oil."xiii Pressure from EVs and other less expensive low carbon fuels will help create a free market for transportation fuel and remove gasoline's inelastic price.

For the reasons detailed above, we strongly encourage you to support the Low Carbon Fuel Standard. Please do not hesitate to contact us if you have any questions or would like additional information.

Best,

Curt Augustine Senior Director of State Affairs Alliance for Automotive Innovation

Laura Renger Executive Director California Electric Transportation Coalition (CalETC)

Nicole Hutchinson State Policy Director CALSTART

Rocky Fernandez Director of Government Affairs Center for Sustainable Energy

A.K. Venus Jenkins Chief Executive Officer ChargeNet Stations

Terry Crowley Utility Director City of Healdsburg

Dean Batchelor Director of Utilities City of Palo Alto

Michelle Avary VP External Affairs North America Einride Reed Addis Governmental Affairs Electric Vehicle Charging Association (EVCA) Anthony Willingham Government Affairs & Public Policy Lead – State Government Electrify America

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Renee Samson Director of Public Policy FreeWire

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Simon Zewdu Senior Assistant General Manager Los Angeles Department of Water & Power (LADWP)

Lydia Krefta Director, Clean Energy Transportation Pacific Gas & Electric (PG&E)

Alexis Moch Director, Government Affairs Prologis

Frank Girardot Senior Director of Communications RIDE Mobility

Scott Davidson Chief Executive Officer Revolv

Paul Lau Chief Executive Officer Sacramento Municipal Utility District (SMUD)

Alexandria Moffat Director, Clean Transportation San Diego Gas & Electric (SDGE)

Tim McRae SVP Sustainable Growth Silicon Valley Leadership Group (SVLG)

Rosalie Barcinas Director of Electrification & Customer Services Policy Southern California Edison (SCE)

Thomas Ashley

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Apoorv Bhargava Chief Executive Officer WeaveGrid

Nicholas Raspanti Senior Director, Business Development & Policy Zeem Solutions cc: Liane Randolph Steven Cliff Rajinder Sahota Assembly Speaker Robert Rivas Senate President Pro Tempore Mike McGuire

ⁱ Calculations in comments from Natural Resources Defense Council regarding CARB's Advanced Clean Cars II regulation. May 2022. Page 5, <u>https://www.arb.ca.gov/lists/com-attach/403-accii2022-UD4GclcyUGBXDlMy.pdf</u>.

ⁱⁱ The current LCFS is a well-crafted system that allows site-hosts, automakers, charging providers and utilities to generate LCFS credits in order to accelerate charging infrastructure.

ⁱⁱⁱ Statewide average number. Includes both statewide and individual utility programs funded by LCFS.

^{iv} See Electric Vehicles Are Driving Electric Rates Down <u>https://www.synapse-energy.com/sites/default/files/EV-Impacts-December-2022-21-032.pdf</u>, p.3.

^v Comparison between five of the most popular gasoline powered models in the country and an EV equivalent for purchase March 2024, Table 1 Atlas Public Policy. <u>https://atlaspolicy.com/comparing-the-total-cost-of-ownership-of-the-most-popular-vehicles-in-the-united-states/</u>; See also <u>https://www.edison.com/our-perspective/countdown-to-2045</u>, Figure 3.

^{vi} See <u>https://ww2.arb.ca.gov/resources/documents/low-carbon-fuel-standard-sria</u> CARB LCFS regulatory package appendix C, pages 59-61.

^{vii} Ibid.

viii Derived from https://ww2.arb.ca.gov/resources/documents/lcfs-data-dashboard, Figure 4 and

https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=EMM_EPM0_PTE_SCA_DPG&f=M; see Low Carbon Fuels Standards Market Impacts and Evidence for Retail Fuel Price Effects, Bates White Economic Consultant, April 2022. Page 25, chrome-

extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.bateswhite.com/media/publication/226_BW%20LCF%20Report%20-%20April%202022.pdf.

ix https://consumerwatchdog.org/energy/profit-reports-show-oil-refiners-are-gouging-californians-profits-gallon-double/.

^x See <u>https://www.gov.ca.gov/2022/11/01/more-oil-companies-made-massive-profits-as-californians-paid-higher-gas-prices/</u> and <u>https://www.politico.com/news/2023/01/31/oil-earnings-california-newsom-00080538</u>.

xⁱ To illustrate the increase in ZEV penetration: "By 2030, UC Davis modeling predicts around 23% of total vehicles will be ZEVs, if projections hold, we (UC Davis's model) predict that the majority of the fleet will be ZEVs sometime in the mid-2030's." UC Davis letter to CARB, February 20, 2024, page 21. See <u>https://www.arb.ca.gov/lists/com-attach/7085-lcfs2024-</u> Wi9QNQNdAzRXMAF3.zip

xii Low Carbon Fuels Standards Market Impacts and Evidence for Retail Fuel Price Effects, Bates White Economic Consultant, April 2022. Page 9, <u>chrome-</u>

extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.bateswhite.com/media/publication/226_BW%20LCF%20Report%20-%20April%202022.pdf.

xiii See https://theicct.org/publication/oil-market-futures-effects-of-low-carbon-transport-policies-on-long-term-oil-prices/.



October 16, 2024

California Air Resources Board 1001 I Street Sacramento, CA 95814 *Via electronic submission:* https://ww2.arb.ca.gov/lispub/comm/bclist.php

Re: Second Notice of Public Availability of Modified Text and Availability of Additional Documents and/or Information: Proposed Low Carbon Fuel Standard Amendments

To Whom it May Concern:

Sustainable Advanced Biofuel Refiners (SABR) Coalition appreciates the opportunity to comment on the California Air Resources Board's (CARB) proposed changes to the Low Carbon Fuel Standard (LCFS) program – Second 15-Day Changes. SABR is a national biodiesel trade association made up of nearly sixty organizational members from virtually every state including California. SABR's members have invested in building out America's first advanced biofuel and include stakeholders from every link in the value chain from feedstock growers to biodiesel producers, distributors, retailers, and consumers, as well as infrastructure and products and services suppliers. Biodiesel can be produced from a range of feedstocks, including oil from numerous oilseed crops, such as soybeans, canola, and sunflowers. Members of SABR Coalition have participated in the LCFS program, including obtaining pathways for biodiesel. SABR

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SABR Coalition submitted comments on the First 15-Day Changes, which first proposed a 20% limit on credits for biomass-based diesel (e.g., biodiesel) produced from virgin soybean oil and canola oil.¹ Under the proposal, any biomass-based diesel from virgin soybean and canola oil in excess of 20% will be assessed the carbon intensity of the applicable diesel pool benchmark for the year or the certified carbon intensity of the applicable fuel pathway, whichever is higher. Rather than address the numerous concerns raised by public comments as to the lack of support and detrimental impacts of such a proposal, the Second 15-Day Changes would expand these provisions to biomass-based diesel from virgin soybean, canola, and sunflower oil. The only explanation provided is that it is consistent with the rulemaking's objective to provide guardrails on crop-based biofuels to prevent potential adverse impacts and that adding sunflower oil responds to feedback that limiting this provision to soy and canola could lead to incentives to increase use of other oilseeds for biofuel production. But, the "price premium may make it prohibitive to use sunflower oil in biodiesel."²_A This illustrates, as SABR Coalition argued in its comments, the lack of empirical evidence that the proposed limitation is necessary or warranted.

¹ SABR Coalition also supported the comments of the American Soybean Association and NATSO/SIGMA.

² National Sunflower Association, *Biodiesel*, <u>https://www.sunflowernsa.com/oil/biodiesel/</u> (last visited Oct. 13, 2024).

I. Limitations on Crop-Based Feedstocks for Biodiesel are Unwarranted.

The Initial Statement of Reasons (p. 32) simply states that guardrails are needed to "reduce the risk that rapid expansion of biofuel production and biofuel feedstock demand could result in deforestation or adverse land use change." CARB does not explain how these guardrails would operate, and land use changes are already considered in setting the carbon intensity scores, which disadvantages crop-based biodiesel under the LCFS. Citing to no real world data to explain this claimed "risk," additional guardrails are simply not warranted.

A. There is no support to impose limitations on credits for crop-based biodiesel, much less to expand those limitations to other feedstocks.

194.2 The Second 15-Day Changes continue to illustrate that CARB's proposal is not grounded in reality. As noted above, the proposed addition of sunflower oil to the feedstocks limited in the proposal does not appear to consider actual market conditions that essentially prices sunflower oil out of the biomass-based diesel market. Indeed, despite the substantial growth in biodiesel and renewable diesel production, sunflower oil has not been included (or, to our knowledge) sought to be added as an eligible feedstock under the U.S. Renewable Fuel Standard, even though there are benefits to ensuring a diversity of feedstocks to support production.

> It is unclear what support CARB is relying on to add sunflower oil, although several comments argued for a broader and more stringent limitation on biomass-based diesel volumes. These comments fail to understand the difference between biofuel feedstocks (including waste oils) and the vegetable oil market and cherry pick and misstate data to argue the LCFS will impact global demand. For example, soybeans are approximately 20% oil and 80% protein meal, and meal represents a significant source of demand for soybeans, which is largely ignored. U.S. farmers have also been able to meet increasing demand since the increase in biofuel production with the U.S. Renewable Fuel Standard. While there was a recent increase in soybean prices that some have attributed to the increased demand from renewable diesel facilities, this ignores other factors contributing to these prices that were unrelated to biofuel production and that prices have been trending down since that spike in prices.³ Nevertheless, there has been significant investments for increased U.S. capacity in crushing to meet anticipated demand, and there were record high crushes in 2024.⁴ Soybean yields and production are also forecast at record highs.⁵ And, export demand for U.S. soybeans has been below previously anticipated levels.⁶ Biodiesel has long been a market for surplus soybean oil, and there is no basis to impose such limits on biodiesel, which is discussed further below.

More important, CARB already rejected a similar recommendation from the Environmental Justice Advisory Committee (EJAC), finding that modeling of a scenario implementing their

³ Soybean Prices – 45 Year Historical Chart, Macrotrends, <u>https://www.macrotrends.net/2531/soybean-prices-historical-chart-data#google_vignette</u> (data as of Oct. 16, 2024).

⁴ USDA, Oil Crops Outlook: September 2024, at 2 (Sept. 16, 2024),

https://www.ers.usda.gov/webdocs/outlooks/110006/ocs-24i.pdf?v=3360.1.

⁵ *Id.* at 1; *see also* USDA Report Projects Record 2024 Corn and Soybean Yields, Morning AgClips, Aug. 20, 2024, https://www.morningagclips.com/usda-report-projects-record-2024-corn-and-soybean-yields/.

⁶ Karen Braun, *Recent strength in US soy sales not enough to lift export prospects*, Reuters, Sept. 20, 2024, https://www.reuters.com/markets/commodities/recent-strength-us-soy-sales-not-enough-lift-export-prospects-2024-09-20/.

recommendations would result "in higher volumes of fossil diesel being used than any of the other scenarios evaluated."⁷ Limiting the volumes would result in insufficient credits, increase costs, increase air emissions, decrease GHG emissions reductions, and decrease health benefits.⁸ CARB has properly rejected such calls and must continue to do so.

B. Imposing limitations on crop-based biodiesel would have detrimental environmental impacts rather than provide any guardrails against the concerns claimed by CARB.

While CARB rejected the arbitrary restrictions on biomass-based diesel volumes in the Second 15-Day Changes that other commenters suggested, it continues to propose a 20% limitation on certain crop-based biomass-based diesel fuels and would now expand it to include soybean oil, canola oil, and sunflower oil. Where biodiesel has long been an important outlet for supplies of excess vegetable oils, particularly soybean oil and canola oil, these limitations would have detrimental impacts on farmers. An important benefit of having this additional market is to improve the farmer's economics, which allows farmers to invest in sustainable practices and to better protect their farms from other land use pressures, including expansion of urban areas with their attendant pollution issues.⁹ Based on the most recent Census of Agriculture, "[t]he amount of farmland and number of farms in the U.S. continue to decline."¹⁰ In the meantime, use of conservation practices are increasing.¹¹ As SABR Coalition's prior comments explained, U.S. soybean farmers continue to adopt precision agricultural technologies and practices that increase productivity and yield, enhance resilience to environmental changes, and reduce GHG emissions.¹² These sustainable practices provide GHG emission reductions benefits that will be lost if crop-based fuels are unduly limited. Restricting this markets through regulation sends the

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⁷ Initial Statement of Reasons at 116; *see also* CARB, *California Low Carbon Fuel Standard Workshop*, Presentation at Slide 23, Apr. 10, 2024, <u>https://ww2.arb.ca.gov/sites/default/files/2024-</u>

^{04/}LCFS%20April%20Workshop%20Slides.pdf. The EJAC appears to have based this on one study from Europe that uses a different model than used in the U.S. EJAC Presentation, April 10, 2024 Low Carbon Fuel Standard Public Workshop. EPA recently reviewed different models and held a workshop on assessing the greenhouse gas (GHG) emissions based on land use changes, which showed a wide range of results due largely to the significant uncertainty surrounding these analysis. Even comments that support limits on crop-based biofuels recognize that "[m]ore than 14 years of research has not led to a consensus estimate of these emissions." Comments of Union of Concerned Scientists, Aug. 27, 2024, at 2. Uncertainty, however, is not a basis to impose limitations when "[r]esearch based on misclassifications of land use and flawed assumptions and methodologies spurred skepticism about the environmental and GHG emission reduction benefits of biofuels ... has since been disproven." Todd Neeley, *Scientists: RFS Land Use Claims False*, Progressive Farmer, July 8, 2024,

https://www.dtnpf.com/agriculture/web/ag/news/business-inputs/article/2024/07/08/scientists-push-court-rejectland. CARB is to rely on the best available science.

⁸ Initial Statement of Reasons at 116-124.

⁹ See, e.g., GAP Initiative, Virginia Tech College of Agriculture and Life Sciences, *America's Disappearing Farm and Range Land*, <u>https://globalagriculturalproductivity.org/case-study-post/americas-disappearing-farm-and-range-land/</u> (last visited Oct. 16, 2024).

¹⁰ Farmland Information Center, Fact Sheet, 2022 Census of Agriculture, at 2, Aug. 6, 2024, https://farmlandinfo.org/wp-content/uploads/sites/2/2024/02/census-of-ag-fact-sheet-2022.pdf.

 $[\]frac{11}{10}$ Id. at 3

¹² Kate Vaiknoras, U.S. Soybean Production Expands Since 2002 as Farmers Adopt New Practices, Technologies, USDA Economic Research Service, July 26, 2023, <u>https://www.ers.usda.gov/amber-waves/2023/july/u-s-soybean-production-expands-since-2002-as-farmers-adopt-new-practices-technologies/</u>; USDA, *Climate-Smart Agriculture and Forestry*, <u>https://www.farmers.gov/conservation/climate-smart</u> (last visited October 13, 2024).

194.3wrong policy signals, creating a disincentive to farmers to continue to innovate and further investCont.in sustainable practices. This appears to have been ignored by CARB.

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Moreover, there is simply no reason to believe that the proposed cap would serve as a guardrail at all, even with the inexplicable addition of sunflower oil. Soybean and canola oils are major feedstocks for biodiesel production, according to data from the U.S. Energy Information Administration (EIA)¹³ and the U.S. Environmental Protection Agency (EPA).¹⁴ Yet, California's feedstock breakout does not reflect this same percentage. This shows that there are already greater incentives to use waste oils for production of biomass-based diesel under the LCFS, which CARB recognized in its April 10, 2024 Workshop (Staff Presentation at slide 53, 57-59).¹⁵ This is largely because of the lower carbon intensity scores attributed to those feedstocks. This has resulted in increased imports of waste feedstocks, which can largely be attributed to the increase in renewable diesel capacity. Renewable diesel production capacity has significantly outpaced biodiesel production capacity, which has been on the decline and "now accounts for the smallest share of U.S. biofuels capacity."¹⁶ The increased stringency in the requirements would continue to incentivize waste feedstocks over crop-based feedstocks for these new renewable diesel facilities. Limiting crop-based feedstocks would only further incentivize increased imports of feedstock, which are much more difficult to verify.

Further, it simply makes no sense that a renewable fuel, such as soybean biodiesel, with all of its environmental benefits would create "deficits" because CARB will treat it essentially as fossil based diesel. This ignores the "guardrails" already in place with respect to U.S. biodiesel production. In particular, the U.S. Renewable Fuel Standard includes protections against land conversion by requiring crop-based feedstocks to come from land that was agricultural land in December of 2007. EPA has found that total agricultural land in the United States (and Canada) has remained below that in 2007. We are concerned that the "guardrails" proposed, including land certification requirements, are inconsistent with the U.S. Renewable Fuel Standard. This could create problems in enforcement and could create an obstacle to the accomplishment and execution of the federal program by restricting feedstocks that otherwise would be eligible under the U.S. Renewable Fuel Standard and thereby impact the volume of fuels that may be available to meet the federal volume requirements. This raises potential preemption concerns.

The proposed cap on crop-based biodiesel also would not be consistent with AB32 on several grounds, including requiring consideration of other environmental impacts, seeking maximum technologically feasible and cost-effective GHG emissions reductions, and using the best available science. In establishing the LCFS, CARB recognized that it would reduce GHG emissions, but also would cut "other smog-forming and toxic air pollutants," citing to reducing petroleum dependency and achieving air quality benefits as the intent of the design of the

https://ww2.arb.ca.gov/sites/default/files/2024-04/LCFS%20April%20Workshop%20Slides.pdf.

¹³ EIA, *Monthly Biofuels Capacity and Feedstocks Update*, Tables 2b and 2c, <u>https://www.eia.gov/biofuels/update/</u> (with data for July 2024).

¹⁴ EPA, *RINS Generated Transactions – Feedstock Summary Report*, <u>https://www.epa.gov/fuels-registration-reporting-and-compliance-help/rins-generated-transactions</u> (data as of Sept. 10, 2024).

 ¹⁵ Available at <u>https://ww2.arb.ca.gov/sites/default/files/2024-04/LCFS%20April%20Workshop%20Slides.pdf.</u>
 ¹⁶ See EIA, In 2023, U.S. renewable diesel production capacity surpassed biodiesel production capacity, Today in

Energy, Sept. 5, 2023, <u>https://www.eia.gov/todayinenergy/detail.php?id=60281</u>; *see also* CARB, April 10, 2024 Low Carbon Fuel Standard Public Workshop, Staff Presentation, Slide 28,

194.6 program.¹⁷ While both biodiesel and renewable diesel provide tailpipe emissions reductions
Cont. compared to petroleum diesel, biodiesel does have increased GHG emission reductions
compared to both petroleum diesel and renewable diesel, and also provides local environmental
benefits, where EPA has found environmental justice concerns with both petroleum and
renewable diesel facilities.¹⁸ Biodiesel also provides more cost-effective reductions as the more
efficiently produced and lower-cost fuel. Further, treating crop-based biodiesel as having the
same carbon intensity as the baseline diesel fuel, rather than utilizing the carbon intensity score
that was found for the specific biodiesel facility, simply has no basis in science. It further treats
biodiesel inequitably, which was to be another hallmark of the LCFS.

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Indeed, the proposed limitation on crop-based feedstocks would likely have a bigger impact on biodiesel facilities that are more likely to use one type of feedstock for all or the bulk of their production. Renewable diesel facilities, which are often converted from petroleum refineries, on average have a much larger production capacity than biodiesel facilities and, as newer facilities, are more likely to be designed to utilize multiple feedstocks. Different feedstocks have different levels of free fatty acids that can have an impact on the transesterification process, requiring different levels of pretreatment. Waste oils may also have additional impurities. Smaller biodiesel facilities may have been designed to utilize vegetable oils versus waste oils would effectively be excluded from the LCFS program. These facilities would not be able to compete with the larger renewable diesel facilities for these waste oils to justify adding pretreatment to their operations. Rather than protect against new land clearings, this would only limit existing plants that have long been in operation from participating in the LCFS program. While the Second 15-Day Changes would defer the 20% limitation for those that submitted a pathway certification application before the effective date of the regulation until January 1, 2028, this does not address the concerns that have been raised or the inconsistencies with the statute.

194.8 Thus, SABR Coalition believes the proposed changes would eliminate competition, exclude maximum technologically feasible and cost-effective GHG emissions reductions with respect to diesel fuels, and unfairly advantage larger, more pollutive renewable diesel and sustainable aviation fuel production facilities.¹⁹ This does not further the goals of the LCFS or follow the instructions of the California legislature. Where California has an outsized influence on the national market, as most renewable diesel produced in the U.S. is targeted for California, SABR Coalition requests that CARB be mindful of how biofuel regulatory measures taken by California, combined with federal regulatory measures, can create market distortions on the entire U.S. market. For example, sustainable aviation fuel produced from imported used cooking oil that comes online in California means that a gallon of soy biodiesel goes offline somewhere

¹⁷ CARB, *Low Carbon Fuel Standard – About*, <u>https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard/about</u> (last visited Oct. 13, 2024).

¹⁸ Renewable Fuel Standard (RFS) Program: Standards for 2023–2025 and Other Changes 87 Fed. Reg. 80,582, 80,617 (proposed Dec. 30, 2022).

¹⁹ See, e.g., Carlo Hamelinck et al., *Conversion Efficiencies of Fuel Pathways for Used Cooking Oil*, Final Report at 7 (2021), <u>https://www.studiogearup.com/wp-content/uploads/2021/03/2021_sGU_EWABA-and-MVaK_Options-for-the-deployment-of-UCO.pdf</u> (study comparing biodiesel, renewable diesel, co-processed renewable diesel, and sustainable aviation fuel found "that of all four pathways, [used cooking oil methyl ester] has the lowest production costs, the highest feedstock efficiency, the highest emission reduction performance and, consequently, the lowest carbon abatement costs").

else in the country. This effectively results in an increase in GHG emissions since biodiesel is the lowest cost, lowest carbon biomass-based diesel.

II. CARB Should Conduct More Analysis Before Imposing Arbitrary Limits on Biodiesel Feedstocks, Including Reconsidering its ILUC Modeling and Determinations Based on Disputed ILUC Assumptions and Recognizing the Sustainable Agricultural Practices of US Farmers.

At a minimum, based on the limited information provided to support the proposed limitation, it is clear that more analysis is required to be conducted by CARB and presented to the public for comment before a proposal limiting biodiesel feedstocks can be finalized. We found no analysis of the impacts of the proposed cap or the expansion to include sunflower oil, which has different market considerations than soybean oil and canola oil. As noted above, we believe the proposed cap would impact biodiesel producers more than renewable diesel producers, yet CARB conducted no environmental review of these potential implications.²⁰

Instead, CARB appears to be relying on unsupported or highly disputed claims of land use changes as a result of increased crop-based biomass-based diesel under the LCFS. As SABR Coalition explained in its comments on the First 15-Day Changes, modeled forecasts of emissions attributed to claimed indirect land use change (ILUC) have not been found to be accurate. "[A]nalyses based on more complete, updated data, found that the average carbon intensity of biofuels is significantly less than conventional gasoline," with this benefit "growing at an accelerated pace" as technologies and practices evolve.²¹ As the data and science has improved, CARB must continue to update its modeling, including adopting the most current version of the GTAP model, which shows significant decreases in emissions associated with land use impacts for soybeans.²²

In addition, the U.S. Department of Agriculture (USDA) has recognized numerous climate-smart agriculture and forestry mitigation activities that can help reduce GHG emissions from the agricultural sector.²³ This includes land management and restoration of disturbed lands. A scenario reviewed by CARB recognized the potential for including these practices as part of the credit generation process, but CARB did not include it in its analysis, stating there is not yet a mechanism for quantifying or verifying these practices.²⁴ Some practices, however, are already being considered as part of the Inflation Reduction Act tax credits that look at carbon intensity of fuels, such as sustainable aviation fuel. CARB should incorporate these before imposing additional (and unsupported) ILUC penalties on crop-based feedstocks for biodiesel. SABR

²⁰ In addition to providing greater GHG emissions reductions than renewable diesel, biodiesel production also uses less water and has less waste than renewable diesel production. Renewable diesel production facilities also have a larger footprint.

²¹ Todd Neeley, *Scientists: RFS Land Use Claims False*, Progressive Farmer, July 8, 2024, <u>https://www.dtnpf.com/agriculture/web/ag/news/business-inputs/article/2024/07/08/scientists-push-court-reject-land.</u>

²² See Comments of American Soybean Association, Aug. 26, 2024, at 6; Comments of SABR Coalition, Aug. 27, 2024, at 5.

²³ See, e.g., USDA Natural Resources Conservation Service, *Climate-Smart Agriculture and Forestry (CSAF) Mitigation Activities List for FY2025* (2023), <u>https://www.nrcs.usda.gov/sites/default/files/2023-10/NRCS-CSAF-</u> <u>Mitigation-Activities-List.pdf</u>.

²⁴ Initial Statement of Reasons at 125.

Coalition also urges CARB to work with USDA on those efforts and incorporate them in updated modeling.

194.11 Finally, as also explained in SABR Coalition's prior comments, "there has been more emphasis on sustainability and indirect effects of bioenergy than on baseline (often fossil fuel) scenarios. ... There needs to be equitable treatment of direct and indirect effects for any energy options being analyzed including baseline fuel(s) that would be replaced by proposed bioenergy sources."²⁵ Land use change impacts of conventional and unconventional oil production continues to be largely ignored, despite the increase in sourcing oil from unconventional sources and new wells being needed when old wells become depleted. This is compared to agricultural land in the United States continuing to trend downward with increased yields attributed to land intensification and improved agricultural practices versus clearing new lands. Unlike the lack of evidence of land use changes that can be attributed to biofuel production, there is real world and visual evidence of impacts of oil production on habitats, including sensitive ecosystems.

III. Double Counting of Indirect Emissions at the Federal and State Levels Already Restricts use of Crop-Based Feedstocks in California.

As noted above, the incentives in California already lean toward waste feedstocks for biomassbased diesel fuels, not crop-based fuels. SABR Coalition's prior comments explained the double penalties that are imposed on crop-based feedstocks, particularly soybean oil. We restate those comments here with a revision to correct a typographical error.

The re-evaluation of indirect emissions modeling for crop-based biofuels becomes especially important when the Clean Transportation Production Credit (Section 45z) goes into effect in 2025. To the extent Section 45z embraces a California-style carbon intensity scoring system in its incentive structure, it will likely apply ILUC penalties to crop-based fuels. Currently approximately half of the nation's biodiesel and renewable diesel fuels (and nearly all the nation's sustainable aviation fuel) are sold in California or one of the other states that have embraced a California-style LCFS state program.

Under the current expected approach, a gallon of biodiesel from soybean oil will have an ILUC penalty of 10 g/MJ of CO₂ for assumed land conversion (for which there is no conclusive scientific evidence) assigned at the federal level. If that same gallon is consumed in California, the same 10 g/MJ ILUC penalty is applied again to the same gallon under the LCFS, as if the gallon was burned twice and the same land was converted twice. The combination of the federal 45z and California LCFS will have assigned 20 g/MJ of CO2.²⁶ And this is the best-case scenario assuming that CARB updates its version of the GTAP-BIO model, which it has not indicated a willingness to do. If it does not, CARB will assign an ILUC penalty of 29.1 g/MJ of CO2, making a total combined ILUC penalty of 39.1 g/MJ on the gallon of soy biodiesel that is applied against the combined value stack of credits. This is nearly four times the amount of ILUC penalty that the GREET model has forecasted that a gallon of soy biodiesel should be assigned.

 ²⁵ ISO PC 248 Working Group 4 Report on Indirect Effects at 2 (2012).
 ²⁶ A gallon of biodiesel contains approximately 125 MJ of energy. https://indico.ictp.it/event/8008/session/3/contribution/23/material/slides/2.pdf.

When in reality there is no solidly consistent scientific evidence that the gallon of soy biodiesel will ever cause any land conversion.

194.12 This double (or rather, quadruple) counting is already happening today with SAF under the federal SAF credit (40B) combined with the California LCFS. Such a flawed policy is already leading to an alarming spike in questionable used cooking oil imports from China into California. These imports are displacing soybean oil, our nation's most abundant and sustainable agricultural feedstock. This outcome results in bad carbon policy, as well as bad agricultural, energy, trade, and economic policy. All of these factors make it critical that flawed indirect emissions modeling be re-evaluated using current science and actual scientific evidence. This reconsideration should rely on the hindsight of 20 years of data-gathering and actual science rather than relying on future forecasts, failed theories, flawed assumptions, and outdated data. There has been twenty years to prove the theory that land use change would be caused by US crop-based fuels, but there is more evidence to the contrary.

CONCLUSION

- 194.13 SABR Coalition again expresses its opposition to CARB's proposal to cap crop-based feedstocks for biodiesel production in the LCFS program. Any claimed risk of increased use of crop-based feedstocks for biodiesel has not been established for soybean or canola oils, much less to expand it to sunflower oil (or any additional feedstocks). Indeed, real world data and *science* indicates that claimed risk of deforestation and adverse land use change cannot be attributed to biodiesel production as a result of the LCFS. In fact, there is reason to believe such a limitation would increase GHG emissions and other environmental harms as a result of lost biodiesel volumes.
- 194.14 While we believe the carbon intensity scores already address potential land use changes, we continue to believe, even there, they are significantly overstated. Thus, SABR Coalition again urges CARB to reconsider its approach to ILUC modeling methods. At a minimum, CARB must use the most recent version of GTAP-BIO it uses to measure indirect emissions of crop-based biofuels. It should use the most current data available before it attempts to impose restrictions on biodiesel that can be used to meet the LCFS targets. Biodiesel is a cost-effective, low-carbon fuel that can be used to reduce GHG emissions.
- 194.15 As noted above, SABR Coalition supports the comments of the American Soybean Association, particularly with respect to the sustainability and certification requirements in the proposal.

We appreciate the opportunity to comment on these important policy matters. We thank you for your work and look forward to working with you going forward to help the LCFS realize its important carbon reduction goals. Please contact me if you have any questions.

Sincerely, Juph Abr

Joe Jobe, CEO Sustainable Advanced Biofuel Refiners Coalition joe@rockhouse.us 573.680.1948



Tanya M. DeRivi Senior Director, California Climate and Fuels

October 16, 2024

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

Uploaded at: https://ww2.arb.ca.gov/applications/ public-comments

Re: WSPA Comments on Second 15-Day Low Carbon Fuel Standard Amendments Package

Dear Chair Randolph and Members of the Board,

The Western States Petroleum Association (WSPA) appreciates the opportunity to comment on the California Air Resources Board's (CARB or Agency) proposed second "15-day" Low Carbon Fuel Standard (LCFS) program amendments. 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.

WSPA is proud of the technological advancements our member companies have made in bringing more alternative fuels and electricity to California's transportation market since the LCFS came into effect. We believe a well-designed LCFS program that protects a diverse energy portfolio is essential to supporting a healthy lower-carbon fuels market. It remains essential for CARB to adopt final revisions that align with statutory requirements and that are implementable and achievable, while offering Californians a reliable supply of affordable lower-carbon fuels to build on the program's success.

As discussed in more detail below, WSPA highlights the following key issues with CARB's 15-day amendment proposals:

- 1) CARB must ensure that any revised reduction targets are cost-effective and feasible.
- 2) An expansive biofuel cap is arbitrary and would compromise the availability of lower-carbon fuels and interfere with the development of alternative fuel pathways.
- 3) The biofuel sustainability guardrails remain unnecessary and would impose arbitrary restrictions on biomass-based fuel pathway compliance. These amendments will likely compromise access to ethanol – which has *limited-to-no substitutes* for E10 (or E15) gasoline.
- 4) The newly proposed arbitrary and ambiguous requirement to limit LCFS crediting to hydrogen that is at least 80% renewable starting in 2030, combined with the prohibition of hydrogen produced from fossil gas from generating credits beginning in 2035, will add complexity, limit cost-effective decarbonization options, and will likely create market uncertainty for hydrogen suppliers in the future. WSPA opposes these provisions.
- 5) Proposed changes to the Automatic Acceleration Mechanism (AAM) should be clarified. WSPA supports reverting to use of calendar year-based data.
- 6) CARB needs to properly account for reduced Land Use Change.
- 7) Additional flexibility is needed for validation and verification services.
- 8) Further changes to Zero Emission Vehicle (ZEV) crediting provisions are concerning as marketbased programs should continue to preserve consumer choice by providing a level playing field for all technologies.
- 9) Changes to crediting periods for avoided methane crediting for dairy and swine manure pathways are concerning given the historically lengthy certification process. We urge CARB to

use the date of the first pipeline injection to determine whether pathways are granted for two or three consecutive 10-year crediting periods.

WSPA has been engaged throughout this LCFS rulemaking process and previously submitted comments in response to prior workshops, proposed regulatory updates, and the recirculated environmental analysis. Those comments are incorporated by reference and are also attached. 1,2,3,4,5,6,7,8,9,10

1. A 9% Step-Down in 2025 Compromises LCFS Program Cost-Effectiveness and Feasibility.

CARB is required, pursuant to Health and Safety Code (HSC) §§ 38560 and 43018, to ensure that its program amendments are cost-effective by accounting for technological feasibility and necessity. 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."¹¹ To comply with these provisions, WSPA urges CARB to revise its proposed program amendments to create a more cost-effective, technology-neutral, and less burdensome regulatory program that protects a diverse energy portfolio, including for fuels that are contributing to significant emission reductions efforts today.

195.1 As WSPA has explained in previous comments, super-accelerating the carbon intensity (CI) "step down" target in 2025 by 9% will likely increase consumer cost impacts and disincentivize longerterm advancements in developing lower-CI transportation fuels. This may compromise CARB's efforts to balance program costs with emission reductions. The State has repeatedly acknowledged^{12,13,14} that LCFS has a direct cost impact on California consumers, which can disproportionately burden low- and moderate-income Californians. Rather than super-accelerating reductions, CARB should adopt more feasible CI reduction targets to mitigate potentially significant consumer cost impacts and encourage longer-term advancements in lower-CI transportation fuel development.

2. CARB Should Retain Flexibility for Biofuel and Crop-Based Feedstocks.

Rather than address significant concerns raised by WSPA and other commenters, CARB's proposed 15-day updates exacerbate existing burdens for biomass-based fuels. These proposed

⁹ WSPA, "WSPA Comments on 15-Day Low Carbon Fuel Standard (LCFS) Amendments Package," August 27, 2024.

11 HSC § 38562.

¹ WSPA, "WSPA Comments on CARB Workshop to Discuss Potential Changes to the LCFS," August 8, 2022.

 ² WSPA, "WSPA Comments on the August 18th CARB Workshop to Discuss Potential Changes to the LCFS," September 19, 2022.
 ³ WSPA, "WSPA Comments on the November 9th CARB Workshop regarding Potential Changes to LCFS," December 21, 2022.

⁴ 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.

⁵ WSPÁ, "WSPA Comments on CARB's Proposed Low Carbon Fuel Standard Auto-Acceleration Mechanism and May 23, 2023 Workshop," June 6, 2023.

⁶ WSPA, "WSPA Comments on the Low Carbon Fuel Standard Modeling Updates Workshop," September 12, 2023.

⁷ WSPA, "WSPA Comments on Proposed 2024 Low Carbon Fuels Standard Amendments," February 20, 2024.

⁸ WSPA, "WSPA Comments on April 10, 2024, Low Carbon Fuel Standard Workshop," May 10, 2024.

¹⁰ WSPA, "WSPA Comments on LCFS Recirculated Draft Environmental Impact Analysis," September 30, 2024.

¹² CARB, LCFS 2023 Amendments, Standardized Regulatory Impact Assessment, September 8, 2023 at 58, https://dof.ca.gov/wpcontent/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.).

¹³ 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.

¹⁴ See CEC, Senate Bill (SB) X1-2 Refiner Margin Data at https://www.energy.ca.gov/data-reports/energy-almanac/californiaspetroleum-market/california-oil-refinery-cost-disclosure.

updates would expand the applicability of the 20% cap on biomass-based fuels to include sunflower oil feedstocks and would impose even more onerous requirements for the sustainability guardrails. As WSPA has previously explained, these requirements will limit proven emission reduction strategies that are effective *today* while disincentivizing additional investments in lower carbon renewable fuels by increasing costs to produce and deploy lower-CI transportation fuels for California's consumers.

CARB should remove the proposed 20% cap on biomass-based fuels:

- Limiting biofuel production would interfere with CARB's emission reduction goals. State agencies have repeatedly acknowledged that California's demand for liquid fuels will continue through at least 2045.^{15,16,17} Biofuel production provides an important supply of lower-carbon fuel to meet this remaining demand. However, a biofuel cap would limit the supply of lower-carbon liquid fuels by reducing production incentives. Without an adequate supply of lower-carbon alternatives, Californians would be forced to turn to more traditional, higher-CI liquid fuels, and therefore, a cap may *increase* statewide transportation emissions.
- The biofuel cap conflicts with CARB's regulatory mandates under the Health & Safety Code. As described above, by limiting the supply of lower-carbon biofuels to meet the remaining demand for liquid fuels, the proposed biofuel cap may *increase* emissions. Therefore, this proposal conflicts with CARB's mandate, pursuant to HSC § 38560, to adopt measures "to achieve the maximum technologically feasible and cost-effective greenhouse gas emission reductions from sources."¹⁸ The proposed cap may also conflict with HSC § 38562's requirement to consider "diversification of energy sources, and other benefits to the economy, environment, and public."
- The biofuel cap may violate the Dormant Commerce Clause. By restricting the quantity of fuel a given company produces, CARB's proposal impacts the instrumentalities of interstate transportation and may impermissibly impede the flow of interstate commerce in violation of the Dormant Commerce Clause.¹⁹ Instead, CARB should allow annual benchmarks and CI scores to drive the selection of feedstocks in a market-based program.

If CARB retains the arbitrary cap on biomass-based fuels, the Agency should, at a minimum, incorporate the following revisions to mitigate some of the harms associated with this provision:

- Clarify that exports from California should not be included in volumes subject to the cap. Export transactions should therefore be subtracted from the 20% volumetric obligation.
 CARB should also facilitate and expedite the review and certification of fuel pathways for
 - CARB should also facilitate and expedite the review and certification of fuel pathways for biomass-based diesel produced from specified source feedstocks such as used cooking oil, tallow, and distiller's corn oil, and refrain from imposing arbitrary and burdensome requirements for these pathways as these feedstocks will likely become increasingly important to the supply of lower carbon fuels to California.
- 195.7 The compliance volume should be based on an annual calendar year to align with other compliance requirements in the LCFS program. For example, the first quarter could have a higher than 20% vegetable oil with no LCFS credit penalty as long as the remaining quarters of the year and the first quarter average 20% or less. WSPA also recommends that CARB publish guidance addressing how and when credits for annual volumes in excess of the cap will be

¹⁵ CARB 2022 Scoping Plan Update, pgs. 86, 100: https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf

 ¹⁶ CEC Transportation Fuels Assessment, pgs. 1, 9, 22 at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-SB-02
 ¹⁷ CARB, April 10, 2024, California Low Carbon Fuel Standard Workshop at slide 38: https://ww2.arb.ca.gov/sites/default/files/2024-

^{04/}LCFS%20April%20Workshop%20Slides.pdf

¹⁸ See also HSC § 43018.

¹⁹ *Pike v. Bruce Church, Inc.*, 397 U.S. 137, 142 (1970).

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195.7 Cont.

retired to allow market participants sufficient time to prepare.

- 3. CARB Should either Remove the Sustainability Guardrails or Substantially Modify Requirements in Order to Limit Burdens to Biofuel Producers.
- 195.8 CARB's proposal to impose "sustainability guardrails" may limit the supply of crop-based feedstocks used in the production of biofuels while imposing resource-intensive verification processes. This would likely increase costs associated with biofuel production. WSPA continues to have concerns about the proposed sustainability guardrails and the impacts they will have on biofuel producers and consumers.
- 195.9 The sustainability guardrails will compromise California's access to ethanol. CARB's proposed 15-day amendments would explicitly include ethanol in the sustainability guardrail requirements under § 95488.9(g)(4), despite significant concerns raised by WSPA and other commenters. Nearly all gasoline sold in California today includes blends of up to 10% ethanol by volume, which has resulted in significant reductions in CI for liquid fuels. Ethanol is an essential component of the State's efforts to reduce greenhouse gas (GHG) emissions from gasoline, which has limited-to-no substitutes. Despite the importance of ethanol to California's emission reduction goals. CARB's proposed feedstock limitations would increase the risk of a supply shortage for ethanol by imposing significant new cost burdens on ethanol production and limiting industry's ability to import ethanol into California, thus disincentivizing ethanol development and potentially *increasing* emissions from liquid fuels. Therefore, these measures 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" and would run counter to CARB's ongoing efforts - and the State Legislature's recent interest in – the evaluation of potential future approval of E15 blends.
- The sustainability guardrails are unnecessary and duplicative. CARB has yet to provide data demonstrating that there is a sustainability issue that must be addressed²⁰ and has not adequately considered that placing a limit on crop-based feedstocks for biomass-based fuels to California's transportation fuels market could potentially increase costs for California consumers. WSPA reiterates that existing LCFS program measures and related Federal programs provide sufficient guardrails to address potential land use changes associated with crop-based feedstocks that are of unsubstantiated concern. In addition, having both a cap and guardrails is duplicative; CARB previously determined that the guardrails would effectively address any remaining risks without the need for a cap.²¹

If CARB retains the sustainability guardrails, the Agency should substantially modify the requirements in order to limit burdens to biofuel producers:

Overly Broad Attestation Language Should Be Narrowed. CARB's revised language in § 95488.9(g) broadens the biomass attestation letter requirements for fuel pathway holders and applicants, requiring these participants to attest that "...all forest derived biomass was cultivated and harvested in accordance with all local, State, and federal rules and permits." This additional language potentially exposes the fuel supplier to excessive liability that is best placed with the biomass provider. Particularly if the fuel supplier does not possess this information.

²⁰ 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.").

²¹ CARB, April 10, 2024, California Low Carbon Fuel Standard Workshop at slide 40: https://ww2.arb.ca.gov/sites/default/files/2024-04/LCFS%20April%20Workshop%20Slides.pdf; 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.

- Overly Burdensome Geographical Shapefile Requirements Should Be Removed. Similarly, the new requirement in § 95488.9(g), that a pathway holder must submit "geographical shapefiles or coordinates of plot boundaries (farm, plantation or forest) that are managed to produce the forest derived biomass" in each annual reporting year, in addition to an attestation letter requirement, is overly burdensome -- particularly if they do not possess this information. There is no requirement in any U.S. or Canada renewable or lower-carbon fuel program today for mapping U.S. and Canada farms, which makes § 95488.9(g)(5) particularly problematic.
- Certification Requirements for Process Energy Should Be Removed. It is unclear how this requirement would be tracked, much less certified, by renewable fuel producers. As a result, this requirement would unnecessarily further complicate pathway review and approval as well as disrupt and possibly restrict the supply of renewable fuels into California. At a minimum, CARB should provide greater clarity on how this requirement would be implemented.
- Guardrails Should Align Regulatory Language with International Certification Schemes. WSPA appreciates CARB's recognition of Canada's Clean Fuel Regulation by discussing revisions to § 95488.9(g)(7)(H) in the Second Notice of Public Availability of Modified Text and Availability of Additional Documents, which explains that "[t]he addition specifies that CARB may modify certifications if appropriate for consistency with the removal or suspension of certification systems in other programs such as the European Union Renewable Energy Directive, or Environment and Climate Change Canada's Clean Fuels Regulations." However, it does not appear that these revisions were incorporated into CARB's regulatory text in the proposed second 15-day regulatory text. We urge CARB to correct this apparent oversight.
- 195.15 In summary, WSPA opposes arbitrary caps and additional "guardrails" that will create an unnecessary burden for transportation fuel producers and may impact the availability of alternative transportation fuels for California consumers. Further, it is unnecessary to include both in the program, given that the sustainability guardrails were introduced as a substitute for a feedstock cap.

4. CARB Should Apply a Technology-Neutral Approach to Hydrogen Usage.

WSPA opposes CARB's proposal in § 95482(h) to arbitrarily limit crediting for hydrogen to hydrogen that is at least 80% renewable beginning in 2030 and then entirely prohibiting hydrogen produced from fossil gas feedstocks beginning in 2035. Importantly, this provision would prohibit lower-carbon hydrogen production using carbon capture and sequestration (CCS) from LCFS credit eligibility.

CARB's proposed 80% renewable hydrogen mandate will create significant uncertainty around eligible volumes.

- 195.16 Renewable hydrogen volumes are highly uncertain. CARB's proposed 80% renewable hydrogen mandate ties the availability of any fossil-based hydrogen in 2030-2035 to the availability of a specific percentage of renewable hydrogen volumes. For example, if only 80 tons per day of renewable hydrogen production materialize by 2030, LCFS credit eligibility for lower-carbon fossil-based hydrogen production would be limited to 20 tons per day. Whereas, if 800 tons per day of renewable hydrogen production materializes by 2030, 200 tons per day of fossil-based hydrogen would be LCFS eligible. Fossil-based hydrogen producers will be forced to rely on third-party performance in order to continue supplying product, which will create significant uncertainty around future investments and ongoing hydrogen projects. This uncertainty comes at a time when lower-carbon hydrogen projects employing CCS are being developed, risks and returns are being weighed, and funding decisions are being made.
- CARB has not indicated how the 80% renewable mandate will be implemented. CARB's proposed 80% renewable hydrogen mandate is ambiguous and offers no details regarding how

195.17 this will be measured or enforced. Without further clarification, this mandate creates significant uncertainties for any fossil-based hydrogen project starting in 2030, which may deter investment decisions being made today despite a clear market demand for hydrogen fuels.

Eliminating fossil-based feedstocks will arbitrarily restrict hydrogen supply, strand key assets, and forgo important emission benefits.

- Restricting hydrogen feedstocks will forgo important emission benefits. Sunsetting fossilbased hydrogen credits limits hydrogen production from natural gas, including the deployment of carbon capture and sequestration technologies that would dramatically lower the CI scores. By constraining production eligibility, CARB is failing to achieve the "maximum technologically feasible and cost-effective greenhouse gas emission reductions" in accordance with HSC § 38560. A technology-neutral approach would better align with CARB's rulemaking obligations under Gov. 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. Further, HSC § 38562.2 obligates CARB to "[i]dentify and implement a variety of policies and strategies that enable carbon dioxide removal solutions and carbon capture, utilization, and storage technologies in California to complement emissions reductions . . .". By disallowing fossil gas feedstocks under the LCFS, CARB is violating the mandate under HSC § 38562.2 and preventing the use of lower-carbon hydrogen production using CCS under the program.
- Eliminating credits for fossil-based hydrogen will strand existing assets and deter future investments. The 2035 sunset of fossil-based hydrogen credits does not leave sufficient time for companies to recoup their investment in both CCS retrofits to existing hydrogen production, and facilities that have yet to be built. This will likely deter investment in the production of lower-carbon fossil-based hydrogen. CARB's proposed departure from a technology-neutral, market-based approach sends a clear message to investors that California's regulatory agencies may arbitrarily change rules and negatively impact the investment landscape. Large-scale innovation and new investment in various industrial sectors rely on a diverse portfolio of resources. Arbitrarily restricting production technologies will likely stifle investments and innovation and will drive up program costs.
- Renewable hydrogen development is currently too costly and not at a scale to support additional hydrogen demand. CARB's proposal favors electrolysis using renewables, even though this technology is, by most estimates,²² at least triple the cost of hydrogen currently produced by steam methane reforming. In addition, the supply of renewable hydrogen is still limited due to the failure to scale up fast enough to meet demand. Limiting hydrogen development by constraining supply creates uncertainty for investments in hydrogen vehicles and fueling infrastructure that presents risks for the future of California's hydrogen economy.

The LCFS *market-based program* should continue to preserve consumer choice by providing a level playing field for *all* technologies, embracing fuel- and technology-neutral principles that focus on the meaningful and timely reduction of GHG emissions. By constraining production eligibility, CARB is failing to achieve the "maximum technologically feasible and cost-effective greenhouse gas emission reductions" in accordance with HSC § 38560. A technology-neutral approach would better align with CARB's rulemaking obligations under Gov. 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. Further, HSC § 38562.2

195.21

²² Justin Bracci, Adam Brandt, Sally M. Benson, Gireesh Shrimali and Sarah D. Saltzer, "Pathways to Carbon Neutrality in California: The Hydrogen Opportunity," Stanford Center for Carbon Storage and Stanford Carbon Removal Initiative.https://sccs.stanford.edu/california-projects/pathways-carbon-neutrality-california. https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/lcfs_appa1.pdf

- 195.21 obligates CARB to "[i]dentify and implement a variety of policies and strategies that enable carbon dioxide removal solutions and carbon capture, utilization, and storage technologies in California to complement emissions reductions . . .". By disallowing fossil gas feedstocks under the LCFS, CARB is violating the mandate under HSC § 38562.2 and preventing the use of "blue hydrogen" under the program.
- Again, CARB's late addition of these provisions likely conflicts with CARB's rulemaking obligations under Gov. Code § 11346.8(c), which makes clear that CARB cannot significantly alter its proposal from what was originally proposed in the 45-day notice without providing a new 45-day public comment period. To avoid triggering a new 45-day comment period, any substantive proposed changes in a supplemental 15-day comment period must be "sufficiently related to the original text that the public was adequately placed on notice that the change could result from the originally proposed regulatory action." These additional 15-day changes are not sufficiently related to the original proposal to provide stakeholders with sufficient notice of CARB's revised proposal.

5. CARB Should Revise the Automatic Acceleration Mechanism (AAM).

WSPA recommends the following updates to the AAM provisions; please note that the recommended revisions that follow the need for data clarification requirements would only be applicable should CARB retain reliance on quarterly credit bank fluctuations:

- Base trigger on calendar year. WSPA recommends that CARB adjust the AAM trigger to reflect banking trends across the calendar year, rather than quarterly fluctuations. This approach would better align with program compliance requirements, which are based on a calendar year, and would be more representative of actual credit/deficit trends. Quarterly credit bank fluctuations may not necessarily reflect a meaningful trend when trying to determine when the AAM is triggered.
 - Provide sufficient stakeholder notice. Should CARB retain the proposed quarterly basis for the trigger in §95484(b), WSPA recommends that CARB update the proposed language in §§§§ 95484(c)(2), 95484(b)(1), 95484(b)(2), and 95484 (b)(2)(A) to better align with CARB's intent to "provide earlier notice to stakeholders that the AAM has been triggered, providing further market certainty and lead time to LCFS participants." For example, the currently proposed language under § 95484(c) could be interpreted as resulting in *less time* for stakeholders for announcements made in August and November and potentially resulting in a second AAM trigger occurring before the first AAM has been implemented for a full compliance year.
 - *Clarify data requirements.* CARB should clarify that the triggers calculated in § 95484(b)(2) must use *final reconciled quarterly transactions reports* (which are not due until three months after the quarter in question) rather than incomplete data that has yet to be reconciled (submitted within 45 days after the quarter in question). WSPA recommends the following proposed changes:

§ 95484(b)(1)

The Automatic Acceleration Mechanism cannot be triggered in the four quarters that immediately follow an announcement that the Auto Acceleration Mechanism has been triggered <u>or in the</u> calendar year following an update to the benchmark schedule pursuant to § 95484(c)(1).

§ 95484(b)(2)

The Automatic Acceleration Mechanism is triggered when the conditions in both subparagraphs (A) and (B) below are met, and if it was not triggered in the immediately prior four quarters <u>or in</u> the calendar year following an update to the benchmark schedule pursuant to § 95484(c)(1).

195.23 § 95484(c)(2)

Cont.

An updated benchmark schedule posted pursuant to § 95484(c)(1) will override any prior benchmark schedules and will take effect January 1 of the calendar year after the

§ 95484(b)(2)(A)

Credit Bank 20xx is the final credit bank for the program as calculated at the end of the four quarters preceding the guarterly Automatic Acceleration Mechanism announcement; and

 $Deficits_{20xx}$ is the total number of annual deficits generated under the program as calculated at the four quarters preceding the guarterly Automatic Acceleration Mechanism announcement.

§ 95484(b)(2)(B) would require similar changes to the definition of Credits and Deficits as proposed above.

We reiterate that the above subsections would need to be modified should CARB maintain an AAM triggering mechanism based on a calendar year.

6. The Program Revisions Should Properly Account for Reduced Land Use Change (LUC).

195.24 WSPA urges CARB to reconsider proposed changes in § 95488.3(d)(2), which would allow the Executive Officer to assign *only* a more conservative LUC value. CARB should be able to assign *either* a higher *or lower* LUC value than those listed in Table 6. Failing to recognize evolving market and technology advancements could undermine efforts to produce more affordable. lower-CI fuels.

7. Additional Flexibility Needed for Validation and Verification Services.

In § 95501(b)(3), as an alternative to site visits at the central records location, CARB should allow 195.25 virtual visits through online technologies that enable screen sharing. A physical site visit to look at data on a screen in a conference room does not bring any additional value than sharing a screen through a virtual meeting would. Reducing unnecessary travel would also have the benefit of decreasing GHG emissions associated with verification activities.

8. CARB Should Not Adopt Further Changes to ZEV Crediting Provisions.

In previous comments, WSPA expressed significant concerns regarding proposed changes that 195.26 affect crediting for ZEV charging, which would unreasonably favor ZEV technologies above other emission-reduction technologies. Rather than address these comments, CARB is now proposing to expand these changes.

First, WSPA again emphasizes that the LCFS market-based program should continue to preserve consumer choice by providing a level playing field for *all* technologies - which will be a critical component towards achieving the goals outlined in CARB's 2022 Scoping Plan. A technologyneutral approach better aligns with CARB's rulemaking obligations under Gov. 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. Revising § 95483 to explicitly reallocate Electric Distribution Utility base credits to Original Equipment Manufacturers that manufacture light-duty vehicles effectively subsidizes mandates an increased use of light-duty ZEV and imposes a substantial burden on other program participants.

Second, WSPA reiterates that CARB's late addition of these provisions likely conflicts with CARB's rulemaking obligations under Gov. Code § 11346.8(c), which makes clear that CARB cannot significantly alter its proposal from what was originally proposed in the 45-day notice without providing a new 45-day public comment period. To avoid triggering a new 45-day comment period, any substantive proposed changes in a supplemental 15-day comment period must be "sufficiently related to the original text that the public was adequately placed on notice that the change could result from the originally proposed regulatory action." These additional 15-day changes are not sufficiently related to the original proposal to provide stakeholders with sufficient notice of CARB's revised proposal.

195.27 9. CARB Should Not Adopt Changes to RNG Crediting Periods.

CARB's proposed updates to crediting periods for avoided methane crediting for dairy and swine manure pathways could unnecessarily delay crediting. As revised, § 95488.9(f)(3)(A) states that "Avoided methane crediting for dairy and swine manure pathways as described in (f)(1) above, and for landfill-diversion pathways as described in (f)(2) above, certified on or after the effective date of the regulation and before January 1, 2030, is limited to two consecutive 10-year crediting periods, counting from the quarter following Executive Officer approval of the application." This language is unclear as to what "certified" refers to. Requiring a certified pathway could unreasonably delay crediting due to the historically lengthy process for CARB to certify pathways, which will harm project developers who made the early investment decisions several years prior on these important projects to address methane emissions. Project developers may still be waiting on CARB to approve relevant pathways even if projects have begun construction. We urge CARB to use the date of the first pipeline injection to determine whether pathways are granted two or three consecutive 10-year crediting periods.

WSPA appreciates the opportunity to provide these comments.

Sincerely,

Janua L

Tanya DeRivi Senior Director, California Climate and Fuels

Comment Log Display

Here is the comment you selected to display.

Comment 196 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Bobbie
Last Name	Cane
Email Address	Non-web submitted comment
Affiliation	
Subject	Comment for Second 15-Day Changes to the LCFS

Comment

196.1

Comment received during 2nd 15-day comment period. Submitted by Clerk of the Board on Commenter's behalf.

Dear Clerk of the Board,

While considering revisions to the LCFS, please take into account
the needs of the companies that are currently selling retail
hydrogen. The folks who drive FCEVs rely on these companies to
refuel and currently, the price of the fuel is so high that we are
not driving these cars nearly as much as we could; some people are
not driving them at all. Many of our Association members and
others have indicated that they have stashed their cars in the
garage to wait until the price comes down. That means that instead
of taking CO2 out of the atmosphere, we are putting more in, which
is contrary to the reason we bought these cars in the first place -
to slash carbon emissions and to further the climate goals of
California. The companies that sell retail hydrogen are on the
forefront of hydrogen car and hydrogen truck adoption. Without
them, we would not be talking about full decarbonization in
California with any hope that it's actually going to happen before
the climate crisis we're in gets significantly worse.

Thank you, Bobbie Cane California Hydrogen Car Owners Association

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-18 11:42:03

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Board Comments Home



October 16, 2024

Chair Liane Randolph & Members of the Board California Air Resources Board 1001 | Street Sacramento, CA 95814

Via electronic submission

Re: Second 15-Day Changes to the Proposed Regulation Order

Dear Chair Randolph and Members of the California Air Resources Board:

The Iowa Soybean Association appreciates the opportunity to comment on the proposed modifications (Second 15-Day Changes) to the Low Carbon Fuel Standard (LCFS) program. ASA has welcomed engagement with the California Air Resources Board (CARB) and staff throughout this multi-year process to update the LCFS program.

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.

197.1 CARB's Second 15-Day Changes to revise the LCFS did not address our major concerns with
 197.2 provisions included in the August 15-day notice nor did it provide additional clarification or detail
 related to sustainability reporting requirements for agricultural feedstocks. We do appreciate the
 additional flexibility related to virgin vegetable oil feedstock limitations, by extending the
 compliance deadline to January 1, 2028, for all approved pathways at the date of adoption.
 However, additional feedstock limitations included in the Second 15-Day Changes document
 could further limit soybean oil market share in California, when compared to the August

In addition to the new proposals in the Second 15-Day Changes package, Iowa Soybean
 Association remains deeply concerned with the drastic pivot CARB has made in the past few months related to agricultural feedstocks used for biofuels. We continue to encourage that updates to the LCFS program are based on science, as required by AB-32.

Amended Feedstock Cap Considerations

197.6 Iowa Soybean Association has significant concerns with the virgin vegetable oil feedstock cap that was included in the initial 15-Day Changes posted in August, especially after CARB itself noted that a cap will increase the utilization of petroleum diesel. The current proposal limits, or

IOWA SOYBEAN

Association caps, the amount of soybean oil that is allowed to generate credits in the program at an arbitrary 20%. Now, CARB is expanding on this cap in its Second 15-Day Changes with the inclusion of 197.6 sunflower oil. Adding additional feedstocks to the 20% aggregate cap will further limit market cont. access for soybean oil and additional gallons of low-carbon fuels. Based on CARB's own analysis, a cap on credit generation for vegetable oil feedstocks will lead to an increase in fossil diesel use compared to the status quo. While Iowa Soybean Association agrees that all feedstocks entering the California LCFS market should maintain fidelity to the assumptions underlying their life-cycle assessment (LCA), domestic agricultural feedstocks are 197.7 facing a redundant, triple penalty through an outdated indirect land use change (ILUC) score, stringent sustainability reporting requirements, and a proposed arbitrary cap on credit generation while all other feedstocks, including imports, do not face the same restrictions. The proposed cap increases soy's carbon intensity (CI) score for amounts over the cap from the established pathway, which is based on science, to the benchmark CI, which is not based on an 197.8 LCA for soy. This is effectively increasing soy's ILUC score by upwards of 50% for many pathways without a scientific basis. In fact, CARB has refused to use new data related to ILUC while at the same time effectively increasing it by an arbitrary amount. The increase in ILUC for ag feedstocks above the 20% threshold will effectively shut them out of the LCFS. Biomass-based diesel provides GHG and emissions benefits that are unpriced by the 197.9 market. As a result, they cost more to produce than they can be sold for and rely on policy to account for these benefits. Without the credit generation, soy will not be able to compete against waste feedstock imports, thereby capping use in the LCFS. North American agricultural feedstocks for biofuel production are already held to a high 197.10 standard for participation in the Renewable Fuel Standard (RFS) and the Canadian Clean Fuels Regulations. Rather than adding additional sustainable North American feedstocks to its arbitrary proposed cap, CARB should consider updating carbon intensity analysis and oversight of 197.11 imported feedstocks, which are not held to the same level of accountability. While Iowa Soybean Association is steadfast in its opposition to the virgin vegetable oil feedstock cap and the rationale used to reach this conclusion, the Second 15-Day Changes added some 197.12 additional flexibility to come into compliance with the arbitrary cap. We appreciate CARB's acknowledgement that biofuel production facilities cannot shift production overnight, and thank CARB for updating the grandfathering clause to provide a 2028 compliance date for all approved pathways in the LCFS program.

Carbon Intensity Scoring and Auto Acceleration Mechanism

197.13 Iowa Soybean Assocation remains concerned that without a comprehensive update to the Global Trade Analysis Project model for biofuels (GTAP-BIO) that CARB utilizes, soy-based feedstocks will be phased out of the LCFS even without the additional limitations being proposed in the Second 15-Day Changes. Current data indicates a much lower CI score for soybeans, as growers continue to improve soil practices, limit water use, lower on-farm emissions and more. On the one hand, CARB is recommending stringent sustainability guardrails for U.S. soy, but on the other IOWA SOYBEAN Association

hand is still on track to likely phase-o<mark>ut soy-based biofuels from credit generation by approximately 2035 or sooner.</mark>

197.13 cont.

As CARB looks to develop a more aggressive auto acceleration mechanism to reach CI reduction benchmarks sooner, using outdated methodologies will only limit the output of actual improvement over time in terms of emissions reductions. As CARB updates all other major lifecycle emissions models through this rulemaking, we once again urge action to update the GTAP-BIO model so that the most current, science-based data may be used to determine carbon intensity reductions.

In terms of updating the timeline for analysis of data to trigger the auto acceleration mechanism, lowa Soybean Association appreciates that CARB is seeking to provide additional notice to the market before a trigger is implemented through the ability to analyze data quarter over quarter rather than just annually. This will allow the industry more time to plan and make business decisions ahead of new benchmarks triggering.

Sustainability Guardrails and Traceability Concerns

197.15 Iowa Soybean Association remains very concerned about the sustainability guardrails. The sustainability guardrails are more onerous than the specified source requirements used for waste feedstock imports. Palm oil in Southeast Asia has had forced labor concerns¹, but CARB does not require used cooking oil derived from palm to track social or economic sustainability. Concerningly, petroleum also does not have to track these criteria. CARB's proposal makes it administratively easier to use non-sustainable petroleum² in the state than biofuels that have lower CI scores and are produced from sustainable feedstocks grown in the United States. Land
 197.16 use change is already captured in the ILUC score, which makes it unclear what purpose the guardrails serve.

The Second 15-Day Changes offered a bit more detail about how CARB plans to implement its reporting and requirements in terms of traceability, but we continue to have serious concerns about how this proposal will work in practice. By way of background, soybean products pass through many hands before final use. A soybean is produced, potentially transported to a grain elevator, then must reach a soybean processor to be separated into soybean oil and soybean meal (crushed). The meal and oil can then be delivered to end users. Because of this, ensuring the identity preservation of a soybean is not easily accomplished. Soybeans are a bulk commodity, and infrastructure in the U.S. was not developed to segregate subunits of the crop. This bulk handling system based on comingling is one of the inherent advantages the United States has as it reduces transportation costs, and subsequently on-ground emissions.

197.18

CARB's proposal states that farmers will have to declare the geographical shapefiles or coordinates of farm boundaries starting in 2026. This raises many issues including the definition of a farm and how grain must be traced and reported if harvested from several fields but comingled at storage. While the deforestation requirements do not start until 2028, the

¹ https://apnews.com/article/virus-outbreak-only-on-ap-indonesia-financial-markets-malaysia-7b634596270cc6aa7578a062a30423bb

² https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2022.858512/full

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questions posed above are relevant for the attestations starting in 2026. At that point, farmers will have to declare the boundaries of their farm. CARB settling on one definition for 2026 and another for 2028 would create much confusion. Educational efforts will be needed ahead of 2026. Once farmers understand the program, it will be very difficult to change fundamental definitions.

While 2026 may seem like plenty of time, it is much less for farmers in practice. Soybeans available starting at the beginning of 2026 are from the crop harvested in the fall of 2025 and planted in the spring of 2025. Farmers are purchasing inputs for that crop currently. If delivery points for the next soybean crop require data disclosure, producers need to know that now as they plan out their upcoming crops and lock in investments. So, if new LCFS regulations are not finalized until January 2025 and planting begins in March 2025, it leaves virtually no planning time for a farmer to update practices to adhere to these new attestation requirements.

If CARB insists on agricultural feedstock traceability, then it should reward sustainable practices beyond what is already assumed in the LCA. For instance, some soybeans are double cropped 197.19 meaning they are grown as a secondary crop following a primary crop within a growing season. They are not displacing other crops or land uses. Double-crop soybeans should be eligible to have the ILUC component of the CI score removed, or at least shared with the other crop in the rotation.

Entities Eligible to Apply for Fuel Pathways

Iowa Soybean Association is concerned about CARB's proposal to give the Executive Officer the discretion to stop accepting new pathways for biomass-based diesel starting in 2031. We do not understand how this benefits the LCFS. Under AB-32, CARB must under statute minimize costs and maximize GHG reductions. It is unclear how this is served by rejecting new pathways. In fact, the LCFS is best served by allowing the most available pathways. If these pathways cannot achieve cost-effective GHG savings, they will not be utilized by the market in the LCFS. In essence, an increase in pathways can only serve to improve GHG benefits in California. Singling out a single fuel for prejudicial treatment is baffling given the goals of the LCFS and the authority that establishes it.

Recommendations to CARB

As CARB finalizes its update to the LCFS, Iowa Soybean Association aligns itself with the American 197.21 Soybean Association (ASA) recommendations that will likely prevent an increase in fossil diesel use, improve carbon intensity calculations, and improve market access for sustainable agricultural feedstock providers.

First, CARB should not apply the vegetable oil feedstock cap proposal to North American feedstocks. As noted above, these feedstocks are already subject to guardrails to ensure 197.22 production on land that has not been converted since 2008. The RFS was designed specifically to prevent land conversion for biofuel production, and U.S. Department of Agriculture (USDA) data shows a decrease in farmland over the same period.

197.18 cont.

197.20

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197.23

Second, CARB should convene an expert working group to consider issues related to the sustainability provisions and indirect land use change. CARB has utilized working groups in the past to analyze complex issues related to the LCFS and this is no different. Through meetings with CARB staff and board members, decisions are being made using competing schools of thought. Gathering experts to coalesce around an agreed upon science-based approach moving forward would ensure that CARB is utilizing the best information available. We recommend that this expert working group convenes in 2025 and provide recommendations by October 2026.

Lastly, CARB must undertake a comprehensive update of the GTAP-BIO model for soybean oil used in biofuel production. Without using the most up-to-date and accurate data, CARB is doing a disservice to the feedstock producers and California's citizens by calculating carbon intensity scores not rooted in current fact. Through CARB's own analysis we know that basing decisions off old data will lead to more—not less—emissions in the California transportation sector.

Conclusion

- 197.25 lowa Soybean Association is encouraged by the continued successes of programs that support the development of cleaner, low-carbon fuels. However, it is critical that CARB finalizes updates in a way that does not arbitrarily exclude agricultural feedstocks through policies that are not science-based and run afoul of CARB's mandate, including capping vegetable oil feedstocks and applying onerous sustainability guardrails that add cost without rewarding farming practices that lower CI.
- 197.27 CARB's Second 15-Day Changes did not address any of the fundamental issues raised by soybean farmers in the first 15-Day Changes and fails to acknowledge the potential unintentional consequences of a feedstock outlined by its own employees only a few months before. CARB is required under the law to achieve the maximum technically feasible and cost-effective
 197.29 reductions in GHGs. The two most recent 15-Day Changes show a lack of willingness to achieve the statutory obligations set forth in AB-32.

lowa Soybean Association is eager to continue working with CARB to support the role of agriculture in diversifying the fuel supply while reducing GHGs and increasing clean air 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,

Brent Swart President Iowa Soybean Association

October 16, 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 Second 15-Day **Proposed Amendments to the Low Carbon Fuel Standard Workshop**

Dear Ms. Sahota and CARB Staff,

The National Corn Growers Association (NCGA) appreciates the opportunity to provide comments on the Second 15-Day Proposed Amendments to the Low Carbon Fuel Standard (LCFS). We thank CARB staff for their work throughout this rulemaking process and considering stakeholder feedback. We hope to see the finalization of this rulemaking at the November 8 Board meeting so that the proposed amendments can take effect immediately and ensure the program can capture the maximum emission reductions.

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 would like to share the following comments and concerns for consideration in response to the Second 15-Day Proposed Amendments shared on October 1:

§95488.9(g): Sustainability Requirements

198.1

NCGA would like to reiterate our previous comment letter submitted on May 10, 2024. We are concerned that the proposed sustainability requirements will impose a heavy regulatory burden for credit generators, which will likely result in increased responsibility and costs on farmers. Instead, we urge CARB to consider alternatives, including on-farm crediting to reward improved agricultural practices. Incentivizing improved farm-level practices can be a more effective measure to encourage adoption of more efficient practices and technologies, leading to overall carbon intensity (CI) reductions for a fuel pathway.

Farm-level crediting will also support the momentum of ongoing developments and innovations in farming practices. Notably, average corn yields have had steady increases since 2007, with

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farmers able to grow more corn on less land using fewer resources.¹ Increasing yields are attributed to advancements in genetics and plant breeding, agronomic farm management, and soil fertility improvements (additional details are outlined in our May 10 comment letter). As proposed, sustainability requirements will have minimal impacts in supporting the central goal of the LCFS, reducing the CI of the transportation sector. Instead, it will add more administrative requirements that do not necessarily improve sustainability. It is evident that farmers are committed to adopting and integrating more efficient practices and technologies. Therefore, NCGA is supportive of a proposal to incentivize these initiatives instead of overly burdensome reporting requirements which will not result in CI reductions.

NCGA thanks CARB staff for their work throughout this extensive rulemaking process and ongoing consideration of stakeholder feedback. We are hopeful that this rulemaking will be finalized imminently, and the proposed amendments can be implemented.

Sincerely,

Kenneth R Hartmon J.

Kenneth R. Hartman, Jr. President National Corn Growers Association

¹ Rising U.S. Corn Yields Boost Production Without Additional Land


CleanFuture, Inc. P.O. Box 23813 Portland, OR 97281-3813 office: +1 503 427-1968 e-mail: john@CleanFuture.us

October 16, 2024

Liane M. Randolph Chair, California Air Resources Board

(Comment submitted electronically)

RE: CleanFuture's Comments on the Low Carbon Fuel Standard Proposal for §95488.8(i)(2)

Dear Chair Randolph:

CleanFuture appreciates the opportunity to provide written comments on the Proposed Amendments to the Low Carbon Fuel Standard ("LCFS") Regulation, as reflected by the second 15-day rulemaking package released on October 1, 2024 (the "LCFS Proposal"). CleanFuture broadly supports the California Air Resources Board's ("CARB's") LCFS Proposal.(CleanFuture particularly appreciates and supports the acceleration of the rate of carbon intensity ("CI") reductions, the extension of the CI reduction tables to 2045, and the continued expansion of electrification crediting.

This comment letter ("Comment") is focused solely on the provision that CARB has included in the LCFS Proposal via the language contained in §95488.8(i)(2) to include electricity for EV charging for book-and-claim for biomethane. CleanFuture commends staff on inclusion of book-and-claim biomethane to electricity as an eligible fuel. However restricting the generation of electricity to fuel cells goes against a central tenet of technology neutrality in the LCFS. CleanFuture requests CARB to allow biomethane to produce electricity without restriction on a specific generation technology.

CleanFuture is an industry leading company connecting clean vehicle fleet customers with low CI fuels, serving both on the supply and demand side in California's LCFS, Oregon's Clean Fuels Program ("CFP"), Washington's Clean Fuels Standard ("CFS"), and other emerging clean fuel standards. CleanFuture is a designated credit generator and aggregator for hundreds of fleets and thousands of vehicle units for these state CFS programs. CleanFuture provides full-service low carbon consulting to its clients including fleet efficiency; low carbon fuel utilization; clean vehicles and vehicle technologies; and monetization strategies. CleanFuture has worked for over a decade to improve the efficiency of a wide range of vehicle fleets. CleanFuture is the leading supplier of renewable electricity from biogas as a transportation fuel to heavy-duty EVs in California's LCFS and Oregon's CFP. We also serve as a third-party aggregator and supply funding to fleets to incentivize and advance heavy-duty vehicle electrification and charging stations, while improving economics for biogas to renewable energy projects. CleanFuture is under contract with numerous heavy-duty vehicle fleets with constrained electricity capacity and/or lengthy lead-times for interconnections to upgrade

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electric service at fleet depots which hinders widespread adoption of heavy-duty EVs. Distributed generation with biomethane to electricity for EV charging can alleviate constraints and streamline electrification. However we are concerned on CARB's intent to restrict eligibility of biomethane to electricity for EV charging to a specific generation technology, and instead encourage flexibility.

A Dairy Digester Emissions Matrix and Assumptions (November 30, 2018) was developed by the California Air Resources Board during the Dairy and Livestock Subgroup #2 collaborative process. This document is included by reference in Exhibit 1 which outlines the net benefits of greenhouse gas and criteria pollutant emissions that could result from capturing and utilizing dairy biogas in one of five fuel pathway scenarios as compared to the reference scenario where the biogas is emitted into the atmosphere from an uncovered lagoon.¹ A summary of the Dairy Digester Emissions Matrix² is shown in Table 1 below:

	Net Benefits							
Scenario	CO ₂ e (20-yr GWP)	CO₂e (100-yr GWP)	NOx	PM ₁₀	^{PM} 2.5	со	SOx	VOCs
Onsite Reciprocating Engine to Grid and EVs	-60,934	-24,356	-4.9	-0.9	-0.4	3.2	-2.3	-3.4
Pipeline Injection to NG Vehicles	-54,491	-19,402	-4.1	-0.2	<0.1	52.1	-1.0	-14.1
Pipeline Injection to Power Plant, Grid and EVs		-26,853	-7.1	-1.5	-0.8	-5.8	-3.1	-4.0
Pipeline Injection to Hydrogen Vehicles	-56,702	-21,066	-1.3	-0.4	<0.1	-1.7	0.3	-3.2
Pipeline Injection to Fuel Cell, Grid and EVs		-28,073	-7.8	-1.7	-0.9	-6.6	-3.6	-4.2
Uncovered Lagoon	70,581	24,519	<0.1	<0.1	<0.1	<0.1	<0.1	3.0

Table 1- Summary of Dairy Digester Emission Matrix

199.4

199.3

The "Onsite Reciprocating Engine to Grid and EVs" scenario provides equivalent or superior net benefits of greenhouse gas and criteria pollutant emissions in comparison to "Pipeline Injection to NG Vehicles" so we urge CARB to remove the restriction to fuel cells only. We urge CARB to allow for Pipeline Injection to Reciprocating Engine to Grid and EVs on the premise that this scenario would be more similar to Onsite Reciprocating Engine to Grid and EVs instead of Pipeline Injection to Power Plant, Grid, and EVs.

New electric generation technologies have emerged since the 2018 Dairy Digester Emission Matrix such as linear generators – these are commercially available now yet were not on the market back in 2018. Allowing biomethane to produce electricity for EV charging should have flexibility, whether that generation technology is a reciprocating engine, linear generator, fuel cell, a micro-turbine, or another generation technology.

The clean emissions performance of linear generators and comparability to fuel cells was recently validated through AB 1921, which was signed into law by Governor Newsom last month. AB 1921 explicitly includes linear generators using renewable fuels as eligible under the state's RPS, just like fuel cells currently are. Linear generators are clean, low-emission technologies. We understand that CARB staff have seen data comparing emissions from linear generators to those from fuel cells, which demonstrate similar criteria pollutant emissions between the technologies. Including linear generators in the LCFS program aligns with

¹ <u>https://ww2.arb.ca.gov/resources/documents/dairy-digester-emissions-matrix</u>

² https://ww2.arb.ca.gov/sites/default/files/2020-07/dairy-emissions-matrix-113018.pdf

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CARB's objectives of reducing transportation-related emissions and promoting cutting-edge, clean technologies.

199.5

The ability to use renewable fuels, such as biomethane to produce electricity, would further align with California's climate goals, but unfortunately, the LCFS Proposal only allows bookand-claim access for biomethane if used in a fuel cell to produce electricity. While we appreciate this proposed amendment and the use of fuel cells for book-and-claim for biomethane, we encourage CARB to provide additional flexibility for book-and-claim biomethane across all generation technologies.

The operative language of LCFS Proposal is as follows³:

§95488.8(i)(2). Indirect Accounting for Low-CI Electricity, Biomethane, and Low-CI Hydrogen.

()	
	(2) → Book-and-Claim Accounting for Pipeline-Injected Biomethane Used as a Transportation Fuel, to Produce Electricity for EV Charging, or to Produce Hydrogen. Indirect accounting may be used for RNG used as a transportation fuel, to produce electricity using a fuel cell for EV charging, or to produce hydrogen for transportation purposes (including hydrogen that is used in the production of a transportation fuel), 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 to produce electricity using a fuel cell for EV charging, or as an input to hydrogen production, 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.¶

(...)

To provide flexibility for biomethane to produce electricity for EV charging, CleanFuture recommends a slight modification to the language contained in the LCFS Proposal:

Section §95488.8(i)(2):

(2) Book-and-Claim Accounting for Pipeline-Injected Biomethane Used as a Transportation Fuel, to Produce Electricity for EV Charging, or to Produce Hydrogen. Indirect accounting may be used for RNG used as a transportation fuel, to produce electricity using a fuel cell for EV charging, or to produce hydrogen for transportation purposes (including hydrogen that is used in

³ This version shows in marked-up format all proposed changes made to the current LCFS regulation during the LCFS rulemaking process as reflected in Attachment A-1.2 referenced in the Notice as "Proposed Second 15-Day Modifications to Proposed Regulation Order (First and Second 15-Day Modifications and 45-Day Modifications combined and compared to existing regulatory text) in Alternative format as released with the second 15-day package and available at https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/2nd_15day_atta-1.2.docx



the production of a transportation fuel), 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 to produce electricity using a fuel cell for EV charging, or as an input to hydrogen production, 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 to produce electricity using a fuel cell for EV charging, or as an input to hydrogen production must demonstrate compliance with the following requirements:
 - 1. Starting January 1, 2041, for bio-CNG, bio-LNG and bio-L-CNG pathways, and January 1, 2046, for biomethane used to produce electricity using a fuel cell for EV charging, or as an input to hydrogen production, 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. Notwithstanding the above, if the number of unique Class 3-8 ZEVs reported or registered in California exceeds 132,000 ZEVs or NZEVs on December 31, 2029, based on the evaluation and notification specified by subsection 95488(d)(1), then the entity reporting under bio-CNG, bio-LNG and bio-L-CNG pathways for CNG vehicles must demonstrate the physical flow listed above after December 31, 2037. Entities may report natural gas as RNG within only a threequarter 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 guarter. After that period is over, any unmatched RNG quantities expire for the purpose of LCFS reporting.
- (C) To substantiate RNG quantities injected into the pipeline for dispensing as bio-CNG, bio-LNG, or bio-L-CNG, or to produce electricity using a fuel cell for EV charging, or as an input to hydrogen production, the pathway application and subsequent Annual Fuel Pathway Reports must include the following documents linking the environmental attributes of RNG (in MMBtu or Therms) with corresponding quantities of natural gas withdrawn:

Thank you for your consideration of these comments. Please advise if any further input on these issues would be constructive.

Sincerely,

John A. Thornton, President CleanFuture, Inc.



Exhibit 1⁴

Dairy Digester Emissions Matrix

November 30, 2018

		A	В	с	D	E	F	G	н	
_			CO ₂ e (20-yr GWP)	CO ₂ e (100-yr GWP)	NOx	PM ₁₀	PM _{2.5}	со	SOx	VOCs
1	Uncovered Lagoon	Baseline Totals (Local + Remote)	70,581	24,519	<0.1	<0.1	<0.1	<0.1	<0.1	3.0
2		Local	17.491	7,474	0.5	0.2	0.2	8.5	<0.1	0.6
3		Remote	765	318	0.1	<0.1	< 0.1	0.1	0.1	<0.1
4	Onsite	Subtotal	18 256	7 792	0.6	0.2	0.2	8.6	0.1	0.6
	Reciprocating	(Row 2 + Row 3)	10,230	7,752	0.0	0.2	0.2	5.0	0.1	0.0
5	Engine to Grid	Diesel Displaced	8,609	7,629	5.5	1.1	0.6	5.4	2.4	1.0
6	and EVs	(Row 4 - Row 5)	9,647	163	-4.9	-0.9	-0.4	3.2	-2.3	-0.4
7		Net Benefit vs. uncovered lagoon (Row 6 - Row 1)	-60,934	-24,356	-4.9	-0.9	-0.4	3.2	-2.3	-3.4
8		Local	15,448	5,268	0.1	<0.1	<0.1	1.2	<0.1	0.3
9		Remote	4,839	3,568	4.6	0.2	0.2	52.5	0.2	0.6
10	Pipeline	Subtotal (Row 8 + Row 9)	20,287	8,837	4.7	0.2	0.2	53.7	0.2	0.9
11	Injection	Diesel Displaced	4,197	3,720	8.8	0.4	0.2	1.6	1.2	12.0
12	to NG Vehicles	Pathway Emissions (Row 10 - Row 11)	16,090	5,117	-4.1	-0.2	<0.1	52.1	-1.0	-11.1
13		Net Benefit vs. uncovered lagoon (Row 12- Row 1)	-54,491	-19,402	-4.1	-0.2	<0.1	52.1	-1.0	-14.1
14		Local	15,448	5,268	0.1	<0.1	<0.1	1.2	<0.1	0.3
15		Remote	3,860	2,957	0.4	0.1	0.1	0.4	0.2	0.1
16	Pipeline Injection to	Subtotal (Row 12 + Row 13)	19,307	8,226	0.5	0.1	0.1	1.6	0.2	0.4
17	Power Plant.	Diesel Displaced	11,916	10,560	7.6	1.6	0.9	7.4	3.3	1.4
18	Grid and EVs	Pathway Emissions	7,391	-2,334	-7.1	-1.5	-0.8	-5.8	-3.1	-1.0
19	9	Net Benefit vs. uncovered lagoon (Row 18- Row 1)	-63,190	-26,853	-7.1	-1.5	-0.8	-5.8	-3.1	-4.0
17		Local	15,448	5,268	0.1	<0.1	<0.1	1.2	<0.1	0.3
18	Dinalina	Remote	6,140	5,017	3.5	0.6	0.6	1.9	2.4	0.4
19	Injection to	Subtotal (Row 17 + Row 18)	21,588	10,285	3.6	0.6	0.6	3.1	2.4	0.7
20	Hydrogen	Diesel Displaced	7,709	6,832	4.9	1.0	0.6	4.8	2.1	0.9
21	Vehicles	Pathway Emissions (Row 19 - Row 20)	13,879	3,453	-1.3	-0.4	<0.1	-1.7	0.3	-0.2
22	(H ₂ from Swik)	Net Benefit vs. uncovered lagoon (Row 21- Row 1)	-56,702	-21,066	-1.3	-0.4	<0.1	-1.7	0.3	-3.2
23		Local	15,448	5,268	0.1	<0.1	<0.1	1.2	<0.1	0.3
24	Pineline	Remote	3,860	2,957	0.6	<0.1	<0.1	0.5	0.1	0.1
25	Injection to	Subtotal	19,308	8,225	0.7	0.1	0.1	1.7	0.1	0.3
26	Fuel Cell. Grid	Diesel Displaced	13,292	11,779	8.5	1.8	1.0	8.3	3.7	1.5
27	and EVs	Pathway Emissions (Row 25 - Row 26)	6,016	-3,554	-7.8	-1.7	-0.9	-6.6	-3.6	-1.2
28	(Solid Oxide Fuel Cell)	Net Benefit vs. uncovered lagoon (Row 27- Row 1)	-64,565	-28,073	-7.8	-1.7	-0.9	-6.6	-3.6	-4.2

Note: Units are metric tons per year (MT/yr.) for all numerical values.

⁴ <u>https://ww2.arb.ca.gov/sites/default/files/2020-07/dairy-emissions-matrix-113018.pdf</u>



Kendall Palmer Sr. Director Growth Leader Biofuels

Corteva Agriscience Johnston Global Business Center 7100 NW 62nd Avenue P.O. Box 1000 Johnston, IA 50131-1000

October 15, 2024

California Air Resources Board 1001 "I" Street Sacramento, CA 95814

Via electronic submission

Re: Proposed Low Carbon Fuel Standard Amendments

California Air Resources Board Staff:

Thank you for the opportunity to comment on the California Air Resources Board's (CARB) Proposed Low Carbon Fuel Standard Amendments, issued on October 1, 2024.

Corteva Agriscience is a leading, publicly traded, pure-play agriculture technology company headquartered in Indianapolis, Indiana, and with meaningful footprints in many other states, including lowa, Michigan and Delaware. Founded on a century of breeding and scientific expertise, we develop innovative seed and crop protection products and solutions with the goal of helping farmers around the world increase yields, drive profitability and strengthen sustainability. Corteva invests nearly \$4 million every single day into research and development. As such, we work with a variety of collaborators, including universities, small businesses and start-ups, to advance our own innovation and give them access to ours, while also equipping them to provide consumers with a wider range of safe, healthy and nutritious food options. Taken together, these products are critical components to a resilient agricultural system that enables food and energy security.

We support the state of California's move to find lower-carbon sources of fuel and believe that agriculture can and must be part of the solution, including through wider adoption of biofuels, which by their nature are renewable and lower-carbon than traditional fossil fuels.

One way our company is leading the way is through the cultivation of winter canola across several states in the U.S. mid-South. Together with Bunge and Chevron Renewable Energy Group, we are working to build the necessary seed and processing supply chain to converting this winter canola into renewable diesel and sustainable aviation fuel, which would be compatible with existing combustion engines and provide a more sustainable option for aviation and diesel fleets. Importantly, it will also support farmers: because winter canola is a double crop, planted when the ground would otherwise lie fallow, farmers can use it as a source of additional revenue while ensuring the sustainability of their operation by reducing greenhouse gas emissions and protecting soil health.

As CARB reviews proposed amendments to the Low Carbon Fuel Standard, we encourage you to consider the following key points:

- 1. **Remove the unnecessary cap on certain feedstocks**: In absence of a compelling rationale, the cap on certain biofuel feedstocks is unnecessary. The fuels subject to the cap will naturally be phased out of the program by the declining carbon intensity targets; therefore these feedstocks do not need to be made subject to the proposed 20% cap as defined in § 95482(i).
- 200.2 2. Incentivize domestic production and supply: The ability of the U.S. and Canada to provide a ready and abundant source of verified, domestically produced, oilseed-based feedstock reduces the need of relying upon imported feedstocks in addition to the benefit to our domestic economies, it also reduces the risk of feedstocks derived from palm oil or palm derivatives. Relying on domestic sources would also negate the need for costly verification procedures in order to comply with Section 95482(f) because no palm oil or palm derivatives are produced in the U.S. or Canada. Unlimited inclusion of domestically produced biofuel feedstocks such as soybean oil, canola oil, and sunflower oil, as proposed in Section 95482(i), will help meet the requirements of Section 95482(f), which specifies the ineligibility of transportation fuel derived from palm oil or palm oil or palm derivatives for LCFS credit generation.
- 200.3
 3. Include winter canola as a key feedstock: Winter canola is an emerging crop with a materially different emissions and land use profile. CARB should recognize that intermediate oilseed crop feedstock sources such as canola, grown as a second crop, provide multiple sustainability benefits to the environment in addition to its value as a low-carbon-intensity feedstock (source: Cover Crops for Climate Resilience | USDA Climate Hubs). Specifically, they:
 - a. Store carbon in the soil;
 - b. Reduce soil erosion and runoff;
 - c. Increase soil organic matter;
 - d. Reduce weeds, pests, and disease pressure;
 - e. Provide habitat for pollinators and wildlife;
 - Winter canola and other intermediate crops provide early forage resources for pollinators (source: <u>Using pennycress</u>, camelina, and canola cash cover crops to provision pollinators ScienceDirect)

CARB should recognize that the intermediate oilseed crop feedstock sources such as winter canola that is grown as a second crop are grown on land that would otherwise be fallow during the intermediate growing season. Production of biomass-based diesel feedstock in these systems is effectively adding "virtual acres" to the overall acreage pool without displacing other crops or changing land use in other parts of the globe. Therefore, the use of intermediate oilseed crop feedstock sources - such as canola grown as a second crop - reduces the potential for land use change. As these oilseed crops are crushed for oil feedstock, the meal produced as a co-product increases the available supply of vegetable protein meal, such as that used in California's dairy and other livestock industries, thereby reducing the economic incentive for land use change.

As such, winter canola has the potential to be a key feedstock crop for renewable fuels; its adoption is just beginning to increase. Inclusion in CARB is a key step to support this low carbonintensity crop as an alternative feedstock not subject to the 20% cap. It is important that CARB clarify inclusion of winter canola – and at the same time, ensure that no alternative feedstocks are included. As CARB is updated to add sunflower oil, we also recommend adding the following definition to § 95481(a):

- f. "Primary-Crop Canola" means canola that is the crop produced during that geographical area's main growing season. Primary-crop canola does not include canola that is grown as a second crop or as a cover crop.
- 200.4a 4. The term "Primary-Crop Canola" should then be incorporated into § 95482(i) as follows:

200.4

- 200.4a cont.
- a. Biomass-based diesel produced from soybean oil and <u>primary-crop</u> canola oil is eligible for LCFS credits for up to twenty percent combined of total biomass-based diesel annual production reporting, by company. Any reported quantities of biomass-based diesel produced from soybean oil and <u>primary-crop</u> canola oil in excess of twenty percent on a company-wide basis will be assigned a carbon intensity equivalent to the carbon intensity benchmark shown in Table 2 in Section 95484(e) for the applicable data reporting year, or the certified carbon intensity for the associated fuel pathway – whichever is greater. For companies with biomass-based diesel pathways certified prior to the effective date of the regulation and for which the percentage of biomass-based diesel produced from soybean oil and <u>primary-crop</u> canola oil was greater than 20 percent of combined reported biodiesel and renewable diesel quantities for 2023 LCFS reporting, this provision takes effect beginning January 1, 2028.
- 5. Table 6 should be updated to indicate that the land use change value listed applies to Primary Crop Canola Biomass-based Diesel.

Once again, we appreciate the opportunity to comment on the proposed Low Carbon Fuel Standard Amendments and look forward to supporting your efforts to implement an effective LCFS program. We remain at your disposal to further elaborate or answer questions about any item discussed in this document.

Sincerely,

Kendall Palmer Senior Director and Growth Leader, Biofuels Corteva

Comment Log Display

Here is the comment you selected to display.

Comment 201 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Jared
Last Name	Gilmour
Email Address	Non-web submitted comment
Affiliation	
Subject	Comment for LCFS 15-2 rulemaking - technical issues

Comment

Comment received during 2nd 15-Day comment period. Comment submitted by Clerk on Commenter's behalf.

Clerk of the Board:

I am writing on behalf of Bunge Limited and Robert Coviello, Chief Sustainability Officer and Government Affairs at Bunge, regarding Mr. Coviello's submission of Bunge comments in response to the California Air Resources Board ("CARB") Second Notice of Public Availability of Modified Text and Availability of Additional Documents and/or Information for the Proposed Low Carbon Fuel Standard Amendments (lcfs2024).

Bunge submitted its comments as a PDF attachment today, October 16, 2024, through the CARB online portal. However, an error message appeared upon submission, indicating that the PDF file had failed to upload. Due to these technical issues, Bunge has attached its comments on the second 15-day package of proposed Low Carbon Fuel Standard amendments here.

These comments should appear under the name Robert Coviello (email: robert.coviello@bunge.com) (affiliation: Bunge Limited).

Thank you for your time and attention. Please let us know of any concerns.

Regards, Jared Gilmour

Comment Log Display

Attachment	www.arb.ca.gov/lists/com-attach/22-lcfs2024-2nd15day- AGIAcwNsV2MGZQIW.pdf
Original File Name	Bunge Comments Second 15-Day Amendments.pdf
Date and Time Comment Was Submitted	2024-10-18 11:43:30

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Board Comments Home

BŪNGE

1391 Timberlake Manor Parkway Chesterfield, MO 63107 314.292.2000 bunge.com

October 16, 2024

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

Re: Second 15-Day Package of Proposed Low Carbon Fuel Standard Amendments

Dear Chair Randolph:

Thank you for the opportunity to comment in response to the second 15-day package of proposed modifications to the 2024 Low Carbon Fuel Standard ("LCFS") amendments that the California Air Resources Board ("CARB") released on October 1, 2024. Our comments provide draft regulatory language that would clarify that winter canola, when it is grown in North America as a second crop or cover crop, should be considered a distinct feedstock from traditional canola for purposes of the proposed oilseed cap and the Table 6 canola value. Part I offers background on the issue and proposed regulatory text. Part II provides more general comments on the second 15-day package.

As a leading oilseed processor, Bunge buys and processes agricultural commodities to turn them into products used in food, animal feed, and renewable diesel. Bunge is also a 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 chains in 2025. Bunge's robust traceability and monitoring systems give us significant insight into our supply chains. We are using technology and data to scale our efforts in geographies where deforestation is a higher risk and working with farmers to incentivize sustainable practices. We have already achieved 100 percent traceability in our direct supply of soy in priority areas in South America. We achieved 97.7 percent traceability in our indirect supply of soy in Brazil's high-risk areas in 2023.

I. Proposed Regulatory Language Related to Winter Canola

A. Background on Winter Canola

In North America, winter canola is canola grown as a second crop—that is, planted in the fall and harvested in the spring between primary crops in a multi-year rotation. Farmers overwhelmingly grow winter canola on land that would otherwise be fallow during that period. As a result, winter canola does not displace other crops or generate additional demand for new October 16, 2024 Page 2

cropland, and it therefore has a demonstrably lower ILUC risk than spring canola.¹ Winter canola also provides soil health and other environmental benefits associated with cover crops. At this time, the market is relatively small for this innovative crop with many environmental benefits and few negative impacts.

Bunge is concerned that two aspects of the current regulatory text may be susceptible to an interpretation that would discourage the market for winter canola.

- 201.1 First, the proposed oilseed cap might be read to include winter canola. In the first 15-day package, CARB proposed a cap on LCFS crediting for canola oil and soybean oil. In the second 15-day package, CARB added sunflower oil to the cap and included other clarifications.² CARB has stated that the oilseed cap is intended to address the "potential adverse impacts" of these crops.³ However, CARB did not clarify in the second 15-day package that the cap does not apply to winter canola. Because the cropping practices used to grow winter canola result in a low or zero ILUC risk, LCFS crediting for winter canola would not cause the "adverse impacts" CARB is trying to address in production of conventional canola, soybean, or sunflower feedstocks. If the cap is interpreted to include winter canola, that would prevent this innovative market from scaling.
- 201.2 Second, Table 6 could be interpreted to require a higher ILUC value for winter canola than is justified by the scientific research. The current regulatory text does not make clear how winter canola would be treated for purposes of LUC accounting under § 95488.3(d) and Table 6.⁴ Table 6 includes ILUC values for six "region/feedstock/fuel combinations," including "canola biomass-based diesel" from North America.⁵ Although that ILUC value reflects 2015 modeling of conventional North American canola—i.e., canola grown as a primary crop—Table 6 does not specifically say so. As a result, there is risk that Table 6 could be read to mean that same "canola biomass-based diesel" ILUC value applies to North American winter canola, even though its cropping practices justify a lower value.

B. Proposed Regulatory Language

To address these ambiguities, Bunge encourages CARB to clarify that winter canola will not be considered as conventional canola for purposes of the proposed oilseed cap and for purposes of the Table 6 ILUC values. Failure to include these changes could seriously chill efforts to

¹ See, e.g., Farzad Taheripour & Ehsanreza Sajedinia, Purdue University, Induced Land Use Change: Case of Winter Rapeseed Biodiesel (May 2024) (examining the ILUC of the entire canola market and concluding that using winter canola oil as the feedstock "has a significant effect and decreases the corresponding ILUC emissions to about half of spring [canola] ILUC values").

² CARB, LCFS Second 15-Day Package: Proposed Regulation Order at 36, § 95482(i) (Oct. 1, 2024), https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/2nd_15day_atta-1.pdf. ³ CARB, LCFS Second 15-Day Package Notice at 3 (Oct. 1, 2024),

https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/2nd_15day_notice.pdf. ⁴ Second 15-Day Package: Proposed Regulation Order at 124–25, § 95488.3(d), Table 6.

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develop winter canola in the United States. Accordingly, we recommend adopting the following proposed regulatory language.

201.3 First, we recommend adding a new definition to "Definitions and Acronyms" in § 95481(a):

<u>"Primary-Crop Canola" means canola that is the crop produced during that geographical area's main growing season. Primary-crop canola does not include canola that is grown as a cover crop. A second crop or cover crop would not displace a main crop and would not be detrimental to soil guality.</u>

Both "second crop" and "cover crop" in the above proposed definition are defined by Department of Agriculture regulations.⁶

201.4 Second, we recommend including "primary-crop" before "canola oil" in Section 95482(i) to clarify that the oilseed cap applies to conventional canola:

Biomass-based diesel produced from soybean oil, <u>primary-crop</u> canola oil, and sunflower oil is eligible for LCFS credits for up to twenty percent combined of total biomass-based diesel annual production reporting, by company, based on the following transaction types: production in California, produced for import, and import. Any reported quantities of biomass-based diesel produced from soybean oil, <u>primary-crop</u> canola oil, and sunflower oil in excess of twenty percent on a companywide basis will be assigned a carbon intensity equivalent to the carbon intensity benchmark shown in Table 2 in Section 95484(e) for the applicable data reporting year, or the certified carbon intensity for the associated fuel pathway – whichever is greater. For companies which have submitted a biomass-based diesel pathway certification application under CA-GREET3.0 or which have a certified biomass-based diesel pathway prior to the effective date of this regulation, this provision takes effect beginning January 1, 2028.

- 201.5 Third, we recommend making clear that the canola LUC value in Table 6 applies only to conventional canola by revising "Canola Biomass-Based Diesel" to read "<u>Primary-Crop</u> Canola Biomass-Based Diesel."
- 201.6 Fourth, we recommend inclusion of the phrase "cropping practices" throughout § 95488.3(d) to confirm (1) that the pathways in Table 6 may be specific to certain "cropping practices," and (2) that CARB has authority to designate a distinct pathway and LUC value depending, in part, on cropping practices.

⁶ See 7 C.F.R. § 457.8 ("Second crop. With respect to a single crop year, the next occurrence of planting any agricultural commodity for harvest following a first insured crop on the same acreage. The second crop may be the same or a different agricultural commodity as the first insured crop, except the term does not include a replanted crop. If following a first insured crop, a cover crop that is planted on the same acreage and harvested for grain or seed is considered a second crop . . ."); *id.* ("Cover crop. A crop generally recognized by agricultural experts as agronomically sound for the area for erosion control or other purposes related to conservation or soil improvement, unless otherwise specified in the Special Provisions. A cover crop may be considered a second crop (see definition of 'second crop')").

201.6 Cont.

(d) Accounting for Land Use Change.

(1) The Executive Officer calculated LUC effects for certain region-specific cropbased biofuels using the GTAP model (modified to include agricultural data and termed GTAP-BIO) and the AEZ-EF model. LUC values for six region/feedstock/<u>cropping practices/</u>fuel combinations are provided in Table 6 below. The Executive Officer may require a fuel pathway applicant to use one of the values in Table 6, if the Executive Officer deems that value appropriate to use for a region/feedstock/<u>cropping practices</u>/fuel combination not currently listed in Table 6, based on empirical LUC, crop yields, <u>cropping practices</u>, and emissions factors.

(2) The Executive Officer may determine that no value in Table 6 is conservatively representative of a particular region/feedstock/cropping practices/fuel combination and assign a more conservative LUC value. Such determination must be based on the best available empirical data, including but not limited to satellite-based remote sensing data for land cover monitoring, crop yields, cropping practices, and emission factors from the AEZ-EF model or carbon stock datasets. For regions/feedstocks/cropping practices/fuel combinations⁷ not listed in Table 6, the Executive Officer may determine and assign an appropriate LUC value based on empirical land cover data, yields, cropping practices, and emission factors.

In comments on the first 15-day package, Bunge shared its concerns about how the proposed regulatory changes could affect the viability of winter canola-based fuels. Both the oilseed cap and Table 6 LUC values are intended to address land-conversion concerns that are likely inapplicable to winter canola. The narrow edits proposed above reinforce that allowing differential treatment for winter canola in light of its unique cropping practices is fully compatible with CARB's goals in this regulatory process. Even as the proposed changes ensure that winter canola may secure an appropriate, science-based ILUC score, they do not tie CARB's hands or *require* the agency to provide winter canola with a lower ILUC score. This language would simply ensure that the agency maintains discretion to make a science-based determination in light of all potentially relevant factors.

While Bunge believes that the regulatory language proposed above is a promising solution, Bunge is also open to other avenues to clarify that winter canola would not be subject to the oilseed cap and that a pathway with a carbon intensity value lower than that in Table 6 could be certified. We welcome further engagement with CARB on alternative possible solutions.

II. General 15-Day Package Comments

Bunge has long supported the LCFS, which has increased volumes of low-carbon fuels including the biofuels for which Bunge supplies feedstocks—to cause California's petroleum fuel

⁷ The inclusion of "regions" and "fuel combinations" here addresses an apparent drafting omission in the existing regulation.

October 16, 2024 Page 5

use to fall by 1.3 billion gallons since 2019. We are pleased to have contributed in a small way to the 12.63% decline in the carbon intensity of the state's transportation fuels since 2010.

201.7 However, Bunge is disappointed that the proposed cap on vegetable oils remained in CARB's
201.8 second 15-day package, and that the sustainability certifications and associated timelines
remained largely unchanged. Historically, the LCFS has carefully set CI scores for fuels based on science, which has been a hallmark of its success. This new proposed policy of adopting arbitrary limits on certain feedstocks threatens to undermine that science-based approach. Bunge also notes that CARB first proposed the sustainability certifications to address LUC concerns *in lieu of a cap*. Now, CARB proposes both, even though they are duplicative. Further, we maintain the concerns that we have previously raised with respect to the proposed sustainability certifications, which do not account for the fact the land-conversion risk is almost non-existent in North America. We encourage CARB to re-examine its proposed certifications to ensure the approach it is taking is commensurate with the risks specific to each region of the world.

While Bunge disagrees with the cap, Bunge appreciates that CARB has amended the proposal to give parties more time to prepare by proposing that the cap take effect January 1, 2028 for companies that have submitted biomass-based diesel pathway certification applications or have certified biomass-based diesel pathways prior to the effective date of the regulation.⁸ Bunge encourages CARB to take a similar approach with the sustainability certifications by moving back implementation of requirements related to farm boundary data and attestations so that these would apply for the 2028 data year, rather than the 2026 data year as currently proposed.⁹ As Bunge expressed in its comments on the first 15-day package, our experience implementing both voluntary and European Union sustainability measures informs our view that beginning compliance in 2028 is a more realistic timeline.

III. Conclusion

In conclusion, Bunge encourages CARB to clarify that the proposed oilseed cap and Table 6 canola ILUC value will not adversely impact winter canola, which has significant promise for further reducing the carbon intensity of California's liquid fuels without causing significant adverse impacts to land use. The draft regulatory language provided here offers one path to make this important clarification.

Bunge appreciates CARB's commitment to improving the LCFS in the 2024 amendments. We hope our comments on the second 15-day package help enhance the program in its final version.

Sincerely,

201.10

Mila Q Cially

⁸ Second 15-Day Package: Proposed Regulation order at 36, § 95482(i).

⁹ *Id.* at 169–70, § 95488.9(g)(B).

October 16, 2024 Page 6

Robert Coviello Chief Sustainability Officer and Government Affairs October 16th, 2024



The Honorable Liane Randolph Chair California Air Resources Board 1001 I Street Sacramento, CA 95814

Dear Chair Randolph:

202.1

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 second 15-day 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. Finalization of the LCFS program rules package is urgently needed to bring the credit market into balance after three years of low values and provide sustained incentives for low-carbon fuels, especially the ultra-low CI fuels needed to achieve a 90% reduction by 2045. We urge you to approve the rules package without any further delay.

Temporary CI Pathway for Biogas to Electricity Pathways

202.2 While Promus is pleased to see CARB's inclusion of a temporary CI for low-CI electricity produced by dairy or swine biomethane, it is important that projects with generation technologies in addition to fuel cells be eligible for this temporary CI pathway. Promus requests that CARB include linear generators as eligible generation technology for a temporary CI pathway. Linear generators are a non-combustion technology that meet the strictest air emission requirements in CA. This is backed up by extensive publicly available data from dozens of source tests. The recently signed <u>AB 1921</u> recognizes linear generators in addition to fuel cells as renewable power technology that complies with CA's Renewable Portfolio Standard program. To ensure consistency across programs, CARB should make linear generators put linear generators on equal footing with fuel cells. Promus proposes that CARB replace "fuel cells" with "fuel cells or linear generators" in the final rule language to ensure that they receive the same treatment in the LCFS program.

202.3 We would also encourage CARB to consider making high-efficiency (> 40% electrical efficiency), low-NOX ICE genset projects that break ground during 2025 eligible for a temporary CI for projects as a practical transition to the non-combustion future, noting solid oxide fuel cell production is just getting geared up and will generally not be available until 2026 or 2027.

Book and Claim Accounting of Biomethane for Electricity Pathways

202.4 Similarly, Promus also urges CARB to extend Book and Claim accounting of biomethane for electricity generator to linear generators instead of only to fuel cells.

Linear generators have technological benefits that make them well-suited for applications with book and claimed biomethane being used to generate electricity to power EVs. Linear generators are fully dispatchable, have full turn-down capability, and have an emissions profile equivalent to a fuel cell. Fuel

- 202.4 cells on the other hand are not as readily dispatchable, limiting their use for EV charging with
 Cont. (inconsistent electricity demand. This makes them particularly useful in helping to put more EVs on the road powered by electricity generated from biomethane.)
- 202.5 In addition, Promus wants to ensure that the regulations for book and claim accounting of biomethane for electricity pathways have no impact on the book and claim eligibility of electricity generated from biomethane on-site at a dairy digester project.

Sincerely,

Dan Evans, President Promus Energy LLC 1201 Third Ave., Suite 320 Seattle, Washington 98101 <u>dan@promusenergy.com</u> 206.300.0835

Iwatani Iwatani Corporation of America

October 14, 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 a network of hydrogen refueling stations across California and is rapidly expanding to serve the fast-growing hydrogen market in California. Our expansion plans include stations that support a variety of on-road fuel cell electric vehicles in the light-duty, medium-duty, and heavy-duty sectors. Since 1941, Iwatani has regarded hydrogen as the ultimate clean energy source and has consistently engaged in initiatives to encourage its widespread use. ICA is committed to supporting 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.

ICA greatly appreciates CARB's updated proposed changes which demonstrate a strong consideration of comments from the hydrogen industry. We believe many of the changes provide added flexibility and predictability to the LCFS program to help incentivize private investment in ZEV infrastructure. Please consider our additional comments in this letter to further enhance the program.

Iwatani Iwatani Corporation of America

ZEV Fueling Infrastructure Pathways

- 203.1 We strongly support CARB staff's decision to increase the public LMD station HRI capacity factor from 50% to 100%, which is aligned with the existing HRI provision. While we strongly support California's 203.2 efforts to expand hydrogen infrastructure and reduce carbon emissions, the specific provision capping LMD-HRI credits based on capital expenditure and external funding presents significant challenges that could hinder the growth of this essential infrastructure. While recovering the CAPEX is good, as we stated in our previous letter submitted to CARB, the revenue from the LCFS/HRI credits plays a critical role in the economic feasibility of operating ZEV infrastructure which is why the expected long-term value of LCFS credits, and the HRI pathways are so important. Limiting the value of these credits based on the capital expenditure and external funding may impede the HRI original purpose to support station over time as the fleet grows. We urge CARB to reconsider this provision and remove the credit limitation for LMD-HRI stations. Instead, we recommend allowing these stations to generate credits based solely on their refueling capacity and operational performance, without capping their credit potential based on capital expenditure or external funding. This would provide a stronger incentive for private sector investment in hydrogen infrastructure and accelerate the growth of hydrogen-powered vehicles in California.
- 203.3 ICA also wants to point out that the definition of "Medium-Duty Vehicle" (MDV) in the Modified Proposed Amendments is not aligned with the common definition of MDV and ICA urges CARB to utilize the standard definition of MDV which refers to MDV as Class 3-6 (10,001 lbs – 26,000 lbs GVWR). Many existing MDVs up to Class 6 leverage existing light-duty fueling stations today as part of normal operations, while only heavy-duty vehicles (HDV) Classes 7 and 8 typically fuel at dedicated HDV fueling lanes or truck stops. We recommend CARB harmonizes this existing definition and fueling operation with current industry standards. Specifying a different category for MDV within LCFS will create confusion for both station developers and MDV fleet operators that could hinder station development and result in stations that are not properly designed for each vehicle type.

ICA does appreciate CARB's efforts to incentivize building stations with the appropriate capacity that can support expanded vehicle volumes over time. We also appreciate the desire to create HRI pathways that support station growth for light-duty, medium-duty, and heavy-duty vehicles. We believe that

Iwatani Iwatani Corporation of America

California's ambitious carbon reduction goals require the rapid expansion of clean fuel infrastructure, including hydrogen, and the proposed amendments will pave the road to achieve the ZEV mandate goals.

Sincerely,

Hossein Tabatabaie Director of Product Management

October 16, 2024

Clerks' Office California Air Resources Board 1001 | Street Sacramento, CA 95814 (Submitted electronically via https://ww2.arb.ca.gov/applications/public-comments)

RE: Low Carbon Fuel Standard: 2024 Proposed Amendments Second 15-Day Changes

General Motors LLC (GM) appreciates the opportunity to offer comments on CARB's Proposed Second 15-Day Notice on Low Carbon Fuel Standard (LCFS) Proposed Amendments published on October 1, 2024.

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

Sincerely,

Hon. David Strickland Vice President Global Regulatory Affairs and Transportation Technology Policy General Motors LLC

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 July 2024, GM employs over 165,000 employees, operates 156 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 Second 15-Day Proposed Regulation Order⁷ released on October 1, 2024 with proposed updates to the Low Carbon Fuel Standard, particularly on aspects of the proposal related to electric vehicle charging. CARB's second proposal signals intention to pursue further reductions in carbon-based fuel impacts to the environment by incentivizing BEV deployment using decarbonized 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.

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 from 5% to 9% to achieve a 22.75% carbon intensity reduction will tighten market conditions, bolstering the market and while continuously decreasing carbon intensity in liquid fuels.

204.3 The proposed amendment to require a 30% reduction in carbon intensity by 2030 continues to be an appropriate benchmark 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.

³ Id.

204.1

204.2

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

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

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)

⁷ https://ww2.arb.ca.gov/rulemaking/2024/lcfs2024

GM commends CARB's proposal to allocate up to 45% of base credits to OEMs.

204.4 Allocating a greater share of credit generation to BEV-producing OEMs expands opportunities for incentives and infrastructure growth for electric vehicles and other projects which support transportation electrification in California. CARB allocates "up to 45% of base credits" without establishing criteria or a framework for determining the applicable percentage. GM recommends that CARB establish criteria for credit allocation which will bring increased regulatory certainty to the LCFS program. GM recommends increasing the statewide share of all new zero emission vehicle sales threshold from 25% to 50%. 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 programs, which will require 51% ZEV sales in 2028 leading to 100% by 2035 under Advanced Clean Cars II. Increasing the opportunity for credit generation will ensure that OEMs continue reinvestment into EV infrastructure within California.

CARB should continue to promote adoption of hydrogen without precluding specific feedstocks for eligibility under the LCFS program.

- 204.5 GM supports CARB's proposed updates to proposed subsection 95482(h), which extends credit generation eligibility for hydrogen produced using fossil gas as a feedstock to January 1, 2035. The 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan Update) identified a need for low-carbon, renewable hydrogen for the transportation sector (among other sectors) to displace fossil fuels in support of achieving California's greenhouse gas emission reduction goals. The 2022 Scoping Plan Update scenario did not include hydrogen produced from fossil fuels, with or without carbon capture as low-carbon, renewable hydrogen. Instead, it identified as low carbon and renewable hydrogen produced through steam methane reformation of biomethane, electrolysis, and biomass gasification. Staff is proposing to remove LCFS crediting eligibility for hydrogen produced from fossil fuels at the end of 2035 which will provide ample opportunities for non-fossil hydrogen to scale up.
- 204.6 To further continued growth of the nascent hydrogen fuel market, it is premature for CARB to eliminate feedstock pathways for hydrogen. LCFS credit generation should be determined by the carbon intensity of the fuel. LCFS is a mechanism to promote a more robust hydrogen supply for energy intensive transportation electrification.

CARB should allow medium-duty vehicles flexibility to fuel at light-duty or heavy-duty hydrogen refueling stations.

As described in the USCAR white paper⁸ on medium duty fuel cell vehicle refueling requirements, Class 3-6 trucks have unique refueling requirements that will benefit from refueling at either upgraded light-duty refueling stations or heavy-duty refueling stations. GM recommends that all future hydrogen stations should allow for the fueling of Class 4-6 vehicles which can be accommodated if the proper provisions are accounted for in the early planning stages of the stations. As currently defined in these proposed rules, Class 4-6 trucks would be combined with the heavy-duty (HD-HRI) category and thus precluded from refueling at upgraded light-duty

⁸ https://uscar.org/download/53/hydrogen-fuel-cell/13748/2023-uscar-medium-duty-h2-infrastructure-white-paper.pdf

stations which could reduce the availability of hydrogen fuel and slow the adoption for this important class of vehicles.

The definition of medium-duty in these proposed rules is a GVWR between 8,501 and 14,000 lbs, whereas the commercial vehicle industry generally refers to medium-duty as Class 4 – 6 vehicles with a GVWR between 14,000 and 26,000 lbs. While it's clear that a light duty vehicle would typically not refuel at a Class 8 tractor trailer truck stop, and a class 8 truck would not refuel at a light duty station, Class 4-6 vehicles will benefit from refueling at both of these types of stations.

204.8

Therefore, the definition of medium-duty should be amended to also include Class 4-6 vehicles resulting in a medium duty vehicle definition with a range of GVWR from 8,501 lbs – 26,000 lbs. Additionally, since medium duty vehicles as defined in this manner will be refueling in practice at both upgraded light-duty and heavy-duty stations, medium-duty vehicles using this new definition should be included in both categories, thus creating "LMD-HRI" and "MHD-HRI" categories.

204.9 "MHD-HRI" stations should be categorized into public and private stations with a capacity credit provision available for the private stations, similar to the provision available for private "LMD-HRI" stations.

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.

204.10 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. GM appreciates CARB's clarification that site visits must be conducted annually at the "central records locations." Lastly, 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

204.11 GM supports CARB's proposed framework for the Second 15-Day Notice for 2024 Low Carbon Fuel Standard updates. As one of the key stakeholders in low carbon electricity usage 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. To: California Air Resources Board and Staff

From: Mary Elizabeth, M.S., R.E.H.S.

Dated: 10.16.2024

Re: Low Carbon Fuel Standard Regulations Revisions

205.1 The increased time for phasing out fossil fuel hydrogen production credits is prolonging the use of fossil fuel and endangering our air quality and climate with further greenhouse gas emissions, including nitrogen oxides that produce ozone a potent trigger to asthmatic episodes. Credits for hydrogen produced from fossil gas should be stopped immediately.

205.2 The continued allowance of credits for renewable methane not only affects communities far from California but go against CARBs CEQA recommendations: As a general rule, offsets purchased in the general area of the Project are preferred if onsite mitigations are insufficient as shown in the CARB Scoping Plan GHG Reduction and Mitigation Hierarchy shown on the right.¹

205.3 Recent studies bring into question the assumptions used for induced land use changes and the effects of using biofuels when whole lifecycle analyses are performed.



Land protection is something that local and state regulatory agencies are hesitant to get involved with, but research has shown that under current land use regulations, carbon dioxide emissions from biofuel production exceed those from fossil diesel combustion.²

The findings

With an average emission factor (EF) of 92 kgCO2 GJ⁻¹, we find that the production of modern biofuels, if averaged over a 30-year period, causes land-use-change emissions that are higher than those from burning fossil diesel (Fig. 1). If policymakers tax bioenergy according to these average expected emissions, that is, apply a similar carbon price to a litre of biofuels as to a litre of diesel, the total future bioenergy-induced emissions decrease, as the demand is reduced. However, we show that such a policy cannot bring down the high average emissions that are attributed to biofuels. Only strict and globally comprehensive protection of natural land will reduce the EF and hence, only then, will those biofuels that replace fossil fuels effectively reduce CO2 emissions.

When I receive notices of consideration of credits for biomass fuels shipped from overseas or across the country, I don't know how to respond, and this goes to convolutions allowed to accommodate for various industry "needs". Statements of overriding consideration have harmed disadvantaged communities and the same will occur if credits for fossil gas hydrogen and "renewable credits" mitigations are allowed to continue.
 As a member of the Stockton AB617 Steering Committee I am well aware of the regulatory and mitigation environment associated with the implementation of our CERP. As the Delta-Sierra Group Conservation Chair I am well aware of the disproportionate harms that have occurred in Stockton over many years and continues today with findings of overriding consideration that affect disadvantaged communities in Stockton, CA.

¹ Office of Planning and Research. CEQA 202 Series: Greenhouse Gas Emissions. 4.18.2023. Accessed https://opr.ca.gov/ceqa/docs/20230517-CEQA_202_GHGAnalysis_Slides.pdf

² Merfort, L., Bauer, N., Humpenöder, F. et al. State of global land regulation inadequate to control biofuel land-usechange emissions. Nat. Clim. Chang. 13, 610–612 (2023). <u>https://doi.org/10.1038/s41558-023-01711-7</u>

Air Products and Chemicals, Inc. 4000 MacArthur Boulevard, Suite 420, East Tower Newport Beach, CA 92660



www.airproducts.com

October 16, 2024

Chair, Liane Randolph Members of the Board California Air Resources Board 1001 I Street Sacramento, CA 95814

Comments submitted electronically

RE: Comments Related to the October 1st, 2024 Second 15-Day Changes

Dear Chair Randolph and fellow board members,

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 in decarbonizing transportation, but we are disappointed that the second proposed 15-day package amendments leave some impediments in place hindering market development for lower-carbon hydrogen. Our comments focus on the further refinements that are needed to support the nascent and growing clean hydrogen market and help realize California's decarbonization goals. In particular, we are requesting the Board direct necessary but targeted amendments to key provisions to ensure the greatest access and market competition for new supplies of low carbon hydrogen for California's transportation fuels market.

About Air Products

Air Products is a global company providing essential industrial gases, related equipment, and applications expertise to customers in more than 50 countries. As the world's largest producer of hydrogen, Air Products is committed to driving the energy transition through a \$15 billion global investment in clean hydrogen production capacity, including projects in California, Arizona, Texas, Louisiana, New York and other international regions.

California Climate Policy Should Drive and Support the Global Energy Transition

Air Products is on the leading edge of the global energy transition, making significant investments in developing new, low CI hydrogen production facilities to serve California's mobility markets which will enable our customers to transition. We strongly support California's climate goals and general efforts to achieve carbon neutrality by mid-century and are backing up our global sustainability commitment with billions of dollars of investment in new low carbon intensity (CI) hydrogen supply and associated distribution infrastructure.

Replacing conventional transportation fuels for drivers in the state with low CI alternatives, including low CI hydrogen, sustainable aviation fuels and diesel alternatives requires rapid scale up new hydrogen technologies for production and distribution which must be supported by regulatory certainty and strong market signals from the LCFS program.

Each of our low CI hydrogen production and distribution projects are designed for scale and to support a rapid, global transition to clean energy, including prioritizing supply options for California's hydrogen fuel cell customers and industrial customers investing in alternative low CI refining. To support these and other near-term market investments, it is critical that early growth markets – like California's clean fuels market – do not isolate themselves from the global economy and Californians have access to a broad array of low CI fuel supplies. Limiting low CI hydrogen supply to "made-in-California" mandates is counter to state goals to expand supplies, drive down the cost of hydrogen and ultimately reduce the cost to drivers who choose hydrogen fuel

206.1 cell vehicles. While California's fuel market and LCFS rules allow for equal access and competition among suppliers of fossil-based gasoline, diesel, and liquid biofuels, the same rules as proposed in the draft LCFS regulations, unfortunately, do not apply to low CI hydrogen thus disadvantaging it from fully and fairly participating in the clean fuels transition and ultimately limiting access to a broad supply base. An unequal playing field will delay the availability of low CI hydrogen for the California fuels market, increase costs for California hydrogen consumers, and hinder the energy transition.

Low CI Hydrogen Production, Handling and Delivery Requirements Should Support all Early Market Projects While Ensuring Environmental Benefits

Air Products appreciates CARB's willingness to provide a 'book-and-claim' accounting approach for CI hydrogen, and we strongly support the provision's focus on a technology-neutral, CI-focused metric to establish eligibility for low-CI hydrogen. A robust book-and-claim system for hydrogen will leverage existing infrastructure to support development of new low CI hydrogen supply, reduce costs, and ensure that the lowcarbon attributes of a hydrogen pathway are retained and applied to end-uses where the most environmental benefit can be derived. This compliance system supports the necessary, long-term signal to significantly increase investments in the production, storage, and distribution of low-carbon hydrogen that will be fundamental to decarbonizing the transportation sector. CARB's design of this system will be a model to other jurisdictions implementing LCFS programs.

To that end, one key improvement is still needed for policy conformity as it was missed during the amendment process likely due to an oversight. Specifically,

206.3 **The CARB Board should direct staff to eliminate the requirement that eligible hydrogen utilizing** book-and-claim provisions must be supplied to California in a dedicated pipeline as proposed in §95488.8(i)(3)(A).

The in-state pipeline requirement places an unnecessary constraint on a nascent market and will stifle investments at a time when significant capital outlays are needed to bring low-carbon hydrogen to scale. We are not aware of any other fuel, much less a low carbon fuel that is just beginning to ramp up production and use in California, being subject to such a requirement that discriminates against out-of-state projects.

Air Products owns and operates the only dedicated hydrogen pipeline network in California, and there are no dedicated interstate hydrogen pipelines that move hydrogen into California. This requirement that the low CI hydrogen consumed in California or used by a low CI fuel producer be transported in an in-state hydrogen pipe severely limits the eligible available supply. Further, the in-state only pipeline requirement fails to recognize the value of using hydrogen as an input for renewable fuels produced out of state and delivered for use in California, or hydrogen imported for mobility that will be produced and transported in dedicated pipelines outside of California before ultimately being transported by truck into the state. This approach inequitably dictates a project-specific design for out-of-state pipelines – where each low CI hydrogen project must have its own dedicated pipeline – rather than a scaled clean and efficient hydrogen economy where multiple production projects are able to utilize the same transportation and distribution infrastructure – including shared pipelines. Please note that this request is not to allow for a "papered attribute" system, like has been and continues to be used for biogas and renewable electricity Power Purchase Agreements, but rather for demonstrated mass balancing in a physically connected system.

206.3 Cont. For the best emissions outcomes, lowest cost, access to a larger pool of low CI hydrogen supplies and thus a reliable supply chain, California should support the use of low CI hydrogen in multiple fuel value chains and geographies as long as the finished fuel is consumed in state and creditable under the LCFS. To correct this oversight, we request that the Board ask CARB staff to modify §95488.8(i)(3)(A) as follows:

> *"Low-CI hydrogen is injected into a dedicated hydrogen pipeline physically connected to <i>California*<u>a</u> <u>distribution system or a production facility that provides transportation fuel to California."</u>

CARB Should Reconsider and Clarify Renewable Hydrogen Provisions

- ^{206.4} In response to the first 15-day change package, we expressed concern with the new requirement that all hydrogen used in mobility applications be renewable after 2030.¹ This was a substantial new requirement that was not subject to workshop discussion and places hydrogen on unequal footing with electricity as a zeroemission fuel or biogas and other pathways with longer run times to transition to new requirements, moves away from the technology-neutral approach that the LCFS has always taken, undermines the beneficial role of carbon capture and sequestration, forgoes additional emission reductions that low carbon hydrogen can provide, obviates the important work being done at CARB to develop a wide ranging market evaluation of all forms of hydrogen (including non-renewable pathways) as directed by SB 1075, and presents timing challenges for the industry to rapidly move away from existing supplies to new sources.
- 206.5 We appreciate the slight modification proposed in the second set of 15-day changes, which would impose an 80% renewable requirement by 2030 and push the fossil hydrogen ban, including low CI blue hydrogen, back to 2035. However, any restrictions on hydrogen supplies under the program – aside from specific rules on Hydrogen Refueling Infrastructure (HRI) crediting and the market-wide reduction in CI that will naturally phase out crediting for higher carbon intensity hydrogen pathways in the 2030s – are counterproductive. These restrictions create barriers to market liftoff for zero emission hydrogen fuel supplies that don't exist for other pathways, including fossil-based diesel and impede state goals to expand low CI supplies of hydrogen for fueling stations, improve supply reliability and drive down costs for consumers. Further, it is concerning that the proposal leaves significant greenhouse gas reductions on the table and stifles the rapid ramp up in hydrogen production, storage, distribution and use that is foundational to California reaching its climate change targets. We encourage CARB to reconsider this proposal, its merits and the potential for unintended consequences which would increase hydrogen costs in California and create challenges for achieving the state's Zero Emission Vehicle (ZEV) and low CI hydrogen market goals.
- 206.6 Should CARB move forward with proposed restrictions on fossil-based hydrogen pathways, we request resolution language and subsequent guidance that clarifies that the 2030 and 2035 renewable hydrogen requirements only apply to any proportional volume of hydrogen that is delivered for use in California, rather than the entirety of a hydrogen project including output utilized in markets outside of the state. We also request that the resolution language and guidelines recognize improvements to the CI of fossil hydrogen by requiring renewable credits be purchased in proportion to the residual CI of the dispensed hydrogen above a CI threshold of 0 g/MJ. This way, CI improvements for fossil hydrogen are still incented and consumer costs are minimized with respect to biomethane credit purchases when other measures to reduce the hydrogen CI have been implemented.

Additional Clarification on Other Hydrogen Provisions Would be Helpful

There are other hydrogen-related provisions that would still benefit from additional clarification. Air Products encourages Resolution language that would identify and help clarify these issues, and we look forward to continuing to work with staff to effectively implement these provisions. Specifically:

¹ <u>https://www.arb.ca.gov/lists/com-attach/7468-lcfs2024-UDEGaVAjBwsFcwR2.pdf</u>

- **Hydrogen Price Reporting Requirements:** The requirement to report hydrogen prices remains unchanged, which continues to raise concerns. We hope that further clarification will be provided in Resolution language and CARB's responses to public comments, ensuring that reporting requirements are not overly burdensome or detrimental to market competitiveness.
- HD-HRI Crediting Provisions: We support the proposed changes to HRI crediting, including adjusting the credit caps to 100% for public stations and 50% for private stations, now set against a 1,200 kg/day credit cap rather than 2,000 kg/day. In response to the first 15-day change package, we supported the proposed changes to align light- and medium-duty (LMD) stations in one category and heavy-duty (HD) in another category for generating HRI credits but requested clarification about how multi-modal stations that serve both LMD and HD vehicles will be treated within the HRI crediting framework.²

We appreciate that CARB has proposed an approach that enables stations serving both LMD and HD vehicles to apply for credits but remain concerned that there is no guarantee the LMD-HRI and HD-HRI applications will both be approved at the same time if either LMD-HRI or HD-HRI crediting have exceeded their respective 2.5% quarterly deficit caps. Also, since HRI applications are approved on a first-come first-served bases the approval timelines for LMD-HRI and HD-HRI may not occur in the same quarter of LCFS crediting. For a scenario where the HD-HRI application is approved, and LMD-HRI application is not approved because LMD-HRI credits exceed the 2.5% cap there is need to edit **Section 95486.3(a)(1)(C)2 as follows:**

Any station previously approved for HRI crediting <u>submitted before the effective date of</u> <u>the 2024 LCFS amendments or approved for LMD-HRI crediting</u>;

206.10 CARB guidance also needs to confirm that multimodal station design is supported with LMD Hydrogen Fueling Capacity Model (HyCap) and HD HyCap ratings. Based on multimodal station design and costs, the HyCap ratings are allocated based on the hydrogen dispensing capacity for LMD and HD fueling and any operating constraints. We trust that CARB will address these points in the responses to comments and through future guidance, and we look forward to working with staff to implement these new provisions.

Strong Support for Adopting the Package at the November 8, 2024 Board Meeting

Finally, we wish to reiterate our support for staff's efforts throughout this process and many amendments to the program that have been previously proposed, including:

- 206.11 The 9% step down in program stringency in 2025 and extension of the program and CI benchmarks through 2045
 206.12 Development of the Auto Acceleration Mechanism, and proposed change in the second 15-day change package to move from annual to quarterly review
- 206.13 Amendments to the provisions for low CI electricity book-and-claim to extend the existing approach to include process energy associated with other components used to process and distribute hydrogen, like liquefaction and compression, and to treat hydrogen and electricity equitably in terms of the time matching
- 206.14
 Development of a Tier 1 Hydrogen Calculator and incorporation of these new low-CI electricity book-and-claim provisions into it
 - Removal of the work "electrolytic" in subsection 95488.8(i)(1)(C), per our previous comments

206.9

206.15 We strongly encourage CARB to adopt LCFS amendments at its November 8, 2024 Board meeting, and implement the amendment package as soon as possible following adoption to ensure that the 9% stepdown in stringency takes effect in Q1 2025. We look forward to continuing to work with CARB and stakeholders to effectively implement this critical policy and advance the state's clean energy and climate change goals.

Air Products appreciates the opportunity to provide this feedback on the October 1st Second 15-day package 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



October 15, 2024

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

Dear Ms. Sahota:

Re: October 2024 15-Day LCFS Proposal

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

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.

Key Messages

207.1	•	The proposed sustainability guardrails are unnecessary and pose a threat to supply
		reliability for renewable fuels.

• The proposed feedstock cap should explicitly exclude emerging cover crops which have a different emissions and land use profile than primary crops.

- 207.4
 Reversing crediting for avoided methane runs counter to the goals of the LCFS and could cause backsliding.
 207.5
 HBL continues to have limitations with the can on HD capacity as well as the recording and
 - HRI continues to have limitations with the cap on HD capacity as well as the recording and recordkeeping requirements which add complexity.

Sustainability Guardrails

207.6 While we still oppose the introduction of sustainability criteria and believe they should be withdrawn, we want to emphasize that the most challenging and potentially disruptive proposal is the 2026 implementation date. Both U.S. and Canada planted crops have received approval from the US EPA under the aggregate compliance with renewable biomass requirement (80.1454(g)¹ and 80.1457²) for the US Renewable Fuel Standard. Canada's Clean Fuel Regulation (CFR) also provides an exemption to its crop feedstock rules for the U.S. and

² <u>https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-80/subpart-M/section-80.1457</u>



[•] Cutting off crediting for fossil-based hydrogen, penalizing it with a greater obligation, and requiring 80 vol% renewable content is punitive at a time when the industry is facing serious economic headwinds. This will deter investment in hydrogen refueling and carbon capture and sequestration projects as well as renewable hydrogen production.

¹ <u>https://www.ecfr.gov/current/title-40/part-80/section-80.1454#p-80.1454(g)</u>

Rajinder Sahota Page 2 October 15, 2024

- 207.6 Canada, based on U.S. RFS aggregate compliance (section 53³). This means that most cropbased renewable fuels consumed in North America are not mapped and tracked back to farm fields but are monitored in aggregate for any potential sustainability concerns. The only cropbased renewable fuels that are traced back to farm fields are those from foreign sources which are subject to the RFS recordkeeping (80.1454(d)(4)⁴) and reporting requirements (e.g.
 207.7 RFS0801 report⁵). It will be prohibitively challenging to map out every single farm that might supply fuel to California with less than 30 months to do so. We believe that this entire section should be removed or at least exempt U.S. and Canada crops, as they are under other North American programs. As written, the proposal will be disruptive for the California fuel market.
 - particularly for ethanol. With the number of farms, feedstock aggregators, distributors, fuel producers, and fuel suppliers involved, there may be significant volumes of product that are blocked from entering the California market because of these requirements.
- 207.8 One of CARB's stated goals at the start of this rulemaking was to better align with federal policy. These sustainability guardrails not only depart from federal policy, but they are a duplicative burden to the feedstock and fuel supply chains for renewable fuels, without any added certainty around sustainability. As a major producer of renewable fuels, we are concerned about the impact on feedstock availability and the administrative burden caused by this proposal. As a fuel supplier in California, we are more concerned about the impact on supply reliability for both biomass-based diesel and ethanol. Given that nearly all gasoline in California contains 10% ethanol, any impact on supply reliability can have a significant impact on gasoline supplies.

At a time when fuel prices are under significant scrutiny and demand in California frequently outstrips supply, regulators should be careful about adding new measures that restrict supply. In addition to assessing the economic impact of the accelerated compliance schedule, has CARB evaluated the economic impact of the reduced supply these measures may cause? Without clear evidence that there is a problem to solve, such measures can do more harm than good. We urge CARB to withdraw or defer these new requirements to allow for, at minimum, a more reasonable timeline for implementation.

Arbitrary Restrictions on Specific Feedstocks

207.9 We continue to believe the cap on certain biofuel feedstocks is unnecessary and arbitrary. No scientific rationale has been provided and the fuels subject to the cap will naturally be phased out of the program by the declining carbon intensity targets.

As the affected feedstock list is updated to add sunflower oil, CARB should also ensure that no alternative feedstocks are inadvertently included. As we mentioned in previous comments, winter canola is an emerging feedstock with a materially different emissions and land use profile that should not be covered by the 20 percent cap. We recommend adding the following definition to § 95481(a):

207.10

"Primary-Crop Canola" means canola that is the crop produced during that geographical area's main growing season. Primary-crop canola does not include canola that is grown

³ <u>https://www.canadagazette.gc.ca/rp-pr/p2/2022/2022-07-06/html/sor-dors140-eng.html</u>

⁴ <u>https://www.ecfr.gov/current/title-40/part-80/section-80.1454#p-80.1454(d)(4)</u>

⁵ [5] List of Quarterly and Annual Reports for Renewable Fuel Standard - Compliance Year 2024 | US EPA

Rajinder Sahota Page 3 October 15, 2024

207.10 (as a second crop or as a cover crop.

Cont.

The term "Primary-Crop Canola" should then be incorporated into § 95482(i) as follows:

- 207.11 Biomass-based diesel produced from soybean oil and <u>primary-crop</u> canola oil is eligible for LCFS credits for up to twenty percent combined of total biomass-based diesel annual production reporting, by company. Any reported quantities of biomass-based diesel produced from soybean oil and <u>primary-crop</u> canola oil in excess of twenty percent on a company-wide basis will be assigned a carbon intensity equivalent to the carbon intensity benchmark shown in Table 2 in Section 95484(e) for the applicable data reporting year, or the certified carbon intensity for the associated fuel pathway – whichever is greater. For companies with biomass-based diesel pathways certified prior to the effective date of the regulation and for which the percentage of biomass-based diesel produced from soybean oil and <u>primary-crop</u> canola oil was greater than 20 percent of combined reported biodiesel and renewable diesel quantities for 2023 LCFS reporting, this provision takes effect beginning January 1, 2028.
- ^{207.12} (Table 6 should be updated to indicate that the land use change value listed applies to Primary Crop Canola Biomass-based Diesel.)
- 207.13 The clarification that the feedstock cap will apply to Production, Production for Import, and Import transactions reported under the LCFS is an improvement. CARB should add Export transactions to that list to ensure that any production that enters and then leaves the state is not included.

Renewable Hydrogen Mandate

207.14 We object to the proposed language added to 95482(h) requiring that 80 percent of hydrogen dispensed as a vehicle fuel be renewable by January 1, 2030. This is the first volumetric mandate ever proposed under the LCFS, which runs counter to the design and intent of the program. Carbon intensity scores and annual benchmarks are the proper mechanisms to encourage a transition to lower-carbon solutions. An arbitrary volumetric requirement is inappropriate.

If we look at the ULSD market in California, baseline CI targets successfully drove the volumetric blending of biomass-based diesel without creating a market distortion or significant supply disruptions. The CI-based incentives drove investment in supply which then drove its end-adoption. The same is true for RNG displacing fossil-CNG and can also be true for hydrogen. No other fuel, including electricity, is held to a volumetric mandate which artificially penalizes hydrogen rather than letting it compete.

Volumetric targets are arbitrary and can have unintended consequences. In this case, the 80 percent requirement has a real chance of inhibiting investment in hydrogen fueling infrastructure. If there is uncertainty that enough renewable hydrogen will be available, why would fuel suppliers choose to invest their capital in the infrastructure to dispense it? If refueling infrastructure is threatened, why would producers invest in renewable hydrogen? If hydrogen supply is unavailable, why would end consumers purchase a fuel cell vehicle? The industry is facing a precarious situation with numerous supply and infrastructure shortages frustrating end consumers⁶.

⁶Class action suit highlights inconvenience of hydrogen fuel cell cars - Los Angeles Times (latimes.com)

Rajinder Sahota Page 4 October 15, 2024

- 207.15 Over 95% of US production of hydrogen is produced from steam methane reforming of natural gas.⁷ While new renewable hydrogen technologies have promise, it will take considerable time to develop these commercially on a large scale. Construction of large-scale facilities takes, at minimum, a 10-year cycle time for full capital project execution from final investment decision. Given that there are virtually no large-scale projects through final investment decision and permitting in California today, 2030 is far too early to implement an 80% renewable hydrogen requirement. In addition, the 80% renewable hydrogen requirement does not include CCUS-enabled hydrogen as a solution.
- 207.17 Further, the proposed language provides no procedures for measuring or enforcing this mandate. Is the 80 percent mandate measured company-wide or by facility? Is it an annual requirement? What happens if a company fails to meet the 80 percent requirement? These are not details that can be handled by guidance documents. Absent enforceable regulatory language, the proposed mandate only serves to add uncertainty for potential investors.

Fossil Hydrogen

- 207.18 Despite the five-year delay in its effective date, the cutoff of crediting for fossil-based hydrogen is still inappropriate. CARB has highlighted carbon capture and sequestration as a critical element of its Scoping Plan and there is potential for investment in CCUS-enabled hydrogen for California. If the LCFS will not reward such innovation, these investments will be discouraged.
- 207.19 Most problematic is the proposal to substitute the ULSD carbon intensity from Table 7-1 and an EER of 1.0 for hydrogen from fossil gas. There is no scientific basis for this. Most EERadjusted pathways for fossil-derived H2 are > 40 gCO2/MJ below ULSD today. This not only disallows crediting but adds a penalty for fueling hydrogen fuel cell vehicles, inhibiting meaningful progress. Without this change, traditional hydrogen will be a deficit-generating fuel by 2035 which will drive producers to lower their CI. Substituting the ULSD CI and EER artificially more than doubles those deficits.



Hydrogen Refueling Infrastructure Crediting

The modifications to the hydrogen refueling infrastructure (HRI) crediting program as part of the 15-day package still do not address the concerns raised to incentivize hydrogen infrastructure development. According to CARB's AB8 reporting, the state is consistently under-performing on hydrogen infrastructure growth due to the high costs and numerous challenges associated with

⁷ <u>USDOE FE Hydrogen Strategy July2020.pdf (energy.gov)</u>
building out hydrogen infrastructure and its value chain⁸.

207.20 While we appreciate CARB effectively renewing the LMD-HRI program, there are still problems with the design of both programs including: requiring 80 vol% renewable hydrogen (as noted above), requiring cost and revenue data, limiting HD-HRI crediting capacities, and requiring that HD-HRI stations receive capital funding from a government-run grant program.

Since these restrictions limit the overall program benefits relative to the complexity of compliance, we will continue to see weak participation in the HRI program. These short-sighted restrictions do nothing to further the industry and will continue to leave consumers frustrated by lack of supply. Private investment is needed to drive technological innovations that bring the cost of hydrogen equipment down and allow the value chain to optimize. As hydrogen station infrastructure development has stalled, so too have fuel cell vehicle sales in the state⁹.

207.21 Biogas Avoided Methane Crediting and Delivery Requirements

Chevron objects to the changes to avoided methane crediting and imposed delivery requirements. According to the EPA, anaerobic digestion provides a demonstrated, significant reduction in greenhouse gas emissions that would otherwise be released to the atmosphere and is the best manure management practice available to mitigate methane¹⁰. Limiting incentives for biogas and renewable natural gas producers is inconsistent with the Subnational Methane Action Coalition's statement of purpose, the 2021 Global Methane Pledge, and threatens the additional 2.4 MMTCO2e reductions needed per SB 1383 and California's Greenhouse Gas and Short-Lived Climate Pollutant Policy framework¹¹.

- 207.22 The timeline for avoided methane crediting is troublesome, as reviews by CARB staff for Tier 2 pathways have been extensively delayed beyond the 6 months estimated in the regulation. By restricting the avoided methane crediting period to the arbitrary timeline of the "effective date of the regulation," developers operating between the gap years of 2025 and 2030 will incur losses, discouraging investment.
- 207.23 The target of 132,000 Class 3-8 ZEVs or NZEVs is arbitrary and does not justify advancement of delivery requirements by 4 years. The ZEV or NZEVs target does not create the certainty of demand for RNG placement. Altogether, any delivery requirements are simply arbitrary —with no additional environmental benefit or grounding in the physical gas system. This change has the potential to deter growth and cause backsliding.

Automatic Acceleration Mechanism

207.24

The updates to the Automatic Acceleration Mechanism language are confusing and unnecessary. An annual review of the credit bank is sufficient and provides ample notice for regulated parties when the AAM is triggered. Further, it is unclear how the updated language in 95484(b) interacts with the original language in 95484(c). 95484(c)(2) states that "an updated benchmark schedule . . . will take effect January 1 of the calendar year after the Automatic Acceleration Mechanism was triggered." Does this mean that, if CARB announces that the AAM has been triggered on November 15, 2030, that a revised schedule would be posted on May 15, 2031, that is retroactive to January 1, 2031? These revisions also make it possible for the AAM to be triggered two years in a row, which was not the intent in the original proposal. This serves

⁸ <u>ww2.arb.ca.gov/sites/default/files/2023-12/AB-8-Report-2023-FINAL-R.pdf</u>

⁹ Class action suit highlights inconvenience of hydrogen fuel cell cars - Los Angeles Times (latimes.com)

¹⁰ Practices to Reduce Methane Emissions from Livestock Manure Management | US EPA

¹¹ Dairy Sector Workshop Presentation (ca.gov)

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207.24 only to add new uncertainty to the program and greater administrative burden for CARB staff.Cont. CARB should revert to the original language.

207.25 Validation & Verification

CARB should reconsider the site visit requirements for Quarterly Fuel Transaction Report verifications. This language insists that a site visit must occur at the central records location. Given that accounting records, spreadsheets, and nearly all product transfer documents are stored and transmitted electronically, often in cloud servers, there is no clear definition for the term "central records location." It is costly and time-intensive to require the limited number of approved verifiers to travel to physical sites to review electronic records. Site visits should be limited to situations where a review of physical operations is warranted. All other engagements can be better handled virtually to save time and resources.

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,

DK



October 15, 2024

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

Dear Ms. Sahota:

Re: October 2024 15-Day LCFS Proposal

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

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.

Key Messages

207.1	•	The proposed sustainability guardrails are unnecessary and pose a threat to supply
		reliability for renewable fuels.

• The proposed feedstock cap should explicitly exclude emerging cover crops which have a different emissions and land use profile than primary crops.

- 207.4
 Reversing crediting for avoided methane runs counter to the goals of the LCFS and could cause backsliding.
 207.5
 HBL continues to have limitations with the can on HD capacity as well as the recording and
 - HRI continues to have limitations with the cap on HD capacity as well as the recording and recordkeeping requirements which add complexity.

Sustainability Guardrails

207.6 While we still oppose the introduction of sustainability criteria and believe they should be withdrawn, we want to emphasize that the most challenging and potentially disruptive proposal is the 2026 implementation date. Both U.S. and Canada planted crops have received approval from the US EPA under the aggregate compliance with renewable biomass requirement (80.1454(g)¹ and 80.1457²) for the US Renewable Fuel Standard. Canada's Clean Fuel Regulation (CFR) also provides an exemption to its crop feedstock rules for the U.S. and

² <u>https://www.ecfr.gov/current/title-40/chapter-l/subchapter-C/part-80/subpart-M/section-80.1457</u>



[•] Cutting off crediting for fossil-based hydrogen, penalizing it with a greater obligation, and requiring 80 vol% renewable content is punitive at a time when the industry is facing serious economic headwinds. This will deter investment in hydrogen refueling and carbon capture and sequestration projects as well as renewable hydrogen production.

¹ <u>https://www.ecfr.gov/current/title-40/part-80/section-80.1454#p-80.1454(g)</u>

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- 207.6 Canada, based on U.S. RFS aggregate compliance (section 53³). This means that most cropbased renewable fuels consumed in North America are not mapped and tracked back to farm fields but are monitored in aggregate for any potential sustainability concerns. The only cropbased renewable fuels that are traced back to farm fields are those from foreign sources which are subject to the RFS recordkeeping (80.1454(d)(4)⁴) and reporting requirements (e.g.
 207.7 RFS0801 report⁵). It will be prohibitively challenging to map out every single farm that might supply fuel to California with less than 30 months to do so. We believe that this entire section should be removed or at least exempt U.S. and Canada crops, as they are under other North American programs. As written, the proposal will be disruptive for the California fuel market.
 - particularly for ethanol. With the number of farms, feedstock aggregators, distributors, fuel producers, and fuel suppliers involved, there may be significant volumes of product that are blocked from entering the California market because of these requirements.
- 207.8 One of CARB's stated goals at the start of this rulemaking was to better align with federal policy. These sustainability guardrails not only depart from federal policy, but they are a duplicative burden to the feedstock and fuel supply chains for renewable fuels, without any added certainty around sustainability. As a major producer of renewable fuels, we are concerned about the impact on feedstock availability and the administrative burden caused by this proposal. As a fuel supplier in California, we are more concerned about the impact on supply reliability for both biomass-based diesel and ethanol. Given that nearly all gasoline in California contains 10% ethanol, any impact on supply reliability can have a significant impact on gasoline supplies.

At a time when fuel prices are under significant scrutiny and demand in California frequently outstrips supply, regulators should be careful about adding new measures that restrict supply. In addition to assessing the economic impact of the accelerated compliance schedule, has CARB evaluated the economic impact of the reduced supply these measures may cause? Without clear evidence that there is a problem to solve, such measures can do more harm than good. We urge CARB to withdraw or defer these new requirements to allow for, at minimum, a more reasonable timeline for implementation.

Arbitrary Restrictions on Specific Feedstocks

207.9 We continue to believe the cap on certain biofuel feedstocks is unnecessary and arbitrary. No scientific rationale has been provided and the fuels subject to the cap will naturally be phased out of the program by the declining carbon intensity targets.

As the affected feedstock list is updated to add sunflower oil, CARB should also ensure that no alternative feedstocks are inadvertently included. As we mentioned in previous comments, winter canola is an emerging feedstock with a materially different emissions and land use profile that should not be covered by the 20 percent cap. We recommend adding the following definition to § 95481(a):

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"Primary-Crop Canola" means canola that is the crop produced during that geographical area's main growing season. Primary-crop canola does not include canola that is grown

³ <u>https://www.canadagazette.gc.ca/rp-pr/p2/2022/2022-07-06/html/sor-dors140-eng.html</u>

⁴ <u>https://www.ecfr.gov/current/title-40/part-80/section-80.1454#p-80.1454(d)(4)</u>

⁵ [5] List of Quarterly and Annual Reports for Renewable Fuel Standard - Compliance Year 2024 | US EPA

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207.10 (as a second crop or as a cover crop.

Cont.

The term "Primary-Crop Canola" should then be incorporated into § 95482(i) as follows:

- 207.11 Biomass-based diesel produced from soybean oil and <u>primary-crop</u> canola oil is eligible for LCFS credits for up to twenty percent combined of total biomass-based diesel annual production reporting, by company. Any reported quantities of biomass-based diesel produced from soybean oil and <u>primary-crop</u> canola oil in excess of twenty percent on a company-wide basis will be assigned a carbon intensity equivalent to the carbon intensity benchmark shown in Table 2 in Section 95484(e) for the applicable data reporting year, or the certified carbon intensity for the associated fuel pathway – whichever is greater. For companies with biomass-based diesel pathways certified prior to the effective date of the regulation and for which the percentage of biomass-based diesel produced from soybean oil and <u>primary-crop</u> canola oil was greater than 20 percent of combined reported biodiesel and renewable diesel quantities for 2023 LCFS reporting, this provision takes effect beginning January 1, 2028.
- ^{207.12} (Table 6 should be updated to indicate that the land use change value listed applies to Primary Crop Canola Biomass-based Diesel.)
- 207.13 The clarification that the feedstock cap will apply to Production, Production for Import, and Import transactions reported under the LCFS is an improvement. CARB should add Export transactions to that list to ensure that any production that enters and then leaves the state is not included.

Renewable Hydrogen Mandate

207.14 We object to the proposed language added to 95482(h) requiring that 80 percent of hydrogen dispensed as a vehicle fuel be renewable by January 1, 2030. This is the first volumetric mandate ever proposed under the LCFS, which runs counter to the design and intent of the program. Carbon intensity scores and annual benchmarks are the proper mechanisms to encourage a transition to lower-carbon solutions. An arbitrary volumetric requirement is inappropriate.

If we look at the ULSD market in California, baseline CI targets successfully drove the volumetric blending of biomass-based diesel without creating a market distortion or significant supply disruptions. The CI-based incentives drove investment in supply which then drove its end-adoption. The same is true for RNG displacing fossil-CNG and can also be true for hydrogen. No other fuel, including electricity, is held to a volumetric mandate which artificially penalizes hydrogen rather than letting it compete.

Volumetric targets are arbitrary and can have unintended consequences. In this case, the 80 percent requirement has a real chance of inhibiting investment in hydrogen fueling infrastructure. If there is uncertainty that enough renewable hydrogen will be available, why would fuel suppliers choose to invest their capital in the infrastructure to dispense it? If refueling infrastructure is threatened, why would producers invest in renewable hydrogen? If hydrogen supply is unavailable, why would end consumers purchase a fuel cell vehicle? The industry is facing a precarious situation with numerous supply and infrastructure shortages frustrating end consumers⁶.

⁶Class action suit highlights inconvenience of hydrogen fuel cell cars - Los Angeles Times (latimes.com)

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- 207.15 Over 95% of US production of hydrogen is produced from steam methane reforming of natural gas.⁷ While new renewable hydrogen technologies have promise, it will take considerable time to develop these commercially on a large scale. Construction of large-scale facilities takes, at minimum, a 10-year cycle time for full capital project execution from final investment decision. Given that there are virtually no large-scale projects through final investment decision and permitting in California today, 2030 is far too early to implement an 80% renewable hydrogen requirement. In addition, the 80% renewable hydrogen requirement does not include CCUS-enabled hydrogen as a solution.
- 207.17 Further, the proposed language provides no procedures for measuring or enforcing this mandate. Is the 80 percent mandate measured company-wide or by facility? Is it an annual requirement? What happens if a company fails to meet the 80 percent requirement? These are not details that can be handled by guidance documents. Absent enforceable regulatory language, the proposed mandate only serves to add uncertainty for potential investors.

Fossil Hydrogen

- 207.18 Despite the five-year delay in its effective date, the cutoff of crediting for fossil-based hydrogen is still inappropriate. CARB has highlighted carbon capture and sequestration as a critical element of its Scoping Plan and there is potential for investment in CCUS-enabled hydrogen for California. If the LCFS will not reward such innovation, these investments will be discouraged.
- 207.19 Most problematic is the proposal to substitute the ULSD carbon intensity from Table 7-1 and an EER of 1.0 for hydrogen from fossil gas. There is no scientific basis for this. Most EERadjusted pathways for fossil-derived H2 are > 40 gCO2/MJ below ULSD today. This not only disallows crediting but adds a penalty for fueling hydrogen fuel cell vehicles, inhibiting meaningful progress. Without this change, traditional hydrogen will be a deficit-generating fuel by 2035 which will drive producers to lower their CI. Substituting the ULSD CI and EER artificially more than doubles those deficits.



Hydrogen Refueling Infrastructure Crediting

The modifications to the hydrogen refueling infrastructure (HRI) crediting program as part of the 15-day package still do not address the concerns raised to incentivize hydrogen infrastructure development. According to CARB's AB8 reporting, the state is consistently under-performing on hydrogen infrastructure growth due to the high costs and numerous challenges associated with

⁷ <u>USDOE FE Hydrogen Strategy July2020.pdf (energy.gov)</u>

building out hydrogen infrastructure and its value chain⁸.

207.20 While we appreciate CARB effectively renewing the LMD-HRI program, there are still problems with the design of both programs including: requiring 80 vol% renewable hydrogen (as noted above), requiring cost and revenue data, limiting HD-HRI crediting capacities, and requiring that HD-HRI stations receive capital funding from a government-run grant program.

Since these restrictions limit the overall program benefits relative to the complexity of compliance, we will continue to see weak participation in the HRI program. These short-sighted restrictions do nothing to further the industry and will continue to leave consumers frustrated by lack of supply. Private investment is needed to drive technological innovations that bring the cost of hydrogen equipment down and allow the value chain to optimize. As hydrogen station infrastructure development has stalled, so too have fuel cell vehicle sales in the state⁹.

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Chevron objects to the changes to avoided methane crediting and imposed delivery requirements. According to the EPA, anaerobic digestion provides a demonstrated, significant reduction in greenhouse gas emissions that would otherwise be released to the atmosphere and is the best manure management practice available to mitigate methane¹⁰. Limiting incentives for biogas and renewable natural gas producers is inconsistent with the Subnational Methane Action Coalition's statement of purpose, the 2021 Global Methane Pledge, and threatens the additional 2.4 MMTCO2e reductions needed per SB 1383 and California's Greenhouse Gas and Short-Lived Climate Pollutant Policy framework¹¹.

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⁸ <u>ww2.arb.ca.gov/sites/default/files/2023-12/AB-8-Report-2023-FINAL-R.pdf</u>

⁹ Class action suit highlights inconvenience of hydrogen fuel cell cars - Los Angeles Times (latimes.com)

¹⁰ Practices to Reduce Methane Emissions from Livestock Manure Management | US EPA

¹¹ Dairy Sector Workshop Presentation (ca.gov)

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CARB should reconsider the site visit requirements for Quarterly Fuel Transaction Report verifications. This language insists that a site visit must occur at the central records location. Given that accounting records, spreadsheets, and nearly all product transfer documents are stored and transmitted electronically, often in cloud servers, there is no clear definition for the term "central records location." It is costly and time-intensive to require the limited number of approved verifiers to travel to physical sites to review electronic records. Site visits should be limited to situations where a review of physical operations is warranted. All other engagements can be better handled virtually to save time and resources.

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,

DK

October 16, 2024

Chair Liane Randolph & Members of the Board California Air Resources Board 1001 | Street Sacramento, CA 95814

Via electronic submission

Re: Second 15-Day Changes to the Proposed Regulation Order

Dear Chair Randolph and Members of the California Air Resources Board:

The Arkansas Soybean Association appreciates the opportunity to comment on the proposed modifications (Second 15-Day Changes) to the Low Carbon Fuel Standard (LCFS) program. ASA has welcomed engagement with the California Air Resources Board (CARB) and staff throughout this multi-year process to update the LCFS program.

208.1 CARB's Second 15-Day Changes to revise the LCFS did not address our major concerns with
 208.2 provisions included in the August 15-day notice nor did it provide additional clarification or detail
 208.3 additional flexibility reporting requirements for agricultural feedstocks. We do appreciate the
 208.3 additional flexibility related to virgin vegetable oil feedstock limitations, by extending the
 208.4 However, additional feedstock limitations included in the Second 15-Day Changes document
 208.4 could further limit soybean oil market share in California, when compared to the August proposal.

In addition to the new proposals in the Second 15-Day Changes package, the Arkansas Soybean
 Association remains deeply concerned with the drastic pivot CARB has made in the past few months related to agricultural feedstocks used for biofuels. We continue to encourage that updates to the LCFS program are based on science, as required by AB-32.

Amended Feedstock Cap Considerations

208.6 The Arkansas Soybean Association has significant concerns with the virgin vegetable oil feedstock cap that was included in the initial 15-Day Changes posted in August, especially after CARB itself noted that a cap will increase the utilization of petroleum diesel. The current proposal limits, or caps, the amount of soybean oil that is allowed to generate credits in the program at an arbitrary 20%. Now, CARB is expanding on this cap in its Second 15-Day Changes with the inclusion of sunflower oil. Adding additional feedstocks to the 20% aggregate cap will further limit market access for soybean oil and additional gallons of low-carbon fuels.

208.6 Based on CARB's own analysis, a cap on credit generation for vegetable oil feedstocks will lead to an increase in fossil diesel use compared to the status quo. While the Arkansas Soybean Association agrees that all feedstocks entering the California LCFS market should maintain fidelity to the assumptions underlying their life-cycle assessment (LCA), domestic agricultural feedstocks are facing a redundant, triple penalty through an outdated indirect land use change (ILUC) score, stringent sustainability reporting requirements, and a proposed arbitrary cap on credit generation while all other feedstocks, including imports, do not face the same restrictions.

The proposed cap increases soy's carbon intensity (CI) score for amounts over the cap from the established pathway, which is based on science, to the benchmark CI, which is not based on an LCA for soy. This is effectively increasing soy's ILUC score by upwards of 50% for many pathways without a scientific basis. In fact, CARB has refused to use new data related to ILUC while at the same time effectively increasing it by an arbitrary amount.

- The increase in ILUC for ag feedstocks above the 20% threshold will effectively shut them out of the LCFS. Biomass-based diesel provides GHG and emissions benefits that are unpriced by the market. As a result, they cost more to produce than they can be sold for and rely on policy to account for these benefits. Without the credit generation, soy will not be able to compete against waste feedstock imports, thereby capping use in the LCFS.
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 North American agricultural feedstocks for biofuel production are already held to a high standard for participation in the Renewable Fuel Standard (RFS) and the Canadian Clean Fuels
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While the Arkansas Soybean Association is steadfast in its opposition to the virgin vegetable oil feedstock cap and the rationale used to reach this conclusion, the Second 15-Day Changes added some additional flexibility to come into compliance with the arbitrary cap. We appreciate CARB's acknowledgement that biofuel production facilities cannot shift production overnight, and thank CARB for updating the grandfathering clause to provide a 2028 compliance date for all approved pathways in the LCFS program.

Carbon Intensity Scoring and Auto Acceleration Mechanism

The Arkansas Soybean Association remains concerned that without a comprehensive update to the Global Trade Analysis Project model for biofuels (GTAP-BIO) that CARB utilizes, soy-based feedstocks will be phased out of the LCFS even without the additional limitations being proposed in the Second 15-Day Changes. Current data indicates a much lower CI score for soybeans, as growers continue to improve soil practices, limit water use, lower on-farm emissions and more. On the one hand, CARB is recommending stringent sustainability guardrails for U.S. soy, but on the other hand is still on track to likely phase-out soy-based biofuels from credit generation by approximately 2035 or sooner. 208.13 cont. As CARB looks to develop a more aggressive auto acceleration mechanism to reach CI reduction benchmarks sooner, using outdated methodologies will only limit the output of actual improvement over time in terms of emissions reductions. As CARB updates all other major lifecycle emissions models through this rulemaking, we once again urge action to update the GTAP-BIO model so that the most current, science-based data may be used to determine carbon intensity reductions.

In terms of updating the timeline for analysis of data to trigger the auto acceleration mechanism,
 the Arkansas Soybean Association appreciates that CARB is seeking to provide additional notice to the market before a trigger is implemented through the ability to analyze data quarter over quarter rather than just annually. This will allow the industry more time to plan and make business decisions ahead of new benchmarks triggering.

Sustainability Guardrails and Traceability Concerns

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 The Arkansas Soybean Association remains very concerned about the sustainability guardrails. The sustainability guardrails are more onerous than the specified source requirements used for waste feedstock imports. Palm oil in Southeast Asia has had forced labor concerns¹, but CARB does not require used cooking oil derived from palm to track social or economic sustainability. Concerningly, petroleum also does not have to track these criteria. CARB's proposal makes it administratively easier to use non-sustainable petroleum² in the state than biofuels that have lower CI scores and are produced from sustainable feedstocks grown in the United States. Land use change is already captured in the ILUC score, which makes it unclear what purpose the guardrails serve.

The Second 15-Day Changes offered a bit more detail about how CARB plans to implement its reporting and requirements in terms of traceability, but we continue to have serious concerns about how this proposal will work in practice. By way of background, soybean products pass through many hands before final use. A soybean is produced, potentially transported to a grain elevator, then must reach a soybean processor to be separated into soybean oil and soybean meal (crushed). The meal and oil can then be delivered to end users. Because of this, ensuring the identity preservation of a soybean is not easily accomplished. Soybeans are a bulk commodity, and infrastructure in the U.S. was not developed to segregate subunits of the crop. This bulk handling system based on comingling is one of the inherent advantages the United States has as it reduces transportation costs, and subsequently on-ground emissions.

CARB's proposal states that farmers will have to declare the geographical shapefiles or
 coordinates of farm boundaries starting in 2026. This raises many issues including the definition
 of a farm and how grain must be traced and reported if harvested from several fields but
 comingled at storage. While the deforestation requirements do not start until 2028, the questions

¹ https://apnews.com/article/virus-outbreak-only-on-ap-indonesia-financial-markets-malaysia-7b634596270cc6aa7578a062a30423bb

² https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2022.858512/full

posed above are relevant for the attestations starting in 2026. At that point, farmers will have to declare the boundaries of their farm. CARB settling on one definition for 2026 and another for 2028 would create much confusion. Educational efforts will be needed ahead of 2026. Once farmers understand the program, it will be very difficult to change fundamental definitions.

208.18 cont.

While 2026 may seem like plenty of time, it is much less for farmers in practice. Soybeans available starting at the beginning of 2026 are from the crop harvested in the fall of 2025 and planted in the spring of 2025. Farmers are purchasing inputs for that crop currently. If delivery points for the next soybean crop require data disclosure, producers need to know that now as they plan out their upcoming crops and lock in investments. So, if new LCFS regulations are not finalized until January 2025 and planting begins in March 2025, it leaves virtually no planning time for a farmer to update practices to adhere to these new attestation requirements.

208.19

If CARB insists on agricultural feedstock traceability, then it should reward sustainable practices beyond what is already assumed in the LCA. For instance, some soybeans are double cropped meaning they are grown as a secondary crop following a primary crop within a growing season. They are not displacing other crops or land uses. Double-crop soybeans should be eligible to have the ILUC component of the CI score removed, or at least shared with the other crop in the rotation.

Entities Eligible to Apply for Fuel Pathways

The Arkansas Soybean Association is concerned about CARB's proposal to give the Executive Officer the discretion to stop accepting new pathways for biomass-based diesel starting in 2031. We do not understand how this benefits the LCFS. Under AB-32, CARB must under statute minimize costs and maximize GHG reductions. It is unclear how this is served by rejecting new pathways. In fact, the LCFS is best served by allowing the most available pathways. If these pathways cannot achieve cost-effective GHG savings, they will not be utilized by the market in the LCFS. In essence, an increase in pathways can only serve to improve GHG benefits in California. Singling out a single fuel for prejudicial treatment is baffling given the goals of the LCFS and the authority that establishes it.

Recommendations to CARB

As CARB finalizes its update to the LCFS, the Arkansas Soybean Association aligns itself with the 208.21 American Soybean Association (ASA) recommendations that will likely prevent an increase in fossil diesel use, improve carbon intensity calculations, and improve market access for sustainable agricultural feedstock providers.

First, CARB should not apply the vegetable oil feedstock cap proposal to North American feedstocks. As noted above, these feedstocks are already subject to guardrails to ensure production on land that has not been converted since 2008. The RFS was designed specifically to prevent land conversion for biofuel production, and U.S. Department of Agriculture (USDA) data shows a decrease in farmland over the same period. Second, CARB should convene an expert working group to consider issues related to the sustainability provisions and indirect land use change. CARB has utilized working groups in the past to analyze complex issues related to the LCFS and this is no different. Through meetings with CARB staff and board members, decisions are being made using competing schools of thought. Gathering experts to coalesce around an agreed upon science-based approach moving forward would ensure that CARB is utilizing the best information available. We recommend that this expert working group convenes in 2025 and provide recommendations by October 2026.

208.24 Lastly, CARB must undertake a comprehensive update of the GTAP-BIO model for soybean oil used in biofuel production. Without using the most up-to-date and accurate data, CARB is doing a disservice to the feedstock producers and California's citizens by calculating carbon intensity scores not rooted in current fact. Through CARB's own analysis we know that basing decisions off old data will lead to more—not less—emissions in the California transportation sector.

Conclusion

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 The Arkansas Soybean Association is encouraged by the continued successes of programs that support the development of cleaner, low-carbon fuels. However, it is critical that CARB finalizes updates in a way that does not arbitrarily exclude agricultural feedstocks through policies that are not science-based and run afoul of CARB's mandate, including capping vegetable oil feedstocks and applying onerous sustainability guardrails that add cost without rewarding farming practices that lower CI.
- 208.27 CARB's Second 15-Day Changes did not address any of the fundamental issues raised by soybean farmers in the first 15-Day Changes and fails to acknowledge the potential unintentional consequences of a feedstock outlined by its own employees only a few months before. CARB is required under the law to achieve the maximum technically feasible and cost-effective
 208.29 reductions in GHGs. The two most recent 15-Day Changes show a lack of willingness to achieve the statutory obligations set forth in AB-32.

The Arkansas Soybean Association is eager to continue working with CARB to support the role of agriculture in diversifying the fuel supply while reducing GHGs and increasing clean air 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,

Derek Helms

Derek Helms Arkansas Soybean Association President



October 15, 2024

California Air Resources Board 1001 I Street Sacramento, CA 95814 *Via electronic submission*

RE: Second 15-Day Notice of Changes to the LCFS

Dear California Air Resources Board,

Christianson PLLP is a full-service public accounting firm based in Willmar, Minnesota, with over 30 years of experience serving the renewable fuels industry. We specialize in providing technical assistance and professional services that ensure compliance with regulatory programs and support sustainable practices.

As a third-party verification body working extensively with biofuel producers under the Low Carbon Fuel Standard (LCFS), we appreciate the opportunity to comment on the proposed changes outlined in the second 15-day notice.

209.1 We respectfully urge the Board to reconsider the requirement that Quarterly Fuel Transaction Report (QFTR) site visits must occur exclusively at the central records location. To enhance efficiency and flexibility, we recommend revising the language as follows:

Suggested QFTR Site Visit Language Change:

"For Quarterly Fuel Transaction Reports (QFTR), the site visit must take place at the central records location, or another location owned by the regulated party where records relevant to the QFTR may be accessed."

Justification:

 Operational Efficiency: Verification bodies frequently conduct annual fuel pathway verification site visits where access to the necessary records is already provided at a company's production facility rather than its headquarters.
 Requiring a separate visit to the central records location adds unnecessary time and effort.

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- Reduction of Costs and Burden: Allowing site visits to a location where records are readily accessible would save both the verification body and the regulated party time, reduce costs and streamline the verification process. This flexibility would eliminate redundant travel without compromising the accuracy and integrity of the verification.
 - Environmental Benefits: Reducing the need for separate site visits to the central records location would decrease travel-related greenhouse gas (GHG) emissions, aligning with the overall goals of the LCFS to minimize the carbon footprint of fuel lifecycle activities.

We believe these changes will significantly improve the efficiency of the verification process while maintaining the high standards of the LCFS program. We respectfully request that the Board adopt the suggested language in the final regulation.

Thank you for your time and consideration. Should you have any questions or require further information, please do not hesitate to contact us.

Sincerely,

Kani Beilichiff, CPA

Kari Buttenhoff, CPA Partner, Christianson PLLP

Christianson PLLP 302 5th St. SW Willmar, MN 56201



Dairy Cares and Agricultural Council of California Comments on the Proposed Low Carbon Fuel Standard Amendments (Second Set of 15-Day Changes)

October 16, 2024

Dairy Cares¹ and the Agricultural Council of California ("Ag Council")² appreciate the opportunity to provide these comments on the second set of 15-day Changes to the California Air Resources Board's ("CARB") proposed Low Carbon Fuel Standard ("LCFS") amendments ("Amendments"). Dairy Cares represents the California dairy sector, including dairy producer organizations, leading cooperatives, and major dairy processors. The Agricultural Council of California is a member-supported organization advocating for more than 15,000 farmers across California, ranging from farmer-owned businesses to the world's best-known brands. We appreciate CARB's efforts to lead a robust stakeholder process and to prepare a substantial record in support of the proposed revisions to the LCFS. These comments express support for the changes to provide dairy biomethane projects with longer term certainty for investments in methane reduction measures. We also recommend recognizing linear generators as an eligible electric book-and-claim pathway.

1. Dairy Cares and the Ag Council Support the Proposed Revisions to Section 95488.9(f).

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Revisions to Section 95488.9(f) of Title 17 of the California Code of Regulations would clarify that biomethane projects breaking ground prior to 2030 would be eligible to seek approval of an additional crediting period. Dairy Cares and the Ag Council appreciate and support this important clarification. As CARB recognized in its May 30, 2024 response to the March 1, 2024 *Petition for Rulemaking to Regulate Methane and Other Air Pollutants from California Livestock*, methane emissions must be further reduced, but CARB "must also follow the appropriate process before initiating a rulemaking pursuant to SB 1383, which requires more

¹ For more information about Dairy Cares, please visit <u>www.dairycares.com</u>.

² For more information about the Ag Council, please visit <u>https://agriculturalcouncil.com/</u>.

210.2 Cont. actions before regulations can be designed, adopted, and implemented."³ As explained in our prior comments in this rulemaking record, dairies are making substantial progress towards the Senate Bill 1383 targets, but will require long-term financial support to justify ongoing investments and continued operation of existing digesters to achieve these targets. The proposed revisions will help provide greater certainty for these important short-lived climate pollutant ("SLCP") reduction efforts.

2. Section 95488.8(i) Should Be Expanded to Recognize Linear Generators.

Section 95488.8(i)(2) would be amended to include book-and-claim accounting of 210.3 biomethane to produce electricity for electric vehicle charging, provided the electricity is generated using a fuel cell. We support this change because it will provide incentives that will help align the State's SLCP reduction targets with the State's priorities for vehicle electrification. We recommend also recognizing linear generators as eligible fuel cell power plants, consistent with the U.S. Treasury's definition contained in the Federal Register. Linear generators have similar energy and capacity attributes as traditional fuel cells, and can run on renewable fuels, such as dairy biogas and hydrogen. State law was recently amended to expressly include linear generators using renewable fuels, and recognizing this technology in Section 95488.8(i) would create consistency with other Renewables Portfolio Standard-eligible resources recognized in that subsection.⁴ This would also further the fundamental program objectives related to the transportation fuel sector. As a source of electricity, linear generators, like other technologies using electrochemical or electromechanical means, can further the State's objectives for vehicle electrification and provide new opportunities to significantly reduce SLCPs when running on feedstocks with a high methane profile, such as dairy biogas.

Dairy Cares and the Ag Council appreciate the opportunity to comment on this rulemaking and look forward to continuing to partner with CARB and other stakeholders on the implementation of the Amendments and the successful achievement of the State's climate goals.

³ See CARB Response to Petition for Rulemaking (May 2024), available at: <u>https://ww2.arb.ca.gov/sites/default/files/2024-05/2024-05-30-CARB-CDFA-Response-to-Dairy-Rulemaking-Petition.pdf</u>.

⁴ See Cal. Pub. Res. Code Sec. 25741, as amended by Assembly Bill 1921 (Papan, 2024 Stats).



October 15, 2024

California Air Resources Board 1001 I Street Sacramento, CA 95814

RE: Proposed Low Carbon Fuel Standard Amendments issued October 1, 2024

Dear Chairperson Randolph,

EcoEngineers is a consulting, auditing, and advisory firm with an exclusive focus on the energy transition. The firm was established in 2009 to steer low-carbon fuel producers through the complexities of emerging energy regulations in the United States. Today, EcoEngineers' global team is shaping the response to climate change by advising businesses across the energy transition. EcoEngineers appreciates the opportunity to comment on the proposed LCFS amendments issued October 1, 2024.

EcoEngineers' team of scientists, engineers, and auditors are honored to have served as an accredited verification body since the inception of the LCFS third-party verification program. In response to the proposed 2024 LCFS Amendments and comments submitted by other verification bodies, we are writing to convey our views on the firm rotation topic. The existing regulations within the LCFS verification program stipulate a mandatory rotation of audit firms every six years to assess participants' carbon intensity (CI) and fuel quantities compliance. Our request is that CARB amend the mandatory firm rotation regulation to include an exception for American National Standards Institute (ANSI) National Accreditation Board (ANAB) verification bodies. Of the 30 approved LCFS verification bodies, there are at least six verification bodies accredited by ANAB.

EcoEngineers has been granted <u>accreditation</u> by ANAB in accordance with the following International Organization for Standardization (ISO) standards ISO/IEC 17029:2019 Conformity assessment — General principles and requirements for validation and verification bodies; ISO 14065:2020 — General principles and requirements for bodies validating and verifying environmental information; and ISO 14064-3:2019 Greenhouse gases (GHG) — Part 3: Specification with guidance for the verification and validation of greenhouse gas statements. The specific scope of accreditation granted to EcoEngineers is the Verification of assertions related to GHG emission reductions and removals at the project level for project activities under ANAB scope 01- GHG emission reductions from fuel combustion and verification of applications and reports under the Canadian Clean Fuel Regulations, Sector 2 – Renewable/Bio/Low-CI Fuels.

This accreditation allows EcoEngineers to provide organizations and their stakeholders, including board members and investors, with the assurance, credibility, quality, rigor, and continuous improvement they need to reduce risk. Additionally, this assurance will support a GHG project's ability to substantiate its GHG statements. EcoEngineers joins an elite group of ANAB accredited Validation and Verification Bodies (VVBs) that identify



risks, review methods of data collection and reporting, and evaluate the robustness of data management systems in place to ensure accurate and transparent GHG reporting.

We assert that this accreditation, in conjunction with our LCFS verification body status, exceeds the standards in place for verification bodies and CPA firms as we are subject to additional oversight on GHG verification practices through the annual office and witness assessments conducted by ANAB-certified assessors to maintain accreditation status. Considering the rigorous quality standards and oversight we are bound to by ANAB, we propose that firms who hold this accreditation should not be subject to the sixyear verification body rotation. Our standard practice is to rotate lead verifiers assigned to each verification project to ensure biases cannot form. We recommend that those exempt from company rotation, are instead required to rotate the lead verifier assigned to each project at least every six years.

EcoEngineers is subject to a third-party annual attest engagement (agreed-upon procedures) performed by a CPA Firm to evaluate EcoEngineers' compliance with EPA's Renewal Fuel Standard (RFS) Quality Assurance Plan (QAP) program regulations. The annual attest report compares the list of compliance reports submitted to EPA during the compliance period to the RFS regulation reporting requirements and checking EcoEngineers verification reports covered by approved QAP under the regulation.

- 211.3 Additionally, as stated in previous comments, EcoEngineers has concerns regarding CARB's proposed approach to regulating the following topics under the proposed amendments: the 20% limit for soy and canola renewable diesel/biodiesel-based fuels, the proposed sustainability requirements for biomass, and the approach to determining land use change risks.
- 211.4 EcoEngineers is concerned with the ability of pathway holders to meet the proposed sustainability requirements without additional details on what is needed to demonstrate compliance. There could be an immense administrative and economic burden due to certification requirements that many producers may be unable to satisfy. As an accredited LCFS auditor, we have first-hand experience that clarity in compliance requirements is of utmost importance as we attempt to retrieve and review all necessary documentation during a verification.
- 211.5 EcoEngineers also requests clarification on the definition of regions with "higher LUC risk." Since GTAP geographical levels are based on 18 agro-ecological zones (AEZs), EcoEngineers requests clarification on which AEZs and counties are considered higher LUC risk. This will ensure consistency across ILUC estimates.
- 211.6 Finally, as biomass-based feedstocks are the most feasible solution to decarbonizing (transportation (on-road, aerial, and marine) in the short and medium term, EcoEngineers objects to the 20% cap on soy, canola and sunflower renewable diesel/biodiesel-based (fuels.

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Instead of setting a cap on two of the most successful feedstocks and creating additional administrative burdens for producers, EcoEngineers recommends CARB convene a committee dedicated to addressing how the energy in purposely grown feedstock can be harnessed ecologically. Emissions from land-use change, impact on food and feed markets, and a commitment to biodiversity and sustainability should be studied to understand how to cultivate low-carbon feedstock for fuel. This committee can provide recommendations for how these necessary fuels can be produced in the most sustainable, ecologically sound manner.

EcoEngineers would like to thank CARB for its time and consideration of our comments. Please let us know if you have any questions.

Sincerely,

Shashi Menon CEO



VIA ELECTRONIC FILING

October 16, 2024

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

Re: Anew Climate Comments on the Proposed Low Carbon Fuel Standard Second 15-Day Amendments

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 would like to thank the California Air Resources Board ("CARB") and its staff for the hard and diligent work associated with proposed amendments to the LCFS in response to the 2022 Scoping Plan Update. Anew shares CARB staff's dedication to ensuring that the LCFS continues to play a significant role in decarbonizing California's transport sector and helping California achieve its ambitious climate goals. We have appreciated the multiple opportunities available to engage in the process with written comments. Anew supports key features of the proposed LCFS revisions. However, we urge CARB to reconsider certain RNG-specific provisions during the implementation phase and future LCFS rulemakings.

We Support Key Features of the Proposed LCFS Revisions

Anew supports many of the key features in the proposed LCFS revisions that are intended to make the program more effective and durable by ensuring continued investment in low-carbon fuels and fuel technologies. We support the following proposals:

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• **The immediate step-down of CI targets by 9%, effective January 1, 2025**, because this is critical to the LCFS program's continued success. This is one of the most consequential and important steps CARB is taking in this rulemaking process, and it is vital to the future of the LCFS program.

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- The 30% reduction in carbon intensity by 2030, because this sets 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 are also supportive of the proposal to smooth out the compliance target curve between 2025 and 2030 as included in the 15-Day Package.
- **The Automatic Acceleration Mechanism**, because it will bring additional stability to the market. We also support the recent proposed change to perform a look back covering the previous four quarters worth of data on a quarterly basis (instead of once per calendar year). This allows the AAM to be triggered up to three quarters sooner, giving more notice to market participants and providing market certainty for both low carbon fuel producers and obligated parties. To avoid confusion, we suggest CARB clarify that the benchmark schedule update to the LCFS website and AAM trigger announcement occur at the same time.
- **The Full Credit True-up** for temporary pathways, because such a concept can ensure that the LCFS program correctly accounts for the full GHG benefits all fuel pathways produce.

Along with the revisions noted above, we would like to express our appreciation to CARB staff for reiterating its support for RNG throughout the informal workshop process and in the proposed 45-day and the two 15-day changes. We also appreciate CARB's continued recognition that LCFS crediting does not incentivize increased farm sizes, and we urge the Board to stay the course towards realizing the full climate benefit of the substantial investments made to avoid methane emissions to date, providing investors with the clarity and confidence necessary for continued development.

We Encourage Additional Engagement on RNG Issues During the Implementation Phase and in Future LCFS Revisions

We would like to highlight a few RNG-related issues that should be addressed in the implementation phase of the proposed LCFS revisions, or in future regulatory revisions made in the near term. During the implementation phase and future rulemakings, we urge CARB to remain true to the principles of fuel neutrality, basing LCFS crediting on science and carbon intensity scores, and to leverage the program to continue driving private investment into low carbon fuels and technologies, which requires near-and long-term investment certainty. Anew looks forward to continued engagement with CARB staff on these points.

- 1. We Continue to Oppose Any Arbitrary End Date for Avoided Methane Crediting and Oppose Reduction of Eligible Crediting Periods from Three to Two
- 212.7 We strongly urge CARB to refrain from imposing any arbitrary end-date for avoided methane crediting. We opposed the staff proposal in the first 15-Day Package to cut down the number of

212.7 Cont. avoided methane crediting periods from three to two for projects that break ground before January 1, 2030. In the second 15-Day Package, staff clarified that projects that are certified before the effective date of the proposed revisions would be eligible for three consecutive crediting periods. We oppose limiting eligibility to to "certified" projects because it is not clear in this context what "certified" means, and this change could significantly impact existing projects. This is true especially for projects that have already been in operation for several years and which could <u>unexpectedly</u> have less than a full crediting period of eligibility remaining. This limitation would punish early-mover projects that originally operated in the voluntary market, making the continued operation of such projects highly uncertain and potentially leaving important methane abatement opportunities unrealized.

While we oppose putting any end-date on avoided methane crediting, we recognize that CARB has faced unsubstantiated criticism and repeated calls for an immediate or near-term phase-out. We have previously applauded CARB for taking a measured position in support of avoided methane crediting generally and opposing any near-term phase out. Cutting down the number of crediting periods from three to two is a step in the wrong direction. We strongly urge CARB to clarify how existing projects may benefit from three consecutive crediting periods during the implementation phase of the proposed LCFS revisions.

2. We Oppose Flow Direction Requirements for Delivery

212.8 CARB should maintain eligibility for delivery of biomethane from all sources. We therefore oppose CARB's proposal to impose directional flow requirements on deliveries from biomethane projects that break ground in 2030 or later. We further oppose the new proposal in the 15-Day Package to pull the deadline for indirect accounting of bio-CNG, bio-LNG, and bio-LCNG forward from December 31, 2040 to December 31, 2037, depending on progress toward full implementation of the State's medium and heavy duty zero emission vehicle regulations.

We appreciate that CARB has resisted pressure to include immediate directional flow requirements for biomethane pathways, and that the proposal would not impact any biomethane fuel pathways for projects that break ground before January 1, 2030. However, we do not agree with CARB's decision to impose directional flow requirements on deliveries from biomethane projects that break ground in 2030 or later. Given the realities of the interconnected U.S. gas market, the 50% directional flow requirement is arbitrary and provides preferential treatment to fossil gas imported to California relative to imported RNG.

We would like to continue to engage with CARB staff on this point with a view to include modifications in future LCFS revisions.

3. We Oppose the 4x Penalty for CI Exceedance

212.9 We continue to oppose the proposed approach requiring a 4x "pay back" in cases where a verified CI exceeds the certified CI. As we have stated previously, this is overly punitive and not symmetrical. Instead, we recommend that if the verified CI is higher than the certified CI, the project should simply repay CARB for any excess credits claimed, and not be subject to any further

212.9 Cont. enforcement liability unless there is malfeasance or other conduct contrary to the objectives of the program.

Anew is proactively developing an updated CI management approach to ensure we continue to provide maximum value recognition potential to our partners coupled with compliance risk mitigation. We would appreciate the opportunity to continue engaging with CARB staff on this topic during the implementation phase and future anticipated LCFS revisions.

4. We Urge CARB to Improve Aspects of the Tier 1 CI Calculator for Dairy and Swine Manure Biomethane During Implementation of the LCFS Revisions

212.10 Anew requests that CARB allow fuel pathway applicants to submit site specific inputs to demonstrate digester leakage emissions on the 'Avoided Emissions' tab. This would allow projects to provide actual operating values that may differ from the default values of 2% for enclosed vessels and 5% for covered lagoons.

Entry of Site-Specific Cleanout Frequency in Tier 1 Calculator or via Tier 2 Application

212.11 Regarding GREET inputs for L1. (1-6).14 Retention Time and Drainage, it is Anew's understanding that in the proposed GREET calculator for each September, "System Emptied in This Month" must be selected by the fuel pathway applicant. This assumption requires that all projects model their operations to include a complete annual cleanout of volatile solids. A complete annual cleanout is currently only required as a baseline assumption for greenfield projects in Table A.10 of the Compliance Offset Protocol for Livestock Projects.

The implementation of this proposed default assumption could result in non-greenfield projects being certified with a carbon intensity that is not representative of normal operating conditions. It could also result in a project's baseline methane emission levels being set below what would have otherwise been emitted to the atmosphere. This proposed default assumption may be more applicable to the average dairy operation, but the same conclusion is not as appropriate for the average swine operation. Swine industry leaders and project operators have expressed that lagoons are cleaned out far less frequently than annually over a 10 to 15-year time frame. Therefore, on the 'Manure-to-Biogas (LOP Inputs)' tab, applicants should be able to enter the project-specific lagoon cleanout frequency for swine livestock populations in the Tier 1 Calculator. Applicants should be able to select from lagoon cleanout frequencies that are less frequent than annual and have default inputs "amortized" according to CARB's current guidance document.

212.12 Anew appreciates CARB's intention to simplify and streamline the project registration process, but it is unclear whether CARB considered that this could come at the expense of swine projects. To accurately reflect actual operating conditions of swine manure projects and minimize pathway registration processing time, we urge CARB to consider allowing applicants to enter actual cleanout frequencies by project in the Tier 1 Calculator.

5. EV Considerations

212.13 Anew is supportive of the additions and latest modifications CARB has made to the Fast Charging Infrastructure ("FCI") credit opportunities for light, medium, and heavy duty charging, including

the provisions allowing a designee to apply for and generate credits, as well as the ability to allocate base credits to the vehicle manufacturers. Anew opposes the requirement that multi-family residential charging must be in non-designated spaces to qualify as non-residential charging. Anew disagrees with the shift of default credit generator away from the forklift owner. Anew appreciates the clarification that EV verifications will require visits to the central records location with discretionary visits to EV charging facilities, but continues to be concerned regarding uncertain facility verification requirements given the large costs multiple verifications would impose on credit generators with large numbers of smaller sites or on customers with secure or limited-access operations where site visits by a third-party could be impactful to operations or security.

We thank CARB for its important work in implementing the LCFS program. Should you have any questions about anything we have stated here or require further clarification, please contact Andrew Brosnan at abrosnan@anewclimate.com.

Sincerely,

Anew Climate, LLC



October 16th, 2024

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

Re: Comments on Proposed Changes to the Low Carbon Fuel Standard (LCFS)

Dear Chair Randolph,

We the undersigned are writing to voice our concern regarding recent changes made to the LCFS's language that would severely hinder the achievement of the LCFS's goals, and significantly disrupt forest management practices. As acknowledged by CARB, proper forestry management is crucial to reducing emissions, as the buildup of dead wood waste increases the likelihood of wildfires, which release disastrous levels of CO2 and other particulate emissions into the atmosphere (<u>CARB</u>, 2022). Over the last decade, over 12 million acres have burnt in California, and an estimated 9 million metric tons of carbon dioxide was released into the atmosphere in 2022 alone. To prevent this, appropriate forest management must be encouraged.

^{213.1} However, **Section 95488.8(g)**, which describes "**Specified Source Feedstocks**," changes the requirements for forest biomass waste in **subsection A3** to a definition too restrictive to generate the necessary support for biofuels investment that will incentivise the reduction of hazardous forest fuels.

As such, we strongly advocate for all wood biomass feedstocks, whether from forest thinning and biomass residuals, ecosystem restoration work or salvage harvest, no matter the ownership category, to not be restricted beyond current federal and California state laws, and should therefore be acceptable for use under the LCFS. To achieve this, we propose specific amended language that would instead state that:

"Forest biomass waste from non-**merchantable trees** industrial forestland removed for the purpose of wildfire fuel reduction, to reduce the risk to public safety or infrastructure, to create defensible space, or for forest restoration **or salvage operations, or slash and non-merchantable timber from forest harvest operations**; and from a treatment in which no- clear cutting occurred and that was performed in compliance with all local, State, and federal rules and permits."

^{213.2} While we understand that other states may not have as stringent forest practice protection laws and regulations as CEQA, NEPA legislation already prevents the abuse of federal forestlands, so a blanket restriction aimed at other states should be outside CARB's purview. Further, forest practices across the US are increasingly concerned with wildfire hazard reduction and biomass removal, as it is the quintessential factor to mitigate the risk of catastrophic wildfires, which a recent <u>US Senate Report</u> on wildfire estimated to cost between \$394 and \$893 billion per year¹. States are likely to implement their own legislation to reduce the frequency of these wildfires, making CARB compliance a further restriction on managing forests across states. With overgrown

¹ US Senate Joint Economic Committee – Chair, The Hon. John Heinrich (D-NM) Yosemiteclean.com



forests continuing to stretch across Federal USFS, industrial and non-industrial forest lands, limiting where forest management can take place is clearly counterproductive.

213.3 **Section 95488.9(g)**, is a further concern. While initially only applying to crop-based biomass, these restrictions have been proposed to extended to cover all biomass. This is unworkable for companies that utilize waste products from both agricultural and forest sources, because the waste is a byproduct and the fuels producer has no control over the crop growing practices. For example, if using almond shells as a feedstock, fuel producers have no control over how almond farmers use pesticides or erosion control methods while growing the crop. Applying the same standards to agricultural or forest residues as to purpose grown crops will prevent the use of waste biomass that will otherwise decompose or burn, releasing carbon into the atmosphere. As such, we propose that this section focus solely on purpose grown crops, reading:

(g) Sustainability Requirements for Biomass Purpose Grown Crops.

(A) Biomass Purpose Grown Crops used in fuel pathways must only be sourced on land that was cleared or cultivated prior to January 1, 2008 and actively managed or fallow, and non-forested since January 1, 2008. Biomass Purpose Grown Crops may not be sourced from land that is covered under international or national law or by the relevant competent authority for nature protection purposes.

(B) Biomass Purpose Grown Crops must be produced according to best environmental management practices that reduce GHG emissions or increase GHG sequestration, including but not limited to:

We appreciate CARB's continued work, and hope that these amendments will help achieve CARB's stated goals.

Kind regards,

Thomas Asbley

Thomas Hobby - MBA, MA, MSc. P. Ag

Chief Executive Officer

Assemblyman James Gallagher Assembly Republican Leader (AD-03)

Comment Log Display

Here is the comment you selected to display.

Comment 214 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Jerry
Last Name	Schmitz
Email Address	Non-web submitted comment
Affiliation	
Subject	Proposed Low Carbon Fuel Standard Amendments Nov 8 hearing
Comment	Comment received during 2nd 15-day comment period. Submitted by Clerk of the Board on Commenter's behalf.
Attachment	
Original File Name	SD Soybean Association LCFS Comments 10-15-24.pdf

Date and Time Comment Was Submitted 2024-10-18 12:02:12

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Board Comments Home



October 16, 2024

Chair Liane Randolph & Members of the Board California Air Resources Board 1001 | Street Sacramento, CA 95814

Via electronic submission

Re: Second 15-Day Changes to the Proposed Regulation Order

Dear Chair Randolph and Members of the California Air Resources Board:

The South Dakota Soybean Association (SDSA) appreciates the opportunity to comment on the proposed modifications (Second 15-Day Changes) to the Low Carbon Fuel Standard (LCFS) program. ASA has welcomed engagement with the California Air Resources Board (CARB) and staff throughout this multi-year process to update the LCFS program.

South Dakota farm families are very proud of the sustainability advances made not only during the production of soybeans but also the lasting benefits to the soil, ecosystems and successive crops provided by the soybean plants and roots.

214.1 CARB's Second 15-Day Changes to revise the LCFS did not address our major concerns with provisions included in the August 15-day notice, nor did it provide additional clarification or detail related to sustainability reporting requirements for agricultural feedstocks. We do appreciate the additional flexibility related to virgin vegetable oil feedstock limitations, by extending the compliance deadline to January 1, 2028, for all approved pathways at the date of adoption. However, additional feedstock limitations included in the Second 15-Day Changes document could further limit soybean oil market share in California when compared to the August proposal.

In addition to the new proposals in the Second 15-Day Changes package South Dakota Soybean
 Association remains deeply concerned with the drastic pivot CARB has made in the past few months related to agricultural feedstocks used for biofuels. We continue to encourage that updates to the LCFS program are based on science, as required by AB-32.

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Amended Feedstock Cap Considerations

	SDSA has significant concerns with the virgin vegetable oil feedstock cap that was included in the
214.6	initial 15-Day Changes posted in August, especially after CARB itself noted that a cap will increase
	the utilization of petroleum diesel. The current proposal limits, or caps, the amount of soybean
	oil that is allowed to generate credits in the program at an arbitrary 20%. Now, CARB is
	expanding on this cap in its Second 15-Day Changes with the inclusion of sunflower oil. Adding
	additional feedstocks to the 20% aggregate cap will further limit market access for soybean oil
	and additional gallons of low-carbon fuels.

Based on CARB's own analysis, a cap on credit generation for vegetable oil feedstocks will lead to an increase in fossil diesel use compared to the status quo. While SDSA agrees that all feedstocks entering the California LCFS market should maintain fidelity to the assumptions underlying their life-cycle assessment (LCA), domestic agricultural feedstocks are facing a redundant, triple penalty through an outdated indirect land use change (ILUC) score, stringent sustainability reporting requirements, and a proposed arbitrary cap on credit generation while all other feedstocks, including imports, do not face the same restrictions.

The proposed cap increases soy's carbon intensity (CI) score for amounts over the cap from the established pathway, which is based on science, to the benchmark CI, which is not based on an LCA for soy. This is effectively increasing soy's ILUC score by upwards of 50% for many pathways without a scientific basis. In fact, CARB has refused to use new data related to ILUC while at the same time effectively increasing it by an arbitrary amount.

214.9 The increase in ILUC for ag feedstocks above the 20% threshold will effectively shut them out of the LCFS. Biomass-based diesel provides GHG and emissions benefits that are unpriced by the market. As a result, they cost more to produce than they can be sold for and rely on policy to account for these benefits. Without the credit generation, soy will not be able to compete against waste feedstock imports, thereby capping use in the LCFS.

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 North American agricultural feedstocks for biofuel production are already held to a high standard for participation in the Renewable Fuel Standard (RFS) and the Canadian Clean Fuels Regulations. Rather than adding additional sustainable North American feedstocks to its arbitrary proposed cap, CARB should consider updating carbon intensity analysis and oversight of imported feedstocks, which are not held to the same level of accountability.

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While SDSA is steadfast in its opposition to the virgin vegetable oil feedstock cap and the rationale used to reach this conclusion, the Second 15-Day Changes added some additional
 214.12 flexibility to come into compliance with the arbitrary cap. We appreciate CARB's acknowledgement that biofuel production facilities cannot shift production overnight, and thank CARB for updating the grandfathering clause to provide a 2028 compliance date for all approved pathways in the LCFS program.

Carbon Intensity Scoring and Auto Acceleration Mechanism

SDSA remains concerned that without a comprehensive update to the Global Trade Analysis Project model for biofuels (GTAP-BIO) that CARB utilizes, soy-based feedstocks will be phased out of the LCFS even without the additional limitations being proposed in the Second 15-Day Changes. Current data indicates a much lower CI score for soybeans, as growers continue to improve soil practices, limit water use, lower on-farm emissions and more. On the one hand, CARB is recommending stringent sustainability guardrails for U.S. soy, but on the other hand is still on track to likely phase-out soy-based biofuels from credit generation by approximately 2035 or sooner.

As CARB looks to develop a more aggressive auto acceleration mechanism to reach CI reduction benchmarks sooner, using outdated methodologies will only limit the output of actual improvement over time in terms of emissions reductions. As CARB updates all other major lifecycle emissions models through this rulemaking, we once again urge action to update the GTAP-BIO model so that the most current, science-based data may be used to determine carbon intensity reductions.

In terms of updating the timeline for analysis of data to trigger the auto acceleration mechanism, SDSA appreciates that CARB is seeking to provide additional notice to the market before a trigger 214.14 is implemented through the ability to analyze data quarter over quarter rather than just annually. This will allow the industry more time to plan and make business decisions ahead of new benchmarks triggering.

Sustainability Guardrails and Traceability Concerns

214.15

214.13

SDSA remains very concerned about the sustainability guardrails. The sustainability guardrails are more onerous than the specified source requirements used for waste feedstock imports. Palm oil in Southeast Asia has had forced labor concerns¹, but CARB does not require used cooking oil



¹ https://apnews.com/article/virus-outbreak-only-on-ap-indonesia-financial-markets-malaysia-7b634596270cc6aa7578a062a30423bb



214.15 cont.	derived from palm to track social or economic sustainability. Concerningly, petroleum also does
	not have to track these criteria. CARB's proposal makes it administratively easier to use non-
	sustainable petroleum ² in the state than biofuels that have lower CI scores and are produced
214.16	from sustainable feedstocks grown in the United States. Land use change is already captured in
	the ILUC score, which makes it unclear what purpose the guardrails serve.

The Second 15-Day Changes offered a bit more detail about how CARB plans to implement its reporting and requirements in terms of traceability, but we continue to have serious concerns about how this proposal will work in practice. By way of background, soybean products pass through many hands before final use. A soybean is produced, potentially transported to a grain elevator, then must reach a soybean processor to be separated into soybean oil and soybean meal (crushed). The meal and oil can then be delivered to end users. Because of this, ensuring the identity preservation of a soybean is not easily accomplished. Soybeans are a bulk commodity, and infrastructure in the U.S. was not developed to segregate subunits of the crop. This bulk handling system based on comingling is one of the inherent advantages the United States has as it reduces transportation costs, and subsequently on-ground emissions.

CARB's proposal states that farmers will have to declare the geographical shapefiles or coordinates of farm boundaries starting in 2026. This raises many issues, including the definition of a farm and how grain must be traced and reported if harvested from several fields but comingled at storage. While the deforestation requirements do not start until 2028, the questions posed above are relevant for the attestations starting in 2026. At that point, farmers will have to declare the boundaries of their farm. CARB settling on one definition for 2026 and another for 2028 would create much confusion. Educational efforts will be needed ahead of 2026. Once farmers understand the program, it will be very difficult to change fundamental definitions.

While 2026 may seem like plenty of time, it is much less for farmers in practice. Soybeans available starting at the beginning of 2026 are from the crop harvested in the fall of 2025 and planted in the spring of 2025. Farmers are purchasing inputs for that crop currently. If delivery points for the next soybean crop require data disclosure, producers need to know that now as they plan out their upcoming crops and lock in investments. So, if new LCFS regulations are not finalized until January 2025 and planting begins in March 2025, it leaves virtually no planning time for a farmer to update practices to adhere to these new attestation requirements.

214.19 If CARB insists on agricultural feedstock traceability, then it should reward sustainable practices beyond what is already assumed in the LCA.



² https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2022.858512/full



214.19 cont.

9 For instance, some soybeans are double-cropped meaning they are grown as a secondary crop following a primary crop within a growing season. They are not displacing other crops or land uses. Double-crop soybeans should be eligible to have the ILUC component of the CI score removed, or at least shared with the other crop in the rotation.

Entities Eligible to Apply for Fuel Pathways

214.20 SDSA is concerned about CARB's proposal to give the Executive Officer the discretion to stop accepting new pathways for biomass-based diesel starting in 2031. We do not understand how this benefits the LCFS. Under AB-32, CARB must under statute minimize costs and maximize GHG reductions. It is unclear how this is served by rejecting new pathways. In fact, the LCFS is best served by allowing the most available pathways. If these pathways cannot achieve cost-effective GHG savings, they will not be utilized by the market in the LCFS. In essence, an increase in pathways can only serve to improve GHG benefits in California. Singling out a single fuel for prejudicial treatment is baffling given the goals of the LCFS and the authority that establishes it.

Recommendations to CARB

As CARB finalizes its update to the LCFS, SDSA aligns itself with the American Soybean 214.21 Association (ASA) recommendations that will likely prevent an increase in fossil diesel use, improve carbon intensity calculations, and improve market access for sustainable agricultural feedstock providers.

First, CARB should not apply the vegetable oil feedstock cap proposal to North American
 feedstocks. As noted above, these feedstocks are already subject to guardrails to ensure
 production on land that has not been converted since 2008. The RFS was designed specifically to prevent land conversion for biofuel production, and U.S. Department of Agriculture (USDA) data shows a decrease in farmland over the same period.

214.23 Second, CARB should convene an expert working group to consider issues related to the sustainability provisions and indirect land use change. CARB has utilized working groups in the past to analyze complex issues related to the LCFS and this is no different. Through meetings with CARB staff and board members, decisions are being made using competing schools of thought. Gathering experts to coalesce around an agreed upon science-based approach moving forward would ensure that CARB is utilizing the best information available. We recommend that this expert working group convenes in 2025 and provide recommendations by October 2026.





214.24

Lastly, CARB must undertake a comprehensive update of the GTAP-BIO model for soybean oil used in biofuel production. Without using the most up-to-date and accurate data, CARB is doing a disservice to the feedstock producers and California's citizens by calculating carbon intensity scores not rooted in current facts. Through CARB's own analysis, we know that basing decisions on old data will lead to more—not less—emissions in the California transportation sector.

Conclusion

- 214.25 SDSA is encouraged by the continued success of programs that support the development of cleaner, low-carbon fuels. However, it is critical that CARB finalizes updates in a way that does not arbitrarily exclude agricultural feedstocks through policies that are not science-based and run afoul of CARB's mandate, including capping vegetable oil feedstocks and applying onerous sustainability guardrails that add cost without rewarding farming practices that lower CI.
- 214.27
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 214.29
 CARB's Second 15-Day Changes did not address any of the fundamental issues raised by soybean farmers in the first 15-Day Changes and failed to acknowledge the potential unintentional consequences of a feedstock outlined by its own employees only a few months before. CARB is required under the law to achieve the maximum technically feasible and cost-effective reductions in GHGs. The two most recent 15-Day Changes show a lack of willingness to achieve the statutory obligations set forth in AB-32.

SDSA is eager to continue working with CARB to support the role of agriculture in diversifying the fuel supply while reducing GHGs and increasing clean air 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 the implementation of policies that expand the use of soy-based biofuels and market opportunities for soybean farmers.

Sincerely,

Jerry Schmitz

Executive Director South Dakota Soybean Association





Helping dairies fuel a renewable future

2134 E. Mineral King Ave Visalia, CA 93292 559-667-9560

October 15, 2024

Ms. Rajinder Sahota Deputy Executive Officer - Climate Change & Research California Air Resources Board 1001 | Street Sacramento, California 95814

Re: California Bioenergy's Comments on the Second 15-Day Notice of Public Availability of Modified Text for the Low Carbon Fuel Standard Program Released October 1, 2024

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) the Second 15-Day Notice of Public Availability of Modified Text for the Low Carbon Fuel Standard Program Released October 1, 2024. California Bioenergy LLC (CalBio) is a leading developer of dairy digester projects. We are committed to producing clean, carbon-negative electricity and fuels, improving air quality, investing directly in the state by creating high-tech jobs in the renewable fuels sector, and helping CARB achieve its ambitious climate goals.

215.1 CARB's LCFS program has been essential in allowing CalBio's 50+ operating digesters to be built, which has led to significant progress towards meeting the goals of SB1383. CalBio writes these comments to express our concern that CARB did not go further to strengthen the ambition of the program. In particular, the near-term carbon intensity (CI) stepdown has not been implemented in accordance with the recommendations from a study by ICF¹, which outlined more aggressive reductions are feasible and necessary. By not aligning with the ICF findings, CARB risks missing an important opportunity to drive impactful emissions reductions. Moreover, it is disappointing that targets beyond a 30% reduction by 2030 were not proposed. In previous comment letters, CalBio recommended that maintaining the slope established in the proposal would result in a CI reduction target of ~34% by 2030. Doing so would create a path for greater emission reductions by shrinking the credit bank and creating greater investment in renewable fuels.

215.3 Additionally, CalBio recognizes the modifications made to the regulatory text around avoided methane crediting periods which are important in helping sustain projects and allow them to continue providing benefits to the state. However, the modification to reduce the total number of crediting periods from three to two 10-year periods for projects which are not certified before the effective date of the regulation remains problematic. This clause potentially undermines many promising dairy digester projects that have already begun construction but may not have an opportunity to be certified in time. Investment was made in these projects under the prior rules of the program and deserve equal support

¹ https://www.arb.ca.gov/lists/com-attach/7586-lcfs2024-VDVTO1Q0UG8DfwB5.pdf


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2134 E. Mineral King Ave Visalia, CA 93292 559-667-9560

- 215.3 Cont. and incentives, as they are critical to advancing California's clean energy transition and contribute significantly to the state's long-term climate. The regulation should have been written to more broadly include projects that have commenced construction, ensuring that they are not unfairly excluded from the program.
- 215.4 CalBio appreciates CARB's recognition of innovative non-combustion electric generation technologies, such as fuel cells, within the "book & claim" framework of the LCFS program. Moreover, the inclusion of temporary pathways for dairy biogas-to-electricity is crucial in ensuring that these advanced technologies can contribute meaningfully to emissions reductions. This support for innovative non-combustion electric generation technologies is consistent with Public Resources Code <u>AB 1921</u> which was moved through the legislature and recently signed by the Governor. Additionally, we understand the LCFS amendments regarding fuel cells are well-aligned with recent federal definition as stated in the Proposed Rule by the Internal Revenue Service on 11/23/2023, which states:

Section 48(c)(1)(C) defines the term "fuel cell power plant" as an integrated system comprised of a fuel cell stack assembly, or linear generator assembly, and associated balance of plant components that converts a fuel into electricity using electrochemical or electromechanical means.

Thank you for the opportunity to provide these comments. We believe the climate emergency demands CARB strengthen the program to support achievement of California's legislatively-mandated greenhouse gas reduction targets. We look forward to further dialogue on these topics.

Sincerely,

Andrew Craig Vice President, Greenhouse Gas Programs California Bioenergy LLC





Clerk of the Board California Air Resources Board 1001 I Street Sacramento, CA 95814

Submitted electronically via: https://ww2.arb.ca.gov/lispub/comm/bclist.php

Comments: Proposed Amendments to the Low Carbon Fuel Standard (LCFS) Program

On behalf of the California Trucking Association, California Transit Association, and Pacific Merchant Shipping Association we appreciate the opportunity to provide comment regarding the proposed amendments to the Low Carbon Fuel Standard (LCFS) Program that would expand the applicability of third-party validation to most electricity transactions. Our organizations represent many of the leading fleets adopting electric vehicles and equipment in California and are participants in the LCFS program. Some of these organizations have already submitted comments to CARB under the prior 45-day and 15-day amendments on these issues. The comments submitted here represent the common concerns of a broad range of LCFS program participants that are leading electrification in their various categories and augment, not replace, the previously submitted comments by these organizations.

We welcome initiatives that promote the adoption of zero-emission technologies, while also maintaining the efficiency and sustainability of the program. Our comments aim to highlight areas where these requirements pose significant challenges and offer alternative approaches.

Unnecessary and Costly Verification for Electricity Transactions

216.1

We respectfully and strongly oppose the introduction of third-party verification for electricpowered equipment such as on-road electric vehicles and off-road electric equipment, including cargo handling equipment (eCHE), electric transportation refrigeration units (eTRU), and electric ocean-going vessels (eOGV), and fixed guideway electricity fueling in the manner proposed in the current 15-day amendments.

Specifically, the modifications to §95500 c(1)E "Verification of Quarterly Fuel Transactions Reports" adding the following electricity-based transaction types:

- EV Charging except 95491(d)(3)(A)
- Fixed Guideway Electricity Fueling
- eTRU Fueling

- eCHE Fueling
- eOGV Fueling
- Forklift Electricity Fueling





First, we note that the proposed changes exclude the single largest source of EV-related credit generation, non-metered residential EV charging. This category represents approximately half of all EV credit generation. By contrast, credit generation from eTRU, eCHE, eOGV, and HD on-road EVs combined represent only about 8 percent of all EV credit generation. While forklifts represent 25 percent of EV credit generation, CARB's proposed amendments will substantially reduce credit generation from forklifts and increase the stringency associated with measurement and reporting for this category.

In prior comments to the 15-day amendments, some commenters noted estimated verification costs at \$100,000 to \$150,000 per year per site subject to inspection and reporting. Other undersigned companies have estimated desktop-only verifications at \$40,000-\$50,000 (excluding site visits) based on costs for verification services under other carbon disclosure programs. Estimates from existing Verifiers in the LCFS program indicated verification costs at \$10,000 per site where site visits are required. For organizations with multiple charging locations, costs of \$50,000 to \$100,000 per year or more are expected. This broad range of cost estimates is indicative of the uncertainty and lack of clarity for Verifiers regarding the requirements of electricity and hydrogen transactions being introduced under \$95500 c(1)E.

For many fleets, these costs would exceed the total annual value of credits generated through their participation in the program. While we note that CARB proposes a "Less Intensive Verification" option for fleets reporting only electricity transactions, these fleets are still required to complete the initial verification and would likely be forced to exit the LCFS program in the first year that third-party verification is required due to the costs of the first full verification effort. Further, the allowance for "Less Intensive Verification" does not apply if a fleet experiences more than a 25 percent variation in the annual energy reported. Hence, even modest variations (including decreases rather than increases) in energy reported would be subject to the full annual verification costs, rendering the Less Intensive Verification option ineffective.

For example, consider a fleet that reaches the 6,000 credit per year threshold that makes them ineligible for deferred reporting. In this case, the fleet would be subject to a full verification of the quarterly reports in the first year. At current credit values (~\$70/MT) the gross annual credit revenue would be \$420,000. A \$50,000 verification cost would represent an administrative cost of nearly 12 percent of gross revenue. When combined with other administrative costs, a fleet participant could be expected to spend between 20 and 30 percent of gross LCFS revenues solely on administrative costs rather than





additional ZEV deployments and infrastructure. If, in the following year, the fleet had an increase or decrease in credit generation of 1,500 credits, the fleet would then be subject to another year of full verification costs. This level of variation is to be expected based on normal business volatility as well as additional EV adoption, making it very likely that Less Intensive Verification will rarely be available to fleets and full verification costs would not be spread out over multiple reporting years.

216.3 Further, we note that the regulation allows for Deferred Verification of quarterly transaction reports if the number of credits generated in the prior year is less than 6,000 credits.¹ However, this means that a fleet that generates 6,000 credits in one year, and then generates less than 6,000 credits in the subsequent year would not be eligible for Deferred Verification. For example, a fleet than reports 6,000 credits would be ineligible for deferred reporting and would be subject to full verification requirements. At current credit prices, the annual gross credit revenue would be \$315,000 and \$50,000 in verification costs would represent 16 percent of annual revenues. Hence, Deferred Verification does not act as protection against overly burdensome administrative costs for fleets experiencing decreases in throughput due to normal business volatility.

Consequently, it seems unreasonable to apply such substantial additional verification burdens and costs to what represents a small fraction of total EV-based credit generation, resulting in significant reductions incentives to electrification particularly for early deployments by leading fleets and for smaller fleets.

Obligations to Parties under Deferred Verification are Unclear

216.4

It is unclear what a fleet's obligations would be under the proposed modifications under §95500 c(1)E when opting out of the program. If a fleet takes advantage of Deferred Verification and then opts out of the program for any reason, they will be required to complete all annual reporting obligations per the "Opting Out Procedure" under 95483.1. The proposed modifications do not make it clear if the fleet would be required to complete a full annual verification prior to leaving the program. This creates significant cost risks to a fleet that does not achieve sufficient credit revenue generation prior to the third year of participation in the program.

¹ For clarity, we note that the proposed modification to increase the eligibility limit for Deferred Verification from 6,000 credits per year to 10,000 credits per year only applies to Pathway Verifications, not Quarterly Transaction Verifications.





For example, consider a transit or school bus fleet that generates 500 credits per year. The fleet could take advantage of deferred verification for two years and would then be subject to full annual reporting in the third year. At current credit prices, the fleet would receive \$105,000 in gross credit revenue over the three years. If the fleet elected to leave the LCFS program because credit prices and/or throughput did not increase sufficiently to make continued participating economically viable, it is unclear if the fleet would still be required to complete a full annual verification to resolve their "deferred" verification obligations. For fleets that already struggle with generating sufficient revenue to cover the administrative costs of LCFS participation, the uncertainty around opt-out obligations would likely discourage participation as the value of "deferred verification" is unclear.

Data Integrity and Reporting Already Sufficient

In both on-road and off-road applications, data is collected predominantly through direct reporting from charging equipment, vehicle telematics, utility meters, or customerinstalled utility grade meters. These data are already subject to audit by the California Air Resources Board (CARB) upon request. The proposed third-party verification would increase operational costs for participants without clear evidence of its value. To our knowledge, systemic or significant over-generation of credits has not been seen by CARB in the LCFS program.

Impact on Program Participation

216.6 The significant costs associated with third-party verification could discourage participation in the LCFS program, undermining its success. For example, in the context of both on-road and off-road vehicle applications, third-party verification could lead to increased expenses for electric fleet operators, further discouraging the broader adoption of zero-emission vehicles (ZEVs). These funds would be better utilized in expanding infrastructure and acquiring ZEVs, directly contributing to California's emissions reduction goals.

Alternative to Quarterly Verifications

We propose an alternative to the quarterly verification process for electricity transactions that meet certain criteria. We believe that historic performance and the nature of these types of EV transactions obviate the need for third-party verification at this time.





216.7 Specifically, EV transactions meeting the following requirements should be excluded from third-party verification:

- 1. The electricity transactions are reported only under Lookup Table pathways and do not contain site-specific carbon intensity assumptions.
- 2. Data is gathered from utility meters, charging logs, customer-installed meters meeting a minimum accuracy threshold of 2 percent, or telematics installed on the equipment (where allowed).
- 3. Going forward, all new FSE registrations are supported by independent documentation that such FSE have been installed and energized (e.g. signed building permits, utility Permission to Operate documents, manufacturer or installer statements that telematics have been installed, etc).
- Further, we believe that CARB could implement a number of strategies to augment their existing audit processes and provide further confidence in reported data without requiring third party verification for all parties reporting the listed transactions under \$95500 c(1)E.
 - 1. Increased use of automated tools within CARB for fraud detection, identifying transactions for further review with participants.
 - 2. Tiered review/escalating stringency of review based on targeted reviews/audits of transactions.
 - 3. Alignment/acceptance of 3rd party verification statements developed under other regulatorily required carbon disclosures.

We believe that these provisions allow for increased confidence that FSE are real and operational, and that data are being collected from appropriate sources. These provisions would allow fleets to participate in the LCFS program without increasing the existing barriers to participation, while enhancing the confidence in the validity of the credits issued in the program.

216.9 As the addition of third-party verification for electricity transactions were not included in any significant workshop activities or discussions in the current rulemaking process, we respectfully request that CARB remove the proposed changes from the final rule. Instead, we request that CARB engage in workshops with stakeholders in 2025 to develop more cost-effective processes that can ensure program integrity while preserving as much revenue as possible for use in furthering the deployment of zero emission vehicles and infrastructure.

216.8





Barring removal of the proposed modifications, we request that CARB, at a minimum:

- 216.10
- Apply the increased 10,000 credit limit for Deferred Verification of Annual Pathways in §95500 b(2)B to the credit limit for Deferred Verification of Quarterly Transactions in §95500 c(2)B.
- 216.11
 2. Extend the initial year for verification under §95500 c(1)D and E from 2027 to 2028 to allow for sufficient time to complete the workshop and subsequent rulemaking process to implement the outcomes of the workshops.

Conclusion

We appreciate CARB's efforts to foster the expansion of zero-emission technologies, but we strongly urge reconsideration of the third-party verification requirements for both offroad and on-road electric equipment applications. By adopting a more balanced and flexible approach to verification, CARB can continue to support clean energy initiatives without deterring participants from the LCFS program.

Thank you for considering our comments. We welcome the opportunity for further dialogue and collaboration on these critical issues.

Sincerely,

Chris Shimoda Senior Vice President Government Affairs California Trucking Association cshimoda@caltrux.org

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Michael Pimentel Executive Director California Transit Association michael@caltransit.org

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Jacqueline Moore Vice President Pacific Merchant Shipping Association jmmore@pmsaship.com

October 16, 2024

Clerks' Office, California Air Resources Board 1001 I Street Sacramento, California 95814 Submitted electronically to <u>https://ww2.arb.ca.gov/applications/public-comments</u>

RE: Low Carbon Fuel Standard Amendments (2nd 15-Day Changes)

Dear California Air Resources Board Members and Staff,

Thank you for the opportunity to provide feedback on the 2nd Low Carbon Fuel Standard (LCFS) 15day Changes. We value the leadership of the California Air Resources Board (CARB) to support and advance the transition to zero emission freight. The undersigned companies (Forum Mobility, EV Realty, Gage Zero, Terawatt Infrastructure, Prologis, Voltera Power, Zeem Solutions) represent providers of charging infrastructure for heavy-duty trucks, including shared depots that serve multiple fleets at a single location.

California's Low Carbon Fuel Standard is a critical tool for advancing zero-emission freight. The LCFS program supports transportation electrification by facilitating infrastructure deployment, lowering fueling costs, and incentivizing the purchase of zero-emission vehicles. The proposed amendments significantly enhance these efforts. Notably, the proposed heavy-duty fast charging infrastructure (HD-FCI) program has the potential to be one of the most important programs in helping to deploy the charging infrastructure necessary for California to meet its zero emission transportation goals set by Governor Newsom's Executive Order N-79-20, along with recent regulations like the Advanced Clean Trucks (ACT) and Advanced Clean Fleets (ACF) rules. As we mentioned in previous comments, the HD-FCI provision addresses utilization risks in the early market phases, helping solve the "chicken or egg" dilemma that currently hampers infrastructure deployment.

The proposed HD-FCI program will drive investment in charging infrastructure

We greatly appreciate the collaboration with CARB staff and Board Members during the LCFS amendment process. We've provided extensive feedback throughout this process and commend staff for making key adjustments to help the HD-FCI program reach its full potential. In the latest round of amendments, we appreciate staff's openness to hearing industry concerns around potential limits on reservations at Shared HD-FCI sites, and we believe the latest amendments allow for sites that will meet both fleet and developer needs.

217.2 The latest 15 Day Change notice also includes minor technical amendments throughout the HD-FCI section that remove many of the uncertainties around site eligibility, credit calculation, and program caps. We support and appreciate these updates and clarifications. Remaining uncertainties for the HD-FCI program can be resolved through the Final Statement of Reasons or board resolution. Specifically, we respectfully request a clarification in staff's resolution that in section 95486.4(b)(1) the five-mile distance from any ready or pending FHWA Alternative Fuel Corridor is as measured on an aerial point-to-point radius basis or "as the crow flies" per our meeting on August 23, 2024.

Outstanding issues need not delay implementation

From our perspective as infrastructure providers, there are two general areas that will require continued attention from state policymakers, both as part of the LCFS implementation process over the coming years and in parallel regulatory processes. First, we continue to have concerns about crop-based biofuel crediting and its impact on market balance and credit values, and we encourage continued dialogue with stakeholders around these complicated issues. Second, we note that changes to the "base" credit allocation for residential EV charging may have the unintended effect of reducing much-needed support for equitable electrification through LCFS "holdback" funds, including investment in heavy-duty vehicle and infrastructure deployment. We stress the need for continued policy and funding support for heavy-duty electrification to enable successful implementation of both ACT and ACF.

217.6 Despite these outstanding questions and policy interactions, we support the second 15-day changes and the overall LCFS program. We are at a pivotal moment for a variety of climate and clean air goals that depend in part on the LCFS. Timely adoption and implementation are needed to provide clear market signals for this nascent industry. The issues above should not cause a delay.

The parties represented in this infrastructure coalition are appreciative of the opportunity to submit comments on CARB's 2nd proposed 15-day changes. The LCFS remains a vital tool for advancing our transportation electrification goals and regulations – particularly given current budget shortfalls and electricity rate affordability concerns – and we appreciate the opportunity to work with staff on updates and clarifications to align the program with state priorities. We strongly encourage the board to adopt the proposed modifications and move forward with this important regulation.

Sincerely,

Adam Browning EVP Policy and Communications Forum Mobility abrowning@forummobility.com

Munni Krishna Director, Policy and Incentives Gage Zero <u>munni@gagezero.com</u>

Sam Vercelotti Senior Policy Manager Terawatt Infrastructure samv@terawattinfrastructure.com

Daniel Schweizer Head of Policy and Regulatory Zeem Solutions dschweizer@zeemsolutions.com Jamie Hall Director, Policy EV Realty jamie@evrealtyus.com

Alexis Moch Vice President, Government Affairs Prologis amoch@prologis.com

Tom Ashley VP, Government and Utility Relations Voltera Power LLC (Voltera) tom@volterapower.com



October 16, 2024

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

RE: Electrify America comments on the Second 15-Day Changes to the Low Carbon Fuel Standard (LCFS) Amendments

Dear Ms. Sahota:

Electrify America is grateful for the opportunity to provide feedback on this latest proposed 15-Day Changes to the LCFS regulations. Electrify America is the nation's largest open network of DC fast chargers for electric vehicles (EVs), with over 4,250 fast chargers across more than 950 locations in North America, and over 1,100 chargers across more than 250 locations open to the public in California.

The LCFS plays a vital role in promoting EV charging infrastructure and advancing California's transportation electrification goals. We commend CARB staff for their exhaustive and transparent efforts to amend the program to meet the market demands of today and ensure its future longevity. We have previously advocated for, and continue to believe, that more ambitious targets are appropriate—specifically a minimum 40% reduction in carbon intensity by 2030, in-line with the Scoping Plan and ICF analysis¹—to allow the program to continue working to advance California's transportation electrification priorities. We strongly support the 9% stringency step-down and the development of the auto acceleration mechanism (AAM), which we hope will help return the LCFS market to health and allow it to continue serving as a driver of investment in EVs and other clean fuels in California.

The auto acceleration mechanism will now be more responsive to market conditions

218.4 We appreciate CARB's willingness to re-evaluate the AAM and support the change in this second 15-day change package to move from calendar year reviews of credit and deficit generation to quarterly reviews. This is a small but important change that will make the mechanism more responsive to market conditions and provide greater certainty to support ongoing investment in clean fuels and ZEV infrastructure. Electrify America believes a more responsive AAM will help maximize the potential of this new element of the program and ensure the ongoing health of the LCFS program.

¹ <u>https://www.arb.ca.gov/lists/com-attach/7078-lcfs2024-VDVcNFlyVGsLdFQu.pdf</u>

The verification process now properly reflects the distinct characteristics of EV charging stations

218.5 Electrify America strongly supports the principle behind proposed amendments in the second 15-day package to the EV fuel pathway verification process requirements, but we have some concern that the proposed regulatory language does not accomplish the underlying goal. The requirement for an annual visit still seems to include each "facility," which is defined such that it would include EV charging stations. We recommend that the annual visit language apply to "fuel production facilities" instead, to clarify what we believe to be CARB's intent.

We understand the crucial need for CARB to validate that fuel pathway holders are operating in line with LCFS regulations and providing accurate data. We appreciate that Staff has recognized the unique nature of EV charging and associated data storage practices and has adjusted the site visit to include company headquarters. This verification approach will better accommodate the operational realities of the charging station model while still effectively verifying the fuel dispensed at the charger level and will certainly be more cost-effective for CARB.

- 218.6 We look forward to continuing to work with CARB on implementing this provision moving forward, and request that Resolution language or future guidance provide the following clarifications:
 - Clarify that the annual visitation language only applies to fuel production facilities, and not EV chargers
 - Clarify that "central records location" does not mean the physical location where files are stored (e.g., a data center), but can encompass company headquarters or another facility with access to appropriate data
 - Clarify that for verifying EV charging data, verifiers have discretion to conduct remote "desktop reviews" of files and data, as well as remote staff interviews, rather than needing to physically conduct the review at a company's headquarters or other specified location. As charging records consist of electronic files, there is no equipment or process to physically inspect at the headquarters location as there may be with, e.g., a biofuels facility.

CARB should adopt LCFS amendments at the November 8, 2024, Board meeting

218.7 Electrify America appreciates the opportunity to provide comments on CARB's second 15-day proposal and commends staff for the thorough engagement process during the development of the new LCFS amendments. We believe the proposed changes represent a meaningful step towards cleaning up California's transportation sector and supporting the EV transition. We encourage CARB to adopt the amendments at its November 8, 2024, Board meeting and to quickly finalize the regulatory package to ensure amendments take effect as soon as possible and the step down applies in Q1 2025. Electrify America remains committed to partnering with CARB to advance California's clean transportation and climate priorities, and we look forward to continuing to work with CARB to implement this critical program, including clarifying the items identified in these comments.

Sincerely,

/s/

Rhiannon Davis Director of Government Affairs Electrify America, LLC



October 16, 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: Comments of Montana Renewables, LLC on CARB's Second Notice of Proposed Modifications (15-Day Changes) to Proposed Low Carbon Fuel Standard Amendments

Dear Dr. Cliff,

Montana Renewables, LLC ("MRL" or "the Company") hereby provides comments on the California Air Resources Board's ("CARB") second notice of proposed modifications (15-day changes) to the California Low Carbon Fuel Standard ("LCFS") amendments (hereafter referred to as the "Second 15-Day Changes"). As noted in our prior comments¹, we remain generally supportive of the more stringent carbon intensity ("CI") targets and 9% "stepdown" included in the proposal and encourage CARB to finalize these aspects. We are disappointed, however, that the specific concerns that we (among many others) raised in response to CARB's first notice of 15-day changes have largely gone unanswered in the Second 15-Day Changes. We briefly summarize and re-state these concerns below and ask that CARB continue to consider these matters in deliberations on this rulemaking as well as future amendments to the LCFS program.

Remove or Defer Implementation of Plant Oil Credit Caps: We continue to believe that CARB's 219.2 imposition of "caps" on credit-generation for biomass-based diesel produced from certain plant oil feedstocks (soy, canola and - now - sunflower oil) is arbitrary, capricious and in contravention of the goals of the LCFS program. Such caps have not been sufficiently vetted through a public process with an opportunity to weigh and analyze the operational and commercial impacts on affected stakeholders. Furthermore, these caps are wholly unnecessary in light of declining annual CI standards that will naturally discourage such feedstocks over time, especially when coupled with CARB's proposed sustainability requirements that raise the bar for feedstock eligibility. And while we 219.3appreciate that the Second 15-Day Changes have clarified the three-year deferral available for existing biomass-based diesel pathway holders, we continue to believe that this deferral period is far too short to avoid or even minimize material disruptions to producers' investments and longer-term plans incorporating the use of plant oils. Maintaining a well-rounded feedstock mix is vital for the safe and 219.4 efficient operation of a biomass-based diesel refinery; CARB's decision to retain and expand the proposed 20% credit-eligibility cap risks punishing producers for doing so. For all of these reasons, we urge CARB to withdraw the proposed caps on plant oil-based biomass-based diesel eligibility.

¹ MRL previously provided comments on the proposed Low Carbon Fuel Standard ("LCFS") amendments by letter dated February 20, 2024 (<u>https://www.arb.ca.gov/lists/com-attach/6934-lcfs2024-WjcHbgBvV3ADZFI8.pdf</u>), on the California Air Resources Board's ("CARB") related public workshop by letter dated May 10, 2024 (<u>https://ww2.arb.ca.gov/form/public-comments/submissions/11501</u>), and on CARB's first 15-day notice by letter dated August 27, 2024 (<u>www.arb.ca.gov/lists/com-attach/7571-lcfs2024-Uz5TOloyVnECZQhm.pdf</u>).

Public Comments of Montana Renewables, LLC California LCFS Amendments – 15-Day Changes October 16, 2024

- CARB Should be Sending Stronger Signals in Support of SAF: We are disappointed that the Second 15-Day Changes do not include any revisions or changes intended to encourage Sustainable Aviation Fuel ("SAF") sales in California. We believe that concrete, well-defined measures are needed to incentivize SAF and level the playing field with other renewable fuels. We intend to continue to engage with CARB to emphasize the critical need to support this emerging fuel sector; however, there is still time for CARB to implement at least a modest change that would send an important investment signal. CARB should remove the applicability of the Auto Acceleration Mechanism (AAM) to the table of annual jet fuel CI benchmarks. This would help ensure that LCFS credit generation opportunities for SAF will proceed predictably, without being subject to the dynamics of an LCFS credit bank that is well beyond the ability of the nascent SAF market to influence.
- 219.6
 Credit True Up Opportunities Should Be Finalized and Implemented Immediately: MRL supports CARB's proposed addition of a credit true up opportunity in Section 95488.10(b) of the LCFS regulations. We believe this justifiably rewards producers whose validated/verified CI scores outperform their previously registered CI scores, including temporary pathway CIs. We continue to believe that CARB should allow retroactive credit generation as early as the 2024 annual Fuel Pathway Report (for the data reporting period covering 2023 and 2024), since verification of such report data will completed after the effective date of this rulemaking.
- CARB Should Finalize Sustainability Requirements and Provide Additional Time for Implementation: As an ISCC-certified producer of SAF, MRL is supportive of CARB's inclusion of sustainability requirements in the LCFS program. However, in light of the substantial engagement that will be needed with stakeholders in affected agricultural supply chains – the vast majority of whom are not directly regulated under the LCFS – we urge CARB to proceed at a reasonable pace and provide at least one additional year the proposed phase in periods applicable to existing certified biomass pathways (including soy and canola) under Section 95488.9(g) of the LCFS regulations. CARB should also commit to a stakeholder outreach and education program that would begin in early 2025, to assist regulated fuel producers with communicating new requirements to their feedstock suppliers (and those in the supply chain upstream of them).
 - CARB Should Clarify the Proposed Cut-Off Date for New Biomass-Based Diesel Pathways: We reiterate our prior concerns that the proposed cut-off provisions for new biomass-based diesel pathways (if certain conditions are met) should be clarified to avoid deterring investments in low carbon fuels that CARB still desires to incentivize. Specifically, CARB should confirm that the proposed cut-off (1) does not apply to SAF, even if produced by a biomass-based diesel producer; and (2) does not prevent routine modifications of existing biomass-based diesel pathways (including but not limited to new inputs; CI scoring changes following an operational CI verification; or changes resulting from the adoption of a new version of CA-GREET or an alternative emissions model).

Public Comments of Montana Renewables, LLC California LCFS Amendments – 15-Day Changes October 16, 2024

* * *

Thank you for considering these comments. We look forward to engaging further with CARB staff on this rulemaking and in the future. Please do not hesitate to contact us with any questions.

Regards,

Greg Staiti Compliance Director, MRL



October 16, 2024

The Honorable Liane Randolph, Chair State of California Air Resources Board 1001 | Street Sacramento, CA 95814

Electronic submittal: https://ww2.arb.ca.gov/lispub/comm/bclist.php

RE: Comments to the California Air Resources Board on Proposed Modifications (Second 15-Day Changes) to the proposed Low Carbon Fuel Standard (LCFS) Amendments

The Green Hydrogen Coalition ('GHC') is appreciative of the California Air Resources Board's (CARB) Low Carbon Fuel Standard Amendments (LCFS). The GHC is a California educational 501(c)(3) non-profit organization that was formed in 2019 to recognize the game-changing potential of "green hydrogen" to accelerate multi-sector decarbonization and combat climate change. The GHC's mission is to facilitate policies and practices that advance green hydrogen production and use across all sectors of the economy to accelerate a carbon-free energy future and a just energy transition.

The GHC appreciates CARB's leadership in advancing clean fuels via the LCFS program. This program is widely considered one of the most successful programs in North America in achieving the deployment of lower carbon fuels and applauds CARB staff for their thoughtful and forward-thinking proposed modifications to the LCFS. The GHC respectfully submits the following comments to CARB.

GHC recommends strengthening demand and supply signals for alternative fuels – including allowing incentives for renewable H2 as an input for other transportation (non-road) fuels.

In the consideration of alternative fuels, specifically non-fossil fuels, CARB should focus on developing strong supply and demand signals as it lays out its regulations. This should be a key driver for the design of the LFCS, rather than compartmentalizing fuels into specific usage categories. Namely, under the current proposed rules there is a prioritization on renewable hydrogen used as a finished fuel for road transportation within the LCFS, and not for renewable hydrogen used in the production of other low carbon fuels. Hydrogen can serve as a direct fuel and is an essential renewable energy input for other liquid transportation fuels, including but not limited to renewable ammonia, e-methanol, renewable diesel, or sustainable aviation fuel. These fuels

Green Hydrogen Coalition

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are critically important to deeply decarbonize hard to abate sectors including some of the most hard to decarbonize sectors within the transportation sector such as maritime shipping and aviation. A key barrier to the use of renewable hydrogen for on road applications and for the production of these derivative fuels is its cost compared to status quo fossil fuels. Market signals that will encourage the scaling of renewable hydrogen production will drive down costs for all uses, on road and off road and even hard to abate sectors. The sooner we can scale the production of renewable hydrogen for all transportation end uses, the faster we can achieve our clean energy transition.

In the near term, the available supply of renewable hydrogen will be relatively low compared to the current availability of fossil derived hydrogen. A key problem that CARB and the broader renewable hydrogen economy needs to solve for is instituting the right signals to grow the supply and help ensure that the supply is available to sectors that are being prioritized in other complementary policies (i.e. Advanced Clean Fleets and Advanced Clean Trucks). There are two paths to consider: one in which the LCFS simply prioritizes directing the limited amount of renewable hydrogen to on-road use and a second one that prioritizes scaling the amount of renewable hydrogen produced in California without restricting or directing the final use.

It is worth noting that a ready and available supply of electrons on our grid is enabling the growth in adoption of battery electric vehicles that use substantially more electricity relative to an average household. Except for very large charging operations (at the multi-megawatt scale), it is relatively easy to utilize the grid to power battery electric vehicles throughout California without a need to prioritize electrons for on-road use. Similarly, if California can create the underlying infrastructure that can deliver copious amounts of renewable hydrogen to generate ammonia, e-methanol, renewable diesel, or sustainable aviation fuel, it will help guarantee a much larger supply of the resource (and have a much lower-cost given economies of scale that will be achieved). In other words, if the LCFS were to help catalyze the development of alternative renewable fuels which represents a significant potential near term off take, this would help drive needed scaled demand for renewable hydrogen and facilitate the scaling of renewable hydrogen production, transport and storage facilities, accelerating cost reduction and ultimately creating a virtuous cycle for faster on-road adoption of renewable hydrogen as a direct fuel as well. By not restricting final use of the hydrogen, California can also unlock its vast renewable potential to produce renewable hydrogen at scale and be able to achieve economywide deep decarbonization much faster.

Accordingly, the GHC requests that CARB include additional direction to support the market demand and supply for hydrogen as a part of its Board Resolution adopting LCFS amendments. Specifically, GHC requests the Board Resolution require CARB staff to develop additional demand signals to enable the development of lowest-cost hydrogen for the transportation market, including

Green Hydrogen Coalition



220.2 (incentives to utilize renewable hydrogen as an input to transportation fuels for the maritime and aviation sectors.)

The GHC Supports Making Fossil Gas Ineligible as a Feedstock for Credit Generation as of 2035 instead of 2030

- 220.3 Per the proposed changes, fossil gas used as feedstock for the production of hydrogen is ineligible for LCFS credit generation starting in 2035, a change from 2030. The GHC supports the need to accelerate the growth of the renewable hydrogen industry in California to replace fossil-based hydrogen over time, but there are investments that need to happen today by the incumbent industry as they transition away from fossil to renewable resources. There are many pathways to produce renewable hydrogen, including SMR of biogas and ideally SMR of biogas with carbon sequestration. Today, CCS on any SMR process is still relatively new and will likely be first developed on fossil gas. Allowing a longer runway for fossil gas will help stimulate needed investment by the oil and gas industry to improve and perfect CCS with SMR. This also aligns with two other policies that CARB is prioritizing, namely:
 - CARB is moving away from combustion uses to non-combustion uses. The Advanced Clean Fleets Rule has set 2035 as the deadline for fleets to transition away from combustion and towards ZEV.
 - Within LCFS CARB is also moving to disincentivize combustion of RNG and instead encourage RNG use for producing renewable hydrogen. GHC supports this direction. Biogas that is combusted in heavy duty applications will ideally have a new use -- conversion to renewable hydrogen to be used in those same or similar applications, and ideally with CCUS.

GHC supports Expansion of Book and Claim for Low-CI Power Beyond Electrolytic Pathways to Also Include Biomass and Biogas Pathways to Produce Renewable and Low Carbon Hydrogen.

The application of book and claim for the sourcing of low-CI energy used to run processes in the production of renewable hydrogen should apply to all renewable pathways. We are supportive of this change in the final 15 –day proposed changes. Allowing for the sourcing of low-CI power is essential in achieving ultra low and negative carbon intensities that will accelerate achieving the programs goals. Additionally, this is a good demand signal for the renewable energy space that will need to grow and deploy renewable resources to fulfill the needs in this sector.

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GHC supports the 3-month matching period for low CI electricity and within 3 years construction to meet additionality requirements.

220.5 The Second 15-day proposed changes modify the indirect accounting approach (book-and-claim approach) with respect to low carbon intensity (CI) energy. This change requires a 3-month matching period for the claiming of low-CI electricity and 3 years additionality of the resource within the local balancing authority or consistent with PUC 399.16. Reducing the matching requirement, but maintaining flexibility with a 3-month matching approach, is the right balance to begin addressing some of the seasonal shortcomings in renewable energy generation for the grid while ensuring that the growing renewable hydrogen industry in California can create demand for more renewable power to come online.

GHC supports establishing a bold goal requiring 80% of hydrogen fuel dispensed at fueling stations for all on road vehicles to be renewable by 2030.

220.6 Even though GHC has supported parity for H2 fueled vehicles and battery electric EVs in the past, GHC welcomes greater leadership for more ambitious renewable hydrogen targets generally. Bold renewable targets will stimulate market demand for renewable hydrogen and provide needed certainty for producers. As we have discussed previously in this letter, scale is key to achieving these goals, and setting more ambitious renewable targets will provide a needed market signal to scale production.

GHC supports inclusion of Linear Generators as a non-combustion technology

220.7 GHC recommends inclusion of linear generators, in addition to fuel cells. Like fuel cells, linear generators can provide non-combustion conversion of a variety of renewable fuels and gases – biomethane, biogas, renewable ammonia or hydrogen – to electricity with virtually no emissions. Linear generators using renewable fuels are now RPS eligible pursuant to AB 1921 (Pappan, 2024) and should be included in the LCFS as well.

> GHC specifically recommends that the Air Board add linear generators to the two sections that specifically mention fuel cells or to replace the term "fuel cells" with "non-combustion conversion technologies such as fuel cells or linear generators." This change should be made to the two sections below and anywhere else that lists fuel cells as an eligible technology.

 A. 95488.8(i)(2) - "staff proposes to allow for book-and-claim accounting of biomethane to produce electricity for electric vehicle charging, provided the electricity is generated using a fuel cell, linear generator, or other non-combustion technology."

Green Hydrogen Coalition



220.7 B. 95488.9(b) - "staff proposes to add a new temporary CI for low-CI electricity produced by fuel cell or linear generator from biomethane from dairy and swine manure, based on existing program data."

Thank you for the opportunity to provide comments on this important program for our energy transition. We look forward to getting to work on implementation and progress to meet our shared goal of decarbonizing the transportation sector.

Sincerely,

Aunl

Janice Lin GHC Founder and President





Fariya Ali State Agency Relations (415) 635-7113 fariya.ali@pge.com

October 16, 2024

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Rajinder Sahota, Deputy Executive Officer California Air Resources Board 1001 "I" Street Sacramento, CA 95814

RE: PG&E Comments in Support of Proposed Low Carbon Fuel Standard Modifications

Pacific Gas and Electric Company (PG&E) appreciates this opportunity to comment in support of the California Air Resources Board's (CARB) release of additional modifications to the formal draft of Low Carbon Fuel Standard (LCFS) amendments for a second 15-day public comment period.

PG&E continues to support the LCFS as a critical program in the State's overall climate portfolio and specifically for its crucial role in accelerating the transition of the State's transportation sector. Arguably even more important is the role the LCFS plays as a model program for other states and jurisdictions. In this vein, adopting amendments that revive a robust and resilient LCFS market, primarily through addressing the credit/deficit imbalance that is currently depressing LCFS credit prices, is the most important way the program can continue to inspire similar action beyond California's borders. While the second 15-day changes make incremental improvements upon the prior draft amendments, PG&E acknowledges that not all stakeholder concerns will be addressed, PG&E's included. These concerns notwithstanding, we urge the Board not to let perfect be the enemy of the good; in this case the "good" being the revitalization of a functioning LCFS market along with meaningful and important program enhancements and refinements. Further delay of the approval of these critical LCFS amendments will be devastating for the program, risk significant market uncertainty and disruption, and harm CARB and California's pioneering reputation in this space.

To the extent that technical clarifications can be addressed through the Final Statement of Reasons (FSOR) report and subsequent guidance documents, PG&E will continue to work with staff to streamline our remaining implementation-related issues around electricity, hydrogen and renewable natural gas fuels. PG&E also supports the following changes made in the second 15-day changes related to utility programs:

• Increase of utility holdback equity project administrative caps from 7% to 10%.

- Clarifications around holdback equity spending requirements, including rollover of shortfalls.
 - Clarification that unspent funds allocated to the state-wide Clean Fuel Rewards (CFR)
 program will be returned to electric utilities for use in holdback projects should utility
 base credits be allocated to original equipment manufacturers (OEMs) and the CFR
 program ceases.

PG&E reiterates its overall support of the LCFS program and recommends approval of the final amendment package, including the second 15-day changes. PG&E looks forward to continuing to work closely with staff on clarifications as needed, and appreciates staff's commitment to doing so.

Sincerely,

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/s/ Fariya Ali Interim Director State Agency Relations





October 16, 2024

The Honorable Liane Randolph Chair California Air Resources Board 1001 I Street Sacramento, CA 95864

Re: Second 15-day Changes to the Proposed Low Carbon Fuel Standard Regulation

Our issues are technical and not political – we fully support the need for and continuation of the LCFS, but changes are necessary prior to adoption.

On behalf of the undersigned associations, we are pleased to submit the following comments for consideration as the California Air Resources Board (CARB) deliberates the updates to the Low Carbon Fuel Standard (LCFS) and 2nd 15-day changes to the proposed rule. We appreciate the years that staff have committed to developing the proposed LCFS updates, as well as the time working with stakeholders. The LCFS is one of the primary drivers of private investment in California's climate change programs and remains one of the pivotal policy innovations that influences other states to adopt climate policies. The LCFS is one of three visible market signals in California's suite of climate change policies, making it a target of criticism seeking to erode support for the program. However, simple analysis of the 2022 Scoping Plan illustrates that even at LCFS's highest credit prices, this program is less costly than the average direct regulatory measure. Additionally, the LCFS drives innovation and investment that has substantially reduced emissions in the transportation sector.

Our sector relies on the investment signal sent by the declining carbon intensity standard, which incentivizes hydrogen producers to make significant long-term investments to deliver zero-emission, low carbon fuel to California drivers and fleets who are adopting fuel cell electric vehicles (FCEV). It is imperative that CARB consider the investment climate when deliberating this rulemaking package.

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Unfortunately, the 2nd 15-day changes omit necessary updates to support hydrogen refueling infrastructure (HRI). The 2nd 15-day package falls short of incentivizing investment in this market due to several layers of limitations that have not been adequately addressed, which will severely impact hydrogen deployment in California. Hydrogen production, infrastructure and offtake markets have not received commensurate investment from California to support the requirements and credit limitations that are being imposed in this rule. The LCFS is the only market signal that supports private investment in this sector, and we are concerned that, as drafted, the LCFS rule will discourage investment as the market will naturally look for more secure investment opportunities.

Outstanding Issues

We appreciate the continuation of the HRI pathway for light- and medium-duty vehicles, as well as the creation of a heavy-duty HRI pathway. However, shortening the crediting window from 15 years to 10 years significantly alters the economics of our proposal. This challenge is compounded by the cap on revenue generation for both pathways and the lack of adjustment to the derate for the heavy-duty HRI 222.4

The HRI mechanism is self-regulating and does not require additional constraints. It was designed to support early investments in hydrogen stations while waiting for vehicles to come to market, offering assurance to manufacturers, buyers, and end users of FCEVs that stations will be available (ahead of the cars and trucks) and supported. As vehicle demand grows, more credits become available, fostering investment in additional stations and creating a natural balance within the program. If vehicle adoption is slower than expected, initial stations will still be supported, preventing overbuilding and ensuring the network remains sustainable. Introducing further credit and revenue constraints undermines private investment in (zero-emission refueling) stations, jeopardize their operational viability and will result in a failure to deploy the early market stations the program is designed to support.

The original HRI policy was intended to drive hydrogen station development ahead of vehicle deployment, while providing financial protection in case the rollout of hydrogen vehicles occurred more slowly than anticipated. This policy ensures that stations can minimize capital risk and operating costs regardless of how quickly FCEVs are adopted. Additionally, the policy was designed to be self-regulating and to phase out on its own over time. When vehicle adoption is slower, stations generate more HRI credits to sustain their operations in place of sales revenue. If station capacity growth outpaces vehicle deployment, the availability of HRI credits for new stations decreases, preventing overbuilding. Conversely, when vehicle adoption is faster, stations generate fewer HRI credits as their sales revenue increases, while HRI credits remain available to support the development of new stations to keep up with vehicle growth.

This original HRI policy has delivered several key benefits during periods when LCFS credit values were strong. It has unlocked private investment to build stations in advance of vehicle deployment, lowered hydrogen prices at the pump even in early years of low utilization, drove investment in R&D to improve station performance and reliability, and promoted the installation of higher-capacity stations capable of serving more vehicles with fewer delays.

1.5X Cap - § 95486.3 (a)(4)(H) and § 95486.4 (a)(4)(I)

The 1.5X cap on credit generation limits the effectiveness of the HRI program in achieving its goals of supporting early hydrogen station development. By capping credit generation at 1.5X the station's capacity, the policy unintentionally stifles the very private investment and market expansion that the program is designed to encourage. The goal of the HRI is to bridge the gap between station construction and the arrival of vehicles on the market, ensuring that stations remain financially viable even when vehicle rollout is slower than expected. However, the 1.5X cap hinders this dynamic by placing an artificial ceiling on the amount of support available for station operations, especially during the critical early years.

Eliminating the 1.5X cap would allow the HRI mechanism to function more effectively as a self-regulating tool, in line with its original intent. When vehicle adoption is slow, stations should be able to generate more credits to offset lower sales revenue, ensuring they remain operational and supported while waiting for the market to grow. As vehicle deployment picks up, the reliance on HRI credits would naturally decrease, since stations would begin generating revenue from fuel sales. This organic balance between credit generation and market demand is key to a healthy hydrogen infrastructure, and the 1.5X cap disrupts this balance by prematurely limiting the financial support available to stations.

Conversely, removing the cap would stimulate greater private investment in the hydrogen sector. Investors are more likely to commit to building new stations if they are confident that the credit system will provide adequate returns in the early years of operation. With the 1.5X cap in place, the financial risk remains too high, deterring the very investments that are necessary to scale the hydrogen infrastructure to meet future demand. By lifting the cap, CARB would foster a more favorable environment for private capital, leading to more stations being built ahead of vehicle deployment, which in turn would spur vehicle adoption.

Furthermore, the 1.5X cap may inadvertently lead to inefficiencies in the design and operation of hydrogen stations. To maximize credit generation within the restricted framework, developers may feel pressured to build smaller stations that can reach their credit cap more easily, rather than designing stations with higher capacity that can better serve growing vehicle numbers over time. This short-term approach could result in stations being underbuilt and unable to meet demand once the hydrogen vehicle market accelerates. Removing the cap would encourage the construction of larger, more robust stations that are better equipped to handle long-term demand and serve more vehicles efficiently.

By eliminating the 1.5X cap, the HRI program would become more aligned with its purpose of supporting early-stage infrastructure development and long-term market growth. It would reduce the financial uncertainty surrounding station operations, attract greater investment, and encourage the construction of stations designed for the future, all while allowing the self-regulating nature of the program to maintain balance between station capacity and vehicle rollout.

Recommendation: Eliminate the 1.5X cap for both HRI pathways by striking, in full, § 95486.3 (a)(4)(H) and § 95486.4 (a)(4)(I).

De-Rate of Heavy-Duty Stations - § 95486.4(a)(2)(F)

The current proposal to impose a 50% de-rate on HD HRS within a shortened 10-year crediting window poses significant financial challenges for station developers. This combination drastically alters the economic feasibility of investing in HD hydrogen stations, creating a substantial risk of capital recovery. By reducing the potential credits generated by 42.5% from our initial proposal in 2022, this policy undermines the financial foundation of these costly investments and increases the likelihood that developers will be unable to recover their costs, making these projects far less attractive.

HD HRS investments are exceptionally expensive and securing take-or-pay agreements with commercial fleets to guarantee a return on investment is difficult given the current stage of market development. Without a clearer and more favorable signal from CARB in the form of an adjusted de-rate, developers

may simply refrain from building these essential stations. The result would be a stalled market, perpetuating the "chicken-and-egg" problem this program was originally designed to solve. In essence, without adequate incentives, the necessary infrastructure won't be built, hindering the growth of heavyduty hydrogen vehicle adoption.

222.5 cont.

> While our original proposal suggested a 25% de-rate, we acknowledge that a compromise is necessary. However, the 50% de-rate is simply too restrictive, especially given the shortened crediting period. We propose a 37.5% de-rate as a middle ground, providing a more feasible path forward for developers while still allowing CARB to meet its goals. This adjustment would significantly reduce the financial burden on developers and encourage the construction of more stations. Even with this compromise, station developers will still be taking considerable risks, as the de-rate still results in a loss of potential credits, and a 13% adjustment would be necessary to make developers whole based on our original industry proposal.

The proposed compromise of a 37.5% de-rate strikes a balance between CARB's objectives and the need to incentivize station development. This compromise would allow the crediting of upwards of 80 heavyduty stations, substantially supporting and exceeding what is currently planned through funding programs like the Clean Transportation Fund, the General Fund, and ARCHES. Additionally, if fuel cell vehicle adoption and hydrogen throughput increase over time, more credits will naturally become available, enabling further expansion of the hydrogen refueling network.

Ultimately, this compromise offers a practical solution that meets both the needs of developers and the goals of CARB, ensuring that HD HRS can be built and that the hydrogen market can continue to grow without undue financial burden. Without this adjustment, the risk to developers will be too great, and the market risks stagnation at a critical juncture.

Compared to a <u>15 vear</u> crediting period for the original proposal	2022 Initial Proposal	2024 Proposed Regulation Order #1 (Jan 5th <u>2024</u>):	2024 Proposed Regulation Order #2 (August 2024):	CHC Recommendation 15-day comment period (Sep 24) De-rating factor of 25% and remove cap of 1.5x of CAPEX	CHC Recommendation 15-day comment period (Sep 24) De-rating factor of 37.5% and remove cap of 1.5x of CAPEX	Equivalent De- rating factor to match credit generated based on original proposal
Station Capacity (kg/day)	6000	6000	6000	6000	6000	6000
HRI Eligibility (years)	15	10	10	10	10	10
Benchmark	Current Standard	5% Step Down in 2025	9% Step Down in 2025	9% Step Down in 2025	9% Step Down in 2025	9% Step Down in 2025
De-rating factor	50%	50%	50%	25%	37.5%	13%
Credits	282131	163432	162167	243250	202708	282131
Impact on Credit Reduction from						
2022 Proposal		<u>42.1%</u>	<u>42.5%</u>	<u>16.0%</u>	<u>28.2%</u>	0.0%
Number of HD stations that can be supported by the program*			90	60	80	55

¹ Deficit projection is from <u>ICF's forecast</u>.

Recommendation: Adjust the derate to 37.5%, meeting HRS developers in the middle of the two proposals and providing additional investment certainty while they assume additional risk from the original proposal.

¹ ICF's forecast

Modifications to Section 95482. Fuels Subject to Regulation.

60% is not aligned with 80% and December 31, 2030, is not aligned with January 1, 2030 The proposed modifications continue to hold hydrogen to a higher standard than the electricity grid both in terms of timing and renewable content. Senate Bill 100 (De León, Chapter 312, Statutes 2018) requires that retail electricity sales achieve **60% renewable by December 31, 2030**, and 100% zero-carbon by 2045, with no intermediate targets between those two mandates. The proposed LCFS requires that hydrogen be 20% more renewable than the grid a year earlier, without the substantial financial support that rate basing renewable procurement provides to retailers of electricity. By contrast, there is no fossil ineligibility in SB 100, nor is there any law that prohibits the use of fossil fuel for electricity production even in 2045. In fact, California's laws focus solely on retail sales which further omits approximately 10-15% of the electricity on the grid.

Unfortunately, the HRI constraints advanced in this proposal create a higher standard for hydrogen which will add substantial costs that bias economics against hydrogen; therefore, will slow the uptake of FCEVs. As written, the LCFS will add the cost of Federal Renewable Fuel Standard RIN credits to hydrogen retailed in California because at present there are no RINs for hydrogen fuel. Additionally, the content requirement and dates are not aligned with the grid requirements.

Recommendation: Align the requirements with SB 100 – 60% renewable by December 31, 2030.

Modifications to Section 95486.3. Generating and Calculating Credits for ZEV Fueling Infrastructure Pathways for Light- and Medium-Duty Vehicles.

We appreciate and support the elimination of the derate and the changes to the station capacity. The current HRI pathway works when market prices support investment. As described earlier in this letter, the advantage of the HRI pathway is the natural self-regulation based on current economics. However, with the 1.5X cap proposed the HRI is unlikely to perform as it has in the past. As proposed, HRI will not support capital and operational expenditures to support station economics during the ebbs and flows of market transition away from fossil fuels thus eliminating the risk management that this pathway was intended to solve.

Additionally, planned stations with existing awards should be grandfathered into the existing pathway as the 1.5X cap undermines investment and will further risk those awards. Preferably, the 1.5X cap will be eliminated and therefore eliminate the need for grandfathering.

Recommendation: Eliminate the 1.5X cap for both HRI pathways by striking, in full, § 95486.3 (a)(4)(H) and § 95486.4 (a)(4)(I).

Modifications to Section 95486.4. Generating and Calculating Credits for ZEV Fueling Infrastructure Pathways for Heavy-Duty Vehicles.

We appreciate and support the addition of local funding for eligibility and by extension the location flexibility added for those stations.

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222.8

§ 95486.4 (a)(4)(D)

This subsection incorrectly states "HD-FCI" as opposed to "HD-HRI."

222.9

Recommendation: A fleet-owned shared HD-HRI station cannot be reserved for one HDV fleet for more than 12 hours each day. There is no limit on the length of reservations at shared <mark>HD-FCI <u>HD-HRI</u> sites that</mark> are owned by third parties and designed for multi-fleet access so long as the site is shared and open to multiple fleets.

Modifications to Section 95488.8. Fuel Pathway Application Requirements Applying to All Classifications.

222.10 We appreciate and support the clarification that will allow all hydrogen production to utilize low-Cl electricity for production and processing further deliver on California's goals to deeply decarbonize the economy. With a focus on carbon intensity reductions this change will facilitate the development of decarbonized hydrogen production from a variety of biogenic feedstocks.

Modifications to Section 95488.9. Special Circumstances for Fuel Pathway Applications.

222.11 We appreciate and support the temporary pathway. With consideration to the near-term requirements proposed for hydrogen, it will be critical to have these pathways available.

§ 95481. Definitions and Acronyms

The definition of "Medium-Duty Vehicle" (MDV) is misaligned for vehicle refueling behavior. While there are varying government definitions for MDVs, based on the utilization for this rulemaking it is best to use the Federal Highway Administration Gross Vehicle Weight Rating (GVRW) Category.²

> We strongly encourage CARB to adopt the standard definition of medium-duty vehicles (MDVs) as those in Classes 3-6 (10,001 to 26,000 lbs. GVWR). Currently, many MDVs up to Class 6 utilize light-duty fueling stations as part of their routine operations, while heavy-duty vehicles (HDVs) in Classes 7 and 8 typically use dedicated HDV fueling lanes or truck stops. Aligning this definition and fueling practices with industry norms is essential. Introducing a different classification for MDVs under LCFS risks creating confusion among station developers and MDV fleet operators, potentially delaying station development and leading to stations that aren't suited to all vehicle types.

Recommendation: Increase MDV to mean a vehicle that is rated at 10,001 and 26,000 pounds GVRW. This also requires adjusting the "Light-Duty Vehicle" (LDV) definition to mean a vehicle that is rated at 10,000 pounds or less GVRW.

222.13 Additionally, there is a typo in the definition of "Public LMD-HRI Station" where "EV" is used instead of "FCV."

² https://afdc.energy.gov/data/10380

Recommendation: "Public LMD-HRI Station" means a hydrogen refueling station that can be restricted to
 light- and medium-duty EVS FCVS and that is available to the public for at least 12 continuous hours each day, including the time interval between 9 a.m. and 5 p.m. The station must not be reservable during public hours.

Conclusion

We fully support the need for the LCFS as a tool to drive decarbonization at the pace and scale necessary to achieve California's carbon neutrality goal in 2045. It is imperative, however, that if CARB requires a higher standard for hydrogen, then policy must support these requirements. The continued inclusion of a 1.5X cap on capex for both HRI pathways and the 50% derate will undermine investments necessary to provide hydrogen fuel to a growing market. We are disappointed that our openness with staff and disclosure of data has been ignored. We urge the board to eliminate the 1.5X cap and adjust the HD HRI derate to 37.5% to support the hydrogen sector in supporting CARB's vehicle deployment targets in ICT, ACT, ACF, and ACCII, not to mention trains, maritime, and cargo handling equipment.

Thank you,

222.14

Teresa Cooke, Executive Director California Hydrogen Coalition

cc: Rajinder Sahota, Deputy Executive Officer Matt Botill, Division Chief Jordan Ramalingam, Manager Katrina Fritz, President & CEO California Hydrogen Business Council



October 16, 2024

Honorable Chair Liane Randolph and Honorable Board Members California Air Resources Board 1001 I Street Sacramento, CA 95814

Subject: Support for California Air Resource Board's Low Carbon Fuel Standard Regulation

Dear Chair Randolph and Honorable Board Members,

On behalf of the Los Angeles Cleantech Incubator (LACI), I am writing in support of the California Air Resources Board's (CARB) Low Carbon Fuel Standard 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 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.

LACI convenes the Transportation Electrification Partnership (TEP), 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. The Partnership'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 for goods movement.

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.

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%

223.1 applaud CARB's proposed 30% reduction in the carbon intensity (Cr) 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, the proposed amendments that expand the current ZEV infrastructure crediting provisions beyond light-duty infrastructure to medium- and heavy-duty infrastructure, while extending the light-duty crediting with an emphasis on equity will help reduce the risk of under-utilized chargers and drive the buildout of necessary infrastructure.

223.3 For these reasons, LACI strongly supports 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.

Best,

Michaelen Krim

Michelle Kinman Senior Vice President, Market Transformation Los Angeles Cleantech Incubator

October 16, 2024



Chair Randolph Liane Randolph Low Carbon Fuel Standard Program 1001 I Street Sacramento, CA 95814

224.1

RE: Low Carbon Fuel Standard Second 15-Day Modifications

Dear Chair Randolph and Members of the California Air Resources Board,

DTE Vantage (DTE) appreciates the opportunity to comment on the second 15-Day modification package to the Low Carbon Fuel Standard (LCFS). 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.

DTE appreciates CARB's efforts to release a second 15-Day modification package following the feedback received on the first 15-Day package on August 12, 2024. We recognize that CARB has incorporated stakeholder feedback and strongly agree with the increase in program targets and the new adjustments to the auto-acceleration mechanism (AAM). We believe these changes are essential to meet the state's emissions reduction goals in the transportation sector while fostering further investment and innovation in clean technologies.

However, we would like to highlight our continued concerns about several key issues which remain or have been introduced in the second 15-Day package:

- 1. The proposed reduction in the number of crediting periods for avoided methane emissions
- 2. The introduction of new restrictions on biomethane pathways are contradictory and will undercut methane reductions
- 3. The continued inclusion of a 4x penalty for instances where a verified CI score exceeds the certified score
- 4. The imposition of deliverability restrictions into the program
- 5. The proposed transition to CA-GREET 4.0 model
- 224.2 We remain grateful for CARB's extensive efforts to solicit feedback from stakeholders who are deeply invested in the LCFS's success, and we respectfully provide additional comments for its consideration.

Avoided Methane Crediting Remains a Key Policy for Enabling RNG Projects and Maximizing GHG Capture

224.3 The first 15-Day package proposed instituting limits on the crediting period for avoided methane emissions projects to two consecutive 10-year crediting periods instead of three for projects breaking ground before January 1, 2030. The second 15-Day package adjusted these

requirements to state that a project certified before the regulation's effective date is allowed three consecutive 10-year crediting periods, and projects certified after the regulation's effective date or after January 1, 2030, will be limited to two consecutive 10-year crediting periods. DTE maintains its strong disapproval of the proposed reduction in crediting periods and does not believe that CARB has demonstrated a rationale for changing this fundamental policy for driving methane capture.

Avoided methane crediting is essential for covering the operating expenses in many existing agricultural and organic waste diversion projects, where commercial viability relies on CI scores from avoided methane. Reducing the crediting periods shortens the available timeframe for recovering capital costs and justifying investments. Until an alternative market exists to support continued methane abatement at agricultural operations, DTE Vantage asks that CARB reverse its proposal to phase out the third avoided methane credit period.

New Provision Effectively Ending RNG to Natural Gas Vehicles by End of Decade will Slow Methane Reductions and Contradicts Other Provisions in Amendment Package

New to the second 15-Day Package, but not included in the staff summary of the material

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cont.

changes, is a major new proposal imposing restrictions on biomethane pathways starting in 2030. Paragraph (g) in section 95482 mandates that for new projects that break ground after December 31, 2029, RNG used in CNG vehicles will receive the CI of natural gas and not the CI of the RNG created after December 31, 2040. This provision has not appeared in previous drafts, and we are concerned that at the very end of this multi-year LCFS amendment process, CARB staff is proposing, for the first time, to end pathways for certain vintage RNG supplying negative CI fuel to trucks, buses and other vehicles. This new restriction will undoubtedly diminish development of new biogas projects several years before the December 31, 2029 deadline as developers will not pursue projects that miss the break ground deadline or begin operation without at least two, ten-year avoided methane crediting periods of LCFS credit generation potential. As a result, this provision curtails an effective tool for eliminating manure related methane emissions at dairies and other facilities, despite other new provisions extending methane abatement credits. DTE strongly objects to the last-minute insertion of this sunset provision that contradicts other changes and will disrupt ongoing efforts to abate methane from agriculture sites.

CARB's Proposed Remedy of a 4x Penalty for CI Exceedance is Excessive and will Disproportionately Impact Agriculture Facilities

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DTE remains concerned with the continued inclusion of a 4x penalty for adjustments when the verified CI exceeds the certified CI for a pathway. Digester-sourced biogas projects have inherent CI variability due to uncontrollable factors like livestock population, manure collection, and weather, which could drastically change the CI score from year to year. Imposing a 4x penalty for adjustments not resulting from misconduct is unwarranted and unfair. DTE Vantage supports adopting a mechanism for refunding excess credits but opposes the punitive 4x penalty, as there is no historical justification for it.

We would continue to encourage CARB to eliminate this multiplier penalty. Instead, we
 encourage CARB to adopt a true-up mechanism whereby excess credits are refunded back to
 CARB, and additional credits are awarded following each annual review showing that a lower CI score was warranted. We believe this would be an acceptable solution to the inherent variability in dairy manure digester pathways.

Proposed Changes to Demonstrate Deliverability into the California Market are Unworkable

224.6 DTE Vantage appreciates the changes that have been made to the previously proposed restrictions on book-and-claim deliveries for bio-CNG, bio-LNG, and bio-L-CNG pathways. While the updated proposal now limits the application of these changes to projects that break ground after December 31, 2029, the restrictions are still not justified, necessary, or comprehensible enough to give projects needed clarity going forward. There is no issue with tracking or double-counting with the existing book-and-claim approach and imposing a future restriction on gas delivery that cannot be verified at the time of construction creates a major obstacle for investors to initiate new projects for the LCFS program.

CARB Should Phase in Changes to GREET Model for Existing Pathways

For existing pathways (including projects that qualified under Tier 2 CI calculations), CARB is proposing to require pathway holders to use the new CA-GREET 4.0 or the revised Tier 1 Calculators, and these new CI scores will be incorporated into fuel transactions starting January 1, 2026. DTE Vantage is concerned that the same project operating in the same manner with the same feedstocks may end up with a materially different CI score due to changes in the GREET model. For these reasons, DTE Vantage urges CARB to provide existing biomethane pathways with a fixed period (such as 5 years) where it can rely on the existing CI score properly calculated under CA-GREET 3.0 and/or Tier 1 before applying this new CI calculation for demonstrating compliance.

DTE Vantage appreciates the opportunity to submit additional feedback on the second 15-Day package. We commend CARB for its ongoing commitment to public engagement throughout the amendment process and look forward to collaborating with the agency on these important issues.

Sincerely,

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Phits O'no

Philip O'Niel Vice President – DTE Vantage

RIVIAN



October 16, 2024

SUBMITTED ELECTRONICALLY AT: www.arb.ca.gov/lispub/comm/iframe_bcsubform.php?listname=lcfs2024

Re: Second Notice of Public Availability of Modified Text and Availability of Additional Documents and Information for the Proposed Low Carbon Fuel Standard Amendments

To Chair Randolph, Honorable Members of the California Air Resources Board ("CARB"), and Staff,

Rivian Automotive, LLC, ("Rivian") appreciates the opportunity to submit 15-day comments in response to the additional modifications released on October 1 as part of the proposed Low Carbon Fuel Standard ("LCFS") amendments. **Rivian remains strongly supportive of the LCFS** and the current rulemaking to update the regulation.

Residential Charging Base Credits

Rivian continues to be extremely encouraged and supportive of the proposal to allow EV manufacturers ("OEMs") to share in base credit generation. Our prior comments highlighted several important benefits of this proposal, and we reiterate those points here by reference.¹ Achieving California's bold EV goals will require every tool at the state's disposal as well as collaboration across industries and stakeholders. CARB's proposal allows for just that, creating opportunities for both automakers and utilities to participate in growing the EV market in ways that reflect their unique market positions.

Final OEM project decisions will necessarily need to reflect the Executive Officer's determination on the allocation of credits as well as market prices and resulting revenue. Nonetheless, Rivian is already considering several possibilities for market-enhancing investments, including expansion of the Rivian Adventure Network. Consider that other OEMs would also be capitalized to fund new initiatives, and it quickly becomes clear why this proposal is potentially so effective and powerful. Automakers will be heavily incentivized to use their base credit revenue to innovate and compete for EV sales.

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¹ Rivian, "Re: Notice of Public Availability of Modified Text and Availability of Additional Documents and Information for the Proposed Low Carbon Fuel Standard Amendments," August 27, 2024, available at www.arb.ca.gov/lists/com-attach/7438-lcfs2024-UCIGaVQjUGpWMQFv.pdf.

RIVIAN



225.2 cont. For instance, the CARB proposal also creates the conditions to address the issue of take-home fleet vehicles. Unlike depot-charged fleets, existing rules that allocate all base credits to utilities prevent take-home fleets from capturing credits from residential charging activity. This is a key blind spot of the LCFS. The cost-benefit analyses for both the ACT and ACF regulations assume fleets will capture charging credits to help 'pencil' the business case for electrification. The proposed changes to base crediting open the door to potential solutions. For example, EV manufacturers could partner with take-home fleet customers to ensure that credit value flows to the fleet owner, whether in the form of an upfront purchase rebate, ongoing dividend, or other benefit. CARB's proposal would facilitate nimble innovation that current program rules simply do not allow.

The latest modifications help solidify aspects of the regulatory language. Explicitly including "OEMs of battery-electric and plug-in hybrid electric vehicles" as opt-in entities in §95483.1 (a)(1)(D) affirmatively positions OEMs as opt-in entities for purposes of base crediting. We also welcome amended language providing for an approval process for administrative costs that exceed 7 percent of total spending.

We find that further clarification of the regulation would be valuable, however. Aspects of the currently proposed regulatory language appear potentially inconsistent and could cause confusion or misinterpretation regarding vehicle and OEM eligibility.

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- §95483 (c)(1)(B) specifies that the Executive Officer may direct base credits to OEMs of *"light-duty* battery-electric or plug-in hybrid electric vehicles" (emphasis added), a term defined elsewhere in the regulation as a vehicle with a gross vehicle weight rating of less than 8,500 pounds.
- §95483.1 (a)(1)(D) makes no such distinction in identifying which OEMs may opt in to the program, referencing simply OEMs "of battery-electric or plug-in hybrid electric vehicles..."
- The Summary of Proposed Modifications refers to "residential" EVs.²

This is an important point of clarification because several automakers, including Rivian, manufacture passenger EVs with a GVWR exceeding 8,500 pounds. As written, §95483 (c)(1)(B) could raise questions about applicability and implementation for automakers of passenger vehicles that straddle the light- and medium-duty boundary. A distinction along these lines

www.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/2nd_15day_notice.pdf.

² California Air Resources Board, *Second Notice of Public Availability of Modified Text and Availability of Additional Documents and/or Information: Proposed Low Carbon Fuel Standard Amendments*, October 1, 2024, p. 5, available at
RIVIAN



would also be inconsistent with both our understanding of the regulatory intent and the longstanding practice of calculating base and incremental credits as a function of residential charging load irrespective of vehicle type.

We recommend avoiding ambiguity by using consistent language throughout. CARB could accomplish this, for example, through a technical amendment to §95483 (c)(1)(B) as suggested here with strikethrough and underlined text.

Base Credits to OEMs. The Executive Officer may direct up to 45% of base credits to eligible OEMs of light-duty battery- electric or plug-in hybrid electric vehicles, if the statewide share of all new zero emission vehicle sales for model year 2024 zero emission vehicles certified under California Code of Regulations, title 13, section 1962.2 is less than 30 percent of total light-duty vehicle sales <u>subject to that regulation</u> for all OEMs in California, based on data reported pursuant to that regulation.

Avoiding reference to specific vehicle classifications would ensure consistency with §95483.1 (a)(1)(D) and the base credit calculation methodology.

Alternatively, CARB could use a future guidance document to resolve any ambiguity.

Third-Party Verification of Electricity Transactions

Rivian welcomes several aspects of the latest modifications. Specifically, Rivian appreciates changes to the third-party verification provisions that:

225.5

- Delay for one year the implementation of verification requirements for electricity transactions.
- Allow verifiers to conduct risk-based site visits at their discretion to sites other than the central records facility.

These changes provide important flexibility and lead time to implement new requirements.

That said, **Rivian continues to believe that CARB should exempt all residential charging activity from verification requirements.** We remain concerned that third-party verification of residential charging raises potential consumer privacy concerns and would at minimum

residential charging raises potential consumer privacy concerns and would at minimum impose a costly burden on LCFS participants without commensurate benefits in return. The additional costs threaten to further erode the already challenging economics of incremental credit generation. The implications of potentially disincentivizing automaker generation of incremental credits include relatively more carbon-intense EV charging and diminished market pressure to accelerate the development of renewable electricity generation.

RIVIAN



CARB should make a small modification to the final regulatory language in §95500(c)(1)(E)(1) (new text underscored).

225.6 cont.

EV Charging except as specified under 95491(d)(3)(A) and 95491(d)(3)(B).

This would exempt both metered and non-metered residential charging from third-party verification.

Rivian greatly appreciates the engagement of CARB staff with stakeholders and this opportunity to provide feedback on the latest modifications. Please do not hesitate to reach out with any questions about our comments.

We look forward to strongly supporting the proposed amendments and the LCFS more broadly at the November hearing.

Sincerely,

Bu K Hen

Tom Van Heeke Senior Policy Advisor, Environmental Rivian Automotive, LLC tvanheeke@rivian.com | 641-888-0035



345 Inverness Drive South Building C, Suite 310 Englewood, CO 80112 т 303-858-8358 F 303-858-8431 gevo.com

October 15, 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 Second 15-Day Notice of Changes to the Proposed Low Carbon Fuel Standard Amendments

Dear Chair Randolph:

Gevo, Inc. ("Gevo") appreciates this opportunity to comment on the California Air Resources Board ("CARB") Second 15-Day Notice of Changes to the Proposed Low Carbon Fuel Standard ("LCFS") Amendments, issued on October 1, 2024 (hereinafter "Second 15-Day Notice"). Gevo submitted comments on CARB's proposed LCFS amendments on February 20, 2024, on the content of the CARB Workshop held on April 10, 2024, and on the first 15-Day notice on August 27, 2024, and we incorporate each of those comments here by reference.¹ Although we continue to urge CARB's consideration of all of the comments we previously submitted, the comments here relate to areas elaborated in the Second 15-Day Notice, as specified by CARB in its Second Notice of Public Availability of Modified Text and Availability of Additional Documents and/or Information Proposed Low Carbon Fuel Standard Amendments.²

As a refresher, 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.

¹ *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); Gevo, Inc.'s "Comments on the Low Carbon Fuel Standard Workshop, April 10, 2024" (May 10, 2024) (available in CARB's LCFS Meetings and Workshops portal); and Gevo, Inc's "Comments on 15-Day Notice of Changes to the Proposed Low Carbon Fuel Standard Amendments" (August 27, 2024).

² CARB, Second Notice of Public Availability of Modified Text and Availability of Additional Documents and/or Information Proposed Low Carbon Fuel Standard Amendments, at 3 (October 1, 2024) (noting that "staff will only address comments received during this 15-day comment period that are responsive to this notice, documents added to the record, or the changes detailed" in attachments to the notice.)

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, Gevo has plans to participate in the LCFS with low-carbon products from our alcohol-to-hydrocarbons production process, which 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")³ 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 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. Upon completion of our NZ1 production facility, 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.

I. Gevo Strongly Supports CARB's Proposed Modification to the Trigger for the Automatic Acceleration Mechanism (Section 95484)

In each of our earlier sets of comments, Gevo supported CARB's intent to adopt an Automatic Acceleration Mechanism ("AAM") to advance CI adjustments as needed to respond to LCFS market conditions. Gevo strongly supports CARB's proposal in the Second 15-Day Notice to have the trigger for the AAM be based on the four most recent quarters of reporting, making a quarterly announcement regarding whether the AAM is triggered, rather than using a calendar year for the trigger and making an annual

226.1

³ 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.

announcement. As CARB recognized in making the current proposal, switching from a calendar year of data to the most recent four quarters of data as the determination for the AAM trigger will allow for greater transparency and market certainty to LCFS participants, thereby strengthening the market pull of the LCFS and increasing the GHG emissions savings it achieves. Accordingly, Gevo urges CARB to adopt this proposal.

II. Gevo Urges CARB to Make the Renewable Naphtha Definition Feedstock and Process Neutral

Throughout this LCFS revision cycle, CARB has revised various definitions to better reflect the array of feedstocks and processes that generate renewable fuels. As noted in our August 27 comments on the first 15-Day Notice, we strongly supported CARB's proposal to make the "renewable diesel" definition process- and feedstock- neutral and we see in the Second 15-Day Notice additional efforts by CARB to better reflect an array of processes in definitions involving LCFS eligibility (for example, the proposal to expand the definition of "recovered organics.") While we were pleased that CARB provided a new proposal for the "renewable diesel" definition in the 15-Day Notice that would make it process- and feedstock-neutral, and note that the definitions of biomethane, renewable gasoline, renewable propane and several others are similarly neutral as to process and feedstock, we are concerned that CARB still has not proposed a corresponding change to the "renewable naphtha" definition. As we had noted in our previous comments, there is no rational reason for excluding from LCFS eligibility the renewable naphtha from a process such as Gevo's. Accordingly, we urge CARB to also make the "renewable naphtha" definition neutral as to non-petroleum feedstocks and production processes.

III. Gevo Supports CARB's Proposal to Retain Three Ten-Year Crediting Periods for Early Adopters and Urges CARB to Eschew Crediting Time Limits for All Avoided Methane Projects (Section 95488.9(f)(3)(A))

In the Second 15-Day Notice, CARB has withdrawn its proposal from the first 15-Day Notice that would have reduced the total number of crediting periods for pre-2030 avoided methane emissions projects from dairy and swine manure and landfill-diverted organic waste disposal to two 10-year crediting periods, proposing instead in Section 95488.9(f)(3)(A) to retain the three 10-year periods in the original LCFS proposal. Gevo supports CARB's proposal to revert back to three 10-year crediting periods for these projects, though, as we have previously commented, we believe that the inclusion of any crediting limit (whether for pre-2030 projects or those that commence in 2030 or later) unnecessarily stifles investment in these important projects and limits the climate benefit avoided methane projects can bring.

As we noted in our previous comments, Gevo participates in the LCFS via the RNG captured from three dairies, for which we installed dairy manure biomethane capture

226.2

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."⁴ In addition, we note that use of dairy digesters creates synergistic environmental benefits, as farmers can generate soil amendments that provide nutrients and decrease the amount of fertilizer needed.⁵

226.3 In our previous comments, Gevo supported CARB's proposal to continue avoided cont. methane crediting, including for dairy RNG, and we urged CARB to decline to impose time limits (or other restrictions) on such crediting. As we noted, dairy manure methane avoidance projects such as ours require significant capital investment and carry with them significant ongoing operating costs. Accordingly, limits on the crediting period for such projects would not only inhibit initial investment but also would threaten the viability of continuing methane avoidance operations over time. By restoring the crediting period for pre-2030 biomethane projects to three 10-year periods, these avoided methane projects will be able to bring needed climate benefits for longer.

While supporting the provision in the Second 15-Day Notice for pre-2030 avoided methane projects, Gevo continues to question why CARB would limit these pre-2030 projects to only three crediting periods and we urge CARB to decline to place crediting time limits on any avoided methane projects.

IV. Gevo Supports CARB's Proposal to Remove the Potential Statutory Change Limit for Early Dairy Biomethane Adopters (Section 95488.9(f)(3)(B))

In the Second 15-Day Notice, CARB has proposed to revise the existing regulation applying to pre-2030 dairy biomethane projects that states that "if a 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, 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

⁴ California Air Resources Board, "Proposed Amendments to the Low Carbon Fuel Standard Initial Statement of Reasons," Dec. 19, 2023, at page 124.

⁵ 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.

226.4 cont. period and may not request any subsequent crediting periods." Gevo supports this proposal because, as CARB notes in the Second 15-Day Notice, it supports California's "methane reduction goals by providing incentive certainty for project developers for methane capture projects." At the same time, however, we question why CARB would retain the existing provision for 2030+ projects, as all dairy biomethane projects that bring emissions reductions need investment certainty.

V. Conclusion

Thank you for the opportunity to comment on the Second 15-Day Notice of additional changes to the Low Carbon Fuel Standard amendments proposal. 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,

L+LA

Kent Hartwig Director of State Government Affairs Gevo, Inc.

Namy N Your

Nancy N. Young Chief Sustainability Officer Gevo, Inc.

FIRSTELEMENT FUEL

FirstElement Fuel Inc. | 5281 California Ave, Suite 260, Irvine, CA 92617 | 949-205-5553

October 16, 2024

Ms. Rajinder Sahota Deputy Executive Officer, Climate Change and Research California Air Resources Board 1001 | Street, Sacramento California 95814

Subject: LCFS Second 15-day Notice Comments

Dear Ms. Sahota,

FirstElement Fuel (FEF) appreciates your and your staff's continued work in incorporating 227.1 many of the comments from our industry, in particular, the removal of the 50% derate for the Light- and Medium-Duty Hydrogen Refueling Infrastructure (LMD-HRI) capacity credit. Our biggest remaining concern is the 1.5 times capital expenditure (capex) limit to the cumulative recovery of LCFS credits for an LMD or Heavy-duty (HD) hydrogen refueling 227.2 station (HRS).

Existing HRI Program Works

The current LD HRI program has a 15-year timeframe and a capacity limit of 1,200 kg/d. The HRI program is intended to de-risk the building of stations before sufficient vehicle demand can sustain the HRS. The program is designed to be self-regulating and self-sunsetting with HRI credits never exceeding revenue from H2 sales. Under this rubric, and when LCFS credit prices were above \$100/ton, FEF was able to attract sufficient capital to build stations without capital grants from the state and expand the network of stations. The HRI also enabled us to keep hydrogen prices stable as LCFS prices fluctuated and, for a period of time, helped us maintain pump prices even when credit prices started to fall below \$100/ton. In short, the HRI was accomplishing its intent by addressing the "chicken-or-theegg" conundrum.

Proposed Capex Limit Increases Risk

The revised LMD-HRI and HD-HRI, however, now put significant risks on station providers by limiting the HRI period to 10 years and capping the cumulative incentive amount received to 1.5 times the capex of the station, which is a double constraint. Although the 10-year program limit is challenging, the greater obstacle is the 1.5x capex limit. For example, if LCFS prices rise above \$100/ton, which is the intent of the step-down and strengthening of the program, station operators could reach their capex limit well before 10 years. But if vehicle rollout lags and there is limited H2 demand, the station operator will have no other revenue source and will be forced to increase pump prices to maintain operations. This would discourage further vehicle deployments, reduce current demand, and result in further raising of prices at the pump. This scenario is illustrated in the figure below, where there is no financial support once the HRI reaches the capex limit (year 5). This is the exact opposite of what the HRI is intended to accomplish.

227.3

227.4

FIRSTELEMENT FUE

FirstElement Fuel Inc. | 5281 California Ave, Suite 260, Irvine, CA 92617 | 949-205-5553



Figure 1: Slow Vehicle Rollout with Capex Limit

We strongly urge removing the 1.5 capex limit to support stations in the event vehicle 227.4rollout is slow and demand is low, as originally intended by the policy. Attached to this letter are additional slides with scenarios showing the differences between slow and aggressive vehicle rollouts with and without the capex limit.

Stations in Queue

FEF has over 40 LD stations yet to be built which were awarded by the CEC under various programs. We have made significant investments in site leases, entitlements, and long lead time equipment with the understanding that the investment risk would be based on the current HRI program of 15 years and 1,200 kg/d capacity. With the introduction of MD trucks at the end of the decade, we will also need to upgrade equipment and increase station capacity, thereby further increasing costs. As such, at the very least, we request that any stations previously awarded through competitive solicitations by the CEC be grandfathered into the existing HRI program at the 1,200 kg/d capacity cap without the capex limit.

We appreciate CARB staff's work on enabling zero-emissions transportation technologies, and our company was built to enable these same goals through infrastructure. Indeed, the LCFS HRI program is critical to our continued success. However, constraining the HRI program with the capex limits puts greater risk on the station developers since the vehicle rollout is beyond our control. We look forward to working with staff to implement this critical change.

Respectfully,

Matt Miyasato, Ph.D. Chief Public Policy & Programs Officer

227.6

227.5

cont.

2024 Updates to HRI Regulation:

Negative Impacts of the 1.5x CAPEX recovery limitation

October 2024

Overview

Original HRI Policy Rationale and Benefits

The HRI policy was originally designed to spur the development of hydrogen stations <u>ahead of cars</u>, while providing some financial <u>protection</u> <u>against the risk</u> of hydrogen vehicles rolling out slowly. It assures revenue to support a station's <u>operating costs</u> regardless of the pace at which vehicles rollout.

Furthermore, the policy was designed to be <u>self-regulating</u> and <u>self-sunsetting</u>.

- If vehicle rollout is slower, stations generate more HRI to support their operations in lieu of revenue from sales. If hydro gen station
 capacity exceeds vehicle rollout by too large a margin, then the HRI availability for new stations is exhausted, which is app ropriate so that
 station buildout does not get too far ahead of vehicles.
- If vehicle rollout is faster, stations generation less HRI because they are making revenue from sales. Also, HRI credits remain available for new stations to enter the program to keep the station capacity ahead of vehicle growth.

The original HRI policy yielded <u>the following benefits</u> when LCFS credit values were healthy (this list is not inclusive of all the benefits, such as lower CI and higher renewable content of hydrogen, which were also incentivized by the policy):

- Unlocked private investment to build stations ahead of cars
- Resulted in a lower price at the pump even during early years of lower station utilization
- Spurred significant investment in engineering and R&D to improve hydrogen station performance and reliability
- Encouraged the installation of higher volume stations that could serve more cars with fewer lines and wait times

The 1.5x CAPEX Recovery Limit Undermines the Rationale and Benefits of the HRI Policy

Adding the CAPEX recovery limit to the program incentivizes the opposite of what was intended:

- If vehicle rollout is slower, a station will hit the 1.5x CAPEX limit and exhaust its HRI crediting window faster leaving it without revenue support for station operating costs precisely in a downside situation when the support is needed. Furthermore, HRI credits b ecome available for more new stations to enter the program, further exacerbating a situation when utilization is low at the existing stations. Stations will be faced with a decision to close, or to significantly raise the price of fuel at the pump to bring in more revenue.
- If vehicle rollout is faster, a station will hit the 1.5x CAPEX limit and exhaust its HRI crediting window more slowly, which means it will benefit from HRI generation for a longer period of time even though revenue from vehicle sales are higher than in a downside case.

The CAPEX recovery limit changes the entire investment profile of the station. Rather than helping assure revenues while the station is operating, it is about CAPEX recovery. The effect is that private investment will be more difficult to tap and hedge against vehicle rollouts.

There is also a risk of stations being operated poorly or shut down once HRI crediting hits the limit and is exhausted.

<u>Heavy Duty HRI</u>: Comparison of Slow Vehicle Rollout v. Fast Vehicle Rollout With a 1.5x CAPEX Recovery Limit



Downside Scenario (Vehicle Rollout is Slower)



Upside Scenario (Vehicle Rollout is Aggressive)

CONCLUSION: Introducing a CAPEX recovery limitation *breaks* the HRI policy – it results in the opposite of its intention

- The CAPEX recovery limitation undermines the HRI Policy's intention: to support a hydrogen station's operations with revenueeven in the case of slower vehicle rollout / lower utilization. It should enable a station operator to put resources towards operating a station well and reflecting a price at the pump that is representative of a higher utilization, even if utilization is not high.
- The CAPEX recovery limitation causes stations with lower utilization to run out of HRI crediting sooner, which is the opposite of the desired effect. Stations with lower utilization should be able to rely on more HRI crediting tomaintain operations.
- Once the HRI limit is reached, stations will be faced with a choice to either (a) shut down, or (b) significantly raise price of fuel. Raising the price of fuel will kick off a vicious cycle, because high fuel prices are discouraging to the market and will further slow vehicle rollout.

Assumptions:	LCFS Credit Value	Station CAPEX after grant funding	Station Capacity
	\$150	\$8,000,000	600 <i>0 kg</i> pd

<u>Heavy Duty HRI</u>: Comparison of Slower Vehicle Rollout v. Faster Vehicle Rollout With No 1.5x CAPEX Recovery Limit

Downside Scenario (Vehicle Rollout is Slower) with no CAPEX recovery limitation



Upside Scenario (Vehicle Rollout is Aggressive) with no CAPEX recovery limit



CONCLUSION: The policy is Self regulating and does not need or benefit from a CAPEX recovery limitation

- Lower hydrogen station utilization means that vehicles are rolling out slower. Therefore, it is OK if stations are consuming more of the HRI credits because otherwise the buildout of stations would get too far out in front of the vehicle volumes.
- Higher hydrogen station utilization means that vehicles are rolling out at a faster pace. In this case, the stations are consuming less HRI credits, which makes more credits available to new stations entering the program. This is appropriate in the case that vehicle rollout is more aggressive.

Assumptions:	LCFS Credit Value	Station CAPEX after grant funding	Station Capacity
	\$150	\$8,000,000	6000 kgpd

Light Duty HRI: Comparison of Slow Vehicle Rollout v. Fast Vehicle Rollout With and Without 1.5x CAPEX Recovery Limit

The same conclusions hold true for Light Duty Stations.

Downside Scenario (Vehicle Rollout is Slower) with no CAPEX recovery limitation

Upside Scenario (Vehicle Rollout is Aggressive) with no CAPEX recovery limit



Assumptions:	LCFS Credit Value	Station CAPEX after grant funding	Station Capacity
_	\$150	\$3,500,000	1200 kgpd



October 16, 2024

California Air Resources Board 1001 | Street Sacramento, CA 95814

RE: Comments LCFS Amendments – 2nd 15-Day Changes

Dear California Air Resources Board,

Louis Dreyfus Company (LDC) appreciates the opportunity to comment on the California Air Resources Board's (CARB) proposed amendments to the California Low Carbon Fuel Standard (LCFS). LDC is a leading merchant and processor of agricultural goods. We're processors of both soy and canola in North America, producers of both biomass-based diesel and ethanol and our customer base includes all renewable diesel producers selling product into the California markets today.

- 228.1 We appreciate the changes to the vegetable oil cap language posed in this second set of 15-day changes. The updated grandfathering provision provides an even playing field for all biomass-based diesel producers, and the clarification on mechanics is very helpful for the industry.
- 228.2 However, these updates did not address the fundamental issues with the 20 percent vegetable oil cap. Namely, this cap is not based on any technical or scientific analysis; the calculated 20 percent limit is based on incomplete data; and the cap fails to promote true environmental benefits.

Lack of Technical or Scientific Basis

Firstly, CARB has not provided technical or scientific analysis supporting the 20 percent cap. The published Standardized Regulatory Impact Assessment (SRIA) makes no mention of this cap,¹ while the Initial Statement of Reasons (ISOR) addresses a cap in passing, with the analyzed scenario causing an *increase* in **fossil fuels and GHG emissions**.² During LDC's conversations with multiple CARB board members, none were able to explain the source or scientific rationale for the 20 percent limit. One member described it as a "magic number," while another believed it had little scientific backing, while being "directionally correct." All members that we engaged expressed a desire for a more in-depth, scientifically driven approach to regulating soy and canola feedstocks rather than a blunt cap.

Incomplete Public Data

228.4

We understand from conversations with staff that the 20 percent cap is intended to approximate soy and canola BBD market share in 2023. However, this estimate is based on incomplete data and takes into account only soy biodiesel, soy renewable diesel, and canola biodiesel. Notably absent from this calculation is 279 million gallons of canola renewable diesel, which is accounted for under "RD – Other" in

¹ https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/appc-1.pdf

² https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/isor.pdf



228.4 the quarterly summary.³ Including this canola renewable diesel produces a fraction of 32 percent rather than 20 percent.⁴ We urge CARB to make this data public and to reconsider its calculation. If this is not possible, then renewable diesel produced from canola oil should be exempt from the 20 percent cap as it was not considered in the original estimate.

Moreover, the decision to cap soy and canola BBD at 2023 levels, even if calculated correctly, constitutes
 a substantial change to the regulatory provisions and is not related to the original proposal, and should therefore require a 45-day notice in the California Regulatory Notice Register.

Failure to Promote Environmental Benefits

Finally, the 20 percent cap fails to promote true environmental benefits. Based on our conversations with board members and other stakeholders, the cap is designed for three separate outcomes: limit land use change around the globe, improve conditions for disadvantaged communities, and address competition between food and fuel applications. This provision falls short in all three respects.

With respect to land use change, the displacement of domestically sourced soybean and canola oils promotes the imports of tallows and used cooking oils (UCOs) from countries flagged by environmental groups as suffering from high rates of deforestation and land conversion. We are seeing this happen with the explosion of UCO shipments from China and Southeast Asia and the increase in tallow shipments from South America. These products are backfilled in their host countries' own BBD mandates by locally produced palm and soy oils which have been attributed to deforestation. By contrast, Canada and the United States have not converted forest to farmland in decades, making domestic soy and canola a deforestation-free option. A vote for this proposal is a vote for deforestation.

This cap also fails to improve the economic situation of marginalized communities. It disadvantages inland BBD plants which employ thousands of people but are situated far from and have limited access to coastal ports that receive imported waste feedstocks. This will negatively impact the economic viability of these inland plants, impacting jobs in these rural communities. Additionally, this policy change is designed to material increase LCFS credit prices which will result in higher retail gasoline and diesel prices for all within the state.

With respect to the food vs fuel debate, this is non-issue as of this time for multiple reasons. The US & Canadian agricultural industries have invested a combined \$8+ billion USD in expanded soybean and canola processing capacity, increasing the availability of soybean and canola oil and meal. It is also important to note that oil makes up only 20% of the content of a soybean; ⁵ increased processing in North America drives greater availability of soybean meal which in turn has positive impacts for animal food products pricing. Additionally, row crop prices are at multi-year lows, even as crop usage grows within the LCFS program.

228.9 In summary, the proposed LCFS revisions compromise the long-term health and viability of the U.S. agricultural industry, while providing limited environmental and economic benefits for the state of

³ <u>https://ww2.arb.ca.gov/resources/documents/low-carbon-fuel-standard-reporting-tool-quarterly-summaries;</u> The only renewable diesel feedstock not listed separately in the quarterly data is canola oil when compared to the public pathways list.

⁴ https://ww2.arb.ca.gov/resources/documents/low-carbon-fuel-standard-reporting-tool-quarterly-summaries ⁵ CA-GREET3.0



228.9 cont. California. We appreciate CARB's changes in this 15-day comment period, but urge CARB to make the canola renewable diesel data public and reconsider the cap levels so as not to stunt the efficiently operating renewable fuels industry put in place by the LCFS.

Thank you again for the opportunity to comment on this important issue. For a more thorough in-depth discussion of the cap, please reference our previous letter.⁶ If CARB has any questions concerning this letter, please feel free to reach out to me at JONATHAN.SNOEBERGER@ldc.com.

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Jonathan Snoeberger Regulatory Compliance Manager

⁶ https://www.arb.ca.gov/lists/com-attach/7343-lcfs2024-Am5RNANkWXlQCVAz.pdf

Here is the comment you selected to display.

Comment 229 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Roland
Last Name	Walker
Email Address	Non-web submitted comment
Affiliation	
Subject	Rising Fuel Prices – Proposed Changes Will Make Things Worse

Comment

Comment received during 2nd 15-Day Comment Period. Comment submitted by Clerk on Commenter's behalf.

"I'm not a Republican, but I agree with this:

https://src.senate.ca.gov/sites/src.senate.ca.gov/files/10.15.2024%20SREP-AREP%20Letter%20to%2(

Where's your accountability to the general public? Shame on you."

Attachment www.arb.ca.gov/lists/com-attach/51-lcfs2024-2nd15day-VGVSZAEuVTdSYQgm.pdf

Original 10.15.2024 SREP-AREP Letter to CARB.pdf

File Name

Date and 2024-10-18 11:33:00

Time

Comment

Was

Submitted

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

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Comment 229 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Roland
Last Name	Walker
Email Address	Non-web submitted comment
Affiliation	
Subject	Rising Fuel Prices – Proposed Changes Will Make Things Worse

Comment	Comment received during 2nd 15-Day Comment Period. Comment submitted by Clerk on Commenter's behalf.
	"I'm not a Republican, but I agree with this:
229.1	<pre>https://src.senate.ca.gov/sites/src.senate.ca.gov/files/10.15.2024%20SREP-AREP%20Letter%20to%2(</pre>

Where's your accountability to the general public? Shame on you."

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CALIFORNIA LEGISLATIVE REPUBLICANS



October 15, 2024

The Honorable Liane Randolph Chair, California Air Resources Board 1001 I Street Sacramento, California 95814

Dear Chair Randolph,

California motorists are already paying \$1.50 more per gallon for gasoline than the national average price of the other 47 continental states. It is with this in mind that we write you again with serious concerns about the proposed amendments to the Low-Carbon Fuels Standard (LCFS) program that will drive up fuel prices.

We regret that the California Air Resources Board (CARB) refuses to release any analysis of how its proposed LCFS amendments will affect gas prices in California.

As Los Angeles Times columnist George Skelton wrote over the weekend:

"A year ago the air board (CARB) estimated that the new regulation could raise gas prices by 47 cents a gallon because of refinery costs passed on the consumers. A separate study placed the pump cost much higher – 65 cents a gallon. Now the air board has backed off its 47-cent price hike estimate. And it refuses to offer a revised forecast . . . So an unelected bunch of regulators can arbitrarily adopt new rules without weighing the costs to consumers? Doesn't seem right. Seems a bit irresponsible and arrogant."

We concur with Skelton's assessment that CARB is being irresponsible at the expense of everyday Californians struggling with the affordability of basic needs. If CARB wants the public, through their elected representatives, to be supportive of new initiatives to protect the environment, CARB should be forthcoming with all information – so the public can consider the costs and benefits.

In an effort to prompt those disclosures, we requested in a May 14, 2024, letter that CARB provide answers to specific questions about the proposed amendments to the LCFS program. We have updated those here:

- 1. What are the anticipated costs of LCFS, and what should consumers anticipate paying per gallon if enacted?
- 2. When will CARB perform a combined analysis of the pass-through of LCFS credit prices?
- 3. Will the proposed amendments to LCFS in fact cost consumers up to 47-cents per gallon in 2025 and 52-cents in 2026, or is the Cullenward study mentioned in the Skelton column more accurate in predicting that gas prices will increase by 65- to 85-cents? What direct or indirect impacts does the LCFS program have on the price of gas for consumers?

The September 23 letter we received in response did not address these issues. Instead, it continued to advance the narrative that the LCFS program has minimal impact on gas prices. It is absurd that CARB takes such a position when its own Initial Statement of Reasons Assessment predicted an increase in costs to consumers.

We urge CARB to delay and reschedule its November hearings and its vote on the amendments to the LCFS program.

Without specific information from CARB, it is reasonable to assume that its adoption of these amended regulations will directly increase gas prices by up to \$0.65 in the near term, up to \$0.85 per gallon by 2030, and up to \$1.50 per gallon by 2035, as outlined in the Cullenward report.

For years, in policy committee hearings, budget hearings, and Senate confirmation hearings, CARB has repeatedly stated to the Legislature that it values transparency and is committed to providing full and complete information on its proposals to the public, media, and the Legislature.

Additionally, many CARB members have indicated they understand, and will consider, how the effects of CARB's actions will disproportionally affect disadvantaged, low-income, and struggling communities in California.

The right thing for CARB to do is to postpone the LCFS hearing on the proposed amendments and immediately disclose the actual benefits and true costs to Californians, and facilitate public participation in these important policy decisions.

We appreciate your consideration of our request.

Sincerely,

Rosilicie Ochoa Bogh Senator, 23rd District

Greg Wallis Assemblymember, 47th District

Brian Table

Brian Dahle Senator, 1st District

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Megan Dahle Assemblymember, 1st District

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Marie Alvarado-Gil Senator, 4th District

Tames Gallagher Assembly Republican Leader Assemblymember, 3rd District

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Roger Niello Senator, 6th District

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Joe Patterson Assemblymember, 5th District

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Shannon Grove Senator, 12th District

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Scott Wilk Senator, 21st District

Josh Hoover Assemblymember, 7th District

Jim Patterson Assemblymember, 8th District

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Kelly Seyarto Senate Republican Caucus Chair Senator, 32nd District

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Heath Flora Assemblymember, 9th District

Janet Nguyen Senator, 36th District

Brian W. Jones Senate Minority Leader Senator, 40th District

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Tom Lackey Assembly Republican Caucus Chair Assemblymember, 34th District

[/] Bill Essayli Assemblymember, 63rd District

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Juan Alanis Assemblymember, 22nd District

Devon J. Mathis Assemblymember, 33rd District

Phillip Cher

Phillip Chen Assemblymember, 59th District

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Kate Sanchez Assemblymember, 71st District

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Laurie Davies Assemblymember, 74th District

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Diane Dixon Assemblymember, 72nd District

Here is the comment you selected to display.

Comment 230 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Robert	
Last Name	Seddon	
Email Address	Non-web submitted comment	
Affiliation		
Subject	"Proposed Low Carbon Fuel Amendments" i	
Comment	Comment received during 2nd 15-Day Comment Period. Comment submitted by Clerk on Commenter's behalf.	
230.1	"I am requesting a delay in the vote on the "Proposed Low Carbon Fuel Amendments" until updated cost projections are provided to the public."	

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-18 11:33:00

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

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Here is the comment you selected to display.

Comment 231 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Natalie	
Last Name	Jung	
Email Address	Non-web submitted comment	
Affiliation		
Subject	Proposed Low Carbon Fuel Amendment	
Comment	Comment received during 2nd 15-Day Comment Period. Comment submitted by Clerk on Commenter's behalf. "hi, Please postpone the vote until you are transparent on what the price of gas will be increased by. Isn't fuel high enough? Isn't inflation high enough for us to deal with already? Thanks"	

Submitted

Comment Log Display

Attachment	www.arb.ca.gov/lists/com-attach/53-lcfs2024-2nd15day- AjNVY1F+UDILOAQq.pdf
Original File Name	10.15.2024SREP-AREPLettertoCARB.pdf
Date and Time Comment Was	2024-10-18 11:33:00

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

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Here is the comment you selected to display.

Comment 231 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Natalie
Last Name	Jung
Email Address	Non-web submitted comment
Affiliation	
Subject	Proposed Low Carbon Fuel Amendment
Comment	Comment received during 2nd 15-Day Comment Period. Comment submitted by Clerk on Commenter's behalf.
	"hi,
231.1	Please postpone the vote until you are transparent on what the price of gas will be increased by. Isn't fuel high enough? Isn't inflation high enough for us to deal with already? Thanks"

Submitted

Comment Log Display

Attachment	www.arb.ca.gov/lists/com-attach/53-lcfs2024-2nd15day- AjNVY1F+UDILOAQq.pdf
Original File Name	10.15.2024SREP-AREPLettertoCARB.pdf
Date and Time Comment Was	2024-10-18 11:33:00

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CALIFORNIA LEGISLATIVE REPUBLICANS



October 15, 2024

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Dear Chair Randolph,

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We regret that the California Air Resources Board (CARB) refuses to release any analysis of how its proposed LCFS amendments will affect gas prices in California.

As Los Angeles Times columnist George Skelton wrote over the weekend:

"A year ago the air board (CARB) estimated that the new regulation could raise gas prices by 47 cents a gallon because of refinery costs passed on the consumers. A separate study placed the pump cost much higher – 65 cents a gallon. Now the air board has backed off its 47-cent price hike estimate. And it refuses to offer a revised forecast . . . So an unelected bunch of regulators can arbitrarily adopt new rules without weighing the costs to consumers? Doesn't seem right. Seems a bit irresponsible and arrogant."

We concur with Skelton's assessment that CARB is being irresponsible at the expense of everyday Californians struggling with the affordability of basic needs. If CARB wants the public, through their elected representatives, to be supportive of new initiatives to protect the environment, CARB should be forthcoming with all information – so the public can consider the costs and benefits.

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- 1. What are the anticipated costs of LCFS, and what should consumers anticipate paying per gallon if enacted?
- 2. When will CARB perform a combined analysis of the pass-through of LCFS credit prices?
- 3. Will the proposed amendments to LCFS in fact cost consumers up to 47-cents per gallon in 2025 and 52-cents in 2026, or is the Cullenward study mentioned in the Skelton column more accurate in predicting that gas prices will increase by 65- to 85-cents? What direct or indirect impacts does the LCFS program have on the price of gas for consumers?

The September 23 letter we received in response did not address these issues. Instead, it continued to advance the narrative that the LCFS program has minimal impact on gas prices. It is absurd that CARB takes such a position when its own Initial Statement of Reasons Assessment predicted an increase in costs to consumers.

We urge CARB to delay and reschedule its November hearings and its vote on the amendments to the LCFS program.

Without specific information from CARB, it is reasonable to assume that its adoption of these amended regulations will directly increase gas prices by up to \$0.65 in the near term, up to \$0.85 per gallon by 2030, and up to \$1.50 per gallon by 2035, as outlined in the Cullenward report.

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Additionally, many CARB members have indicated they understand, and will consider, how the effects of CARB's actions will disproportionally affect disadvantaged, low-income, and struggling communities in California.

The right thing for CARB to do is to postpone the LCFS hearing on the proposed amendments and immediately disclose the actual benefits and true costs to Californians, and facilitate public participation in these important policy decisions.

We appreciate your consideration of our request.

Sincerely,

Rosilicie Ochoa Bogh Senator, 23rd District

Greg Wallis Assemblymember, 47th District

Brian Table

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Marie Alvarado-Gil Senator, 4th District

Tames Gallagher Assembly Republican Leader Assemblymember, 3rd District

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Roger Niello Senator, 6th District

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Joe Patterson Assemblymember, 5th District

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Shannon Grove Senator, 12th District

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Scott Wilk Senator, 21st District

Josh Hoover Assemblymember, 7th District

Jim Patterson Assemblymember, 8th District

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Kelly Seyarto Senate Republican Caucus Chair Senator, 32nd District

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Heath Flora Assemblymember, 9th District

Janet Nguyen Senator, 36th District

Brian W. Jones Senate Minority Leader Senator, 40th District

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Tom Lackey Assembly Republican Caucus Chair Assemblymember, 34th District

[/] Bill Essayli Assemblymember, 63rd District

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Juan Alanis Assemblymember, 22nd District

Devon J. Mathis Assemblymember, 33rd District

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Phillip Chen Assemblymember, 59th District

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Tri Ta Assemblymember, 70th District
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Kate Sanchez Assemblymember, 71st District

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Laurie Davies Assemblymember, 74th District

Dine D. Diam

Diane Dixon Assemblymember, 72nd District

Here is the comment you selected to display.

Comment 232 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Richard
Last Name	Zalewski
Email Address	Non-web submitted comment
Affiliation	
Subject	"Proposed Low Carbon Fuel Amendment"

Comment	Comment received during 2nd 15-Day Comment Period. Comment submitted by Clerk on Commenter's behalf. "Dear Chair Randolph,
	California motorists are already paying \$1.50 more per gallon for
	gasoline than the national average price of the other 47
	continental states. It is with this in mind that we write you again
232 1	with serious concerns about the proposed amendments to the
202.1	Low-Carbon Fuels Standard (LCFS) program that will drive up fuel
	prices. We regret that the California Air Resources Board (CARB)
	refuses to release any analysis of how its proposed LCFS amendments
	will affect gas prices in California.
	Sincerely, from a 75yo who would like to afford to stay in California. "

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-18 11:33:00

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Board Comments Home

Here is the comment you selected to display.

Comment 233 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Larry
Last Name	Workman
Email Address	Non-web submitted comment
Affiliation	
Subject	"Proposed Low Carbon Fuel Amendment"

Comment	Comment received during 2nd 15-Day Comment Period. Comment submitted by Clerk on Commenter's behalf.
	"DON'T RAISE THE TAX ON GASOLINE!
	Californians are currently paying \$1.50 more per gallon for gasoline than the national average. Now, new amendments proposed by
233.1	the California Air Resources Board (CARB) under the Low-Carbon
	Fuels Standard (LCFS) program could make this even worse, driving
	prices up by as much as \$0.85 per gallon soon and up to \$1.50 per
	gallon by 2035."
Attachment	

Original File Name

Date and Time Comment Was Submitted

2024-10-18 11:33:00

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Board Comments Home



October 16, 2024

SUBMITTED ELECTRONICALLY https://ww2.arb.ca.gov/applications/public-comments

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

Subject: Low Carbon Fuel Standard – Second 15-Day Notice Comments

The Alliance for Automotive Innovation (Auto Innovators)¹ and our members appreciate the opportunity to comment on the Second proposed 15-Day changes to the Low Carbon Fuel Standard (LCFS).² We recommend using funding generated by light-duty (LD) electric vehicles (EVs) to promote and expand the LD EV market to all California communities, rather than using that funding for unrelated medium- and heavy-duty (MD and HD) EV projects.

- Automakers are committed to electrification of the light-duty vehicle market. However, this transition is far from complete. In fact, EV sales have plateaued in California at around 25 percent for the last 9 months. Far higher sales are needed in the next few years to meet the growing EV regulatory requirements of 43% in 2027, 51% in 2028, or 68% in 2030. Reaching these levels requires sales far beyond the affluent single-family homeowners that currently purchase most EVs. The substantial resources associated with the LCFS program should promote EVs and expand the EV market to all communities. However, this will not be the case if the LCFS proceeds from LD EVs are used to fund MD and HD EV projects.
- 234.2

We continue to support regulatory provisions that allow up to 45 percent of the base credits generated by LD EV residential charging to the automakers (aka, "OEMs") producing those

https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/2nd 15day notice.pdf

¹ Auto Innovators represents the full auto industry, including the manufacturers producing most vehicles sold in the U.S., equipment suppliers, battery producers, semiconductor makers, technology companies, and autonomous vehicle developers. Our mission is to work with policymakers to realize a cleaner, safer, and smarter transportation future and to maintain U.S. competitiveness in cutting-edge automotive technology. Representing approximately 5 percent of the country's GDP, responsible for supporting nearly 10 million jobs, and driving \$1 trillion in annual economic activity, the automotive industry is the nation's largest manufacturing sector. (www.autosinnovate.org)

² California Air Resources Board. (2024, August 12). *Second Notice of Public Availability of Modified Text and Availability of Additional Documents and/or Information Proposed Low Carbon Fuel Standard Amendments*. Retrieved October 7, 2024, from

234.2 vehicles, since OEMs are in the best position to promote EV sales. However, regardless of who cont.
 receives the funding (OEMs or utilities), LCFS credit revenue generated by LD EVs should be used to promote the LD EV market.

We provided concrete recommendations that address this and other shortcomings in the regulations in our letter dated, August 27, 2024, which we incorporate in these comments by reference.

Again, we sincerely appreciate the hard work and collaboration by CARB staff on the proposed changes. Please don't hesitate to contact me if you have any questions or need additional information.

Sincerely,

SI M boy

Dan Bowerson Vice President, Energy & Environment <u>dbowerson@autosinnovate.org</u>

Here is the comment you selected to display.

Comment 235 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	JH2F
Last Name	Japan Hydrogen Forum
Email Address	Non-web submitted comment
Affiliation	
Subject	Submittal] Japan Hydrogen Forum (JH2F) _Comments on Proposed Low Carbon Fuel Standard 15-d

Comment

Comment received during 2nd 15-Day Comment Period. Comment submitted by Clerk on behalf of Commenter.

Ms. Rajinder Sahota, To whom it may concern

Japan Hydrogen Forum (JH2F) is pleased to submit the attached comments for consideration. 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. We would like to express our sincere gratitude for your staff's work on the development of the proposed rule and their commitment to improving the LCFS to achieve carbon neutrality by 2045 and reduce greenhouse gas emissions 85% below 1990 levels by 2045.

Please allow us to submit the Public Comments via email since we had technical difficulty to process the electronic submittal. Should you have any questions, please feel free to contact us at LAG@jetro.go.jp

Sincerely, Japan Hydrogen Forum (JH2F) (213)354-2438

Attachment	www.arb.ca.gov/lists/com-attach/57-lcfs2024-2nd15day-AmgFa1RnV2lKU1Mj.pdf
Original File Name	JH2F Proposed Low Carbon Fuel Standard Amendments_Octq16th - Japan Hydrogen Forum.pdf
Date and Time Comment Was Submitted	2024-10-18 12:34:40

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Comment 235 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	JH2F
Last Name	Japan Hydrogen Forum
Email Address	Non-web submitted comment
Affiliation	
Subject	Submittal] Japan Hydrogen Forum (JH2F) _Comments on Proposed Low Carbon Fuel Standard 15-d

Comment

Comment received during 2nd 15-Day Comment Period. Comment submitted by Clerk on behalf of Commenter.

Ms. Rajinder Sahota, To whom it may concern

Japan Hydrogen Forum (JH2F) is pleased to submit the attached comments for consideration. 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. We would like to express our sincere gratitude for your staff's work on the development of the proposed rule and their commitment to improving the LCFS to achieve carbon neutrality by 2045 and reduce greenhouse gas emissions 85% below 1990 levels by 2045.

Please allow us to submit the Public Comments via email since we had technical difficulty to process the electronic submittal. Should you have any questions, please feel free to contact us at LAG@jetro.go.jp

Sincerely, Japan Hydrogen Forum (JH2F) (213)354-2438

Attachment	www.arb.ca.gov/lists/com-attach/57-lcfs2024-2nd15day-AmgFa1RnV2lKU1Mj.pdf
Original File Name	JH2F Proposed Low Carbon Fuel Standard Amendments_Octq16th - Japan Hydrogen Forum.pdf
Date and Time Comment Was Submitted	2024-10-18 12:34:40

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Board Comments Home



October 15, 2024

Ms. Rajinder Sahota Deputy Executive Officer, Climate Change and Research California Air Resources Board 1001 | Street Sacramento, CA 95864

Re: LCFS 15-day Notice Comments

Japan Hydrogen Forum (JH2F) is an organization formed in 2021 to contribute to the goal of decarbonization in the United States. It consists of 32 Japan-affiliated companies with hydrogen related technologies spanning production, carrier conversion, transportation, storage, and utilization. This including hydrogen fuel cell providers for heavy-duty (HD) truck and cargo handling equipment OEMs, as well as retail hydrogen refueling station (HRS) providers in California.

235.1 JH2F is encouraged to see some of the proposed language, LMD HRI provisions. However, we still concern on the HD HRI provisions with the proposed cap structure and some delayed timeline to implement key provisions making credits supply/demand situation well balanced such as Auto 235.2 Acceleration Mechanism and Crop-based biofuel twenty percent cap implementation. Thus, we would like to submit the following comments for further consideration in response to the LCFS 15-day notice available on October 1, 2024. 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.

Fuels Subject to Regulation

We support staff's modified language on the limitation to use crop-based feedstocks used to produce biomass-based diesel, which had contributed a very volatile LCFS market. With that said, we continue to 235.3 express our view on the critical needs of LCFS market stabilization as soon as possible, by enacting this crop-based feedstock limitation at time of this amendments as originally proposed in the 1st 15 day comment package on August 12th, rather than waiting until 2028, which will impact the currently suffering low LCFS market situation.

We believe that stability of LCFS market is a fundamental market dynamic to attract infrastructure investment, and will play a critical role in early-stage infrastructure development such as hydrogen stations.

HRI – Light and Medium Duty(LMD-HRI)

235.4

Again, we appreciate your effort to incorporate some of the feedback made in the last comments and are in support of the proposed language on increasing HRI credit capacity. We support that the higher cap aligning with the existing LDV HRI program will further facilitate development of LMD hydrogen

777 S. Figueroa St., Suite 3750 | Los Angeles, CA 90017 | Japan Hydrogen Forum (JH2F) | USA - JETRO

1



cont. station network and will encourage further investment for this infrastructure. However, we still see the language includes amount of HRI with 1.5x to capital expenditure (CAPEX), which limits the ability to reduce the cost of hydrogen at pump as it limits the cash flow in total. As this HRI credit and resulting

235.5 cash flow are generated over operation rather than upfront support for CAPEX, we highly recommend that the HRI credit CAPEX limit be removed to achieve long-term cost reduction thus lower pump pricing.

We also request for previous grant approved stations that have not been built to be grandfathered in with the current HRI regulation of capacity maximum 1,200 and 15 years of crediting, considering these

235.6 with the current HRI regulation of capacity maximum 1,200 and 15 years of crediting, considering these projects had applied for Grants based on the previous economics and not the new proposed rule with a limit of 10 years and 1.5x CAPEX constraints.

HD HRI program

235.4

235.7

We appreciate staff working with the hydrogen station developers to craft the program for heavy-duty (HD) HRI. While we noticed LDV HRI program has improvements on proposed language, we urge the importance of HD HRI program to consider the following improvements. While the 50% cap on HRI program is intended to prohibit over-credit generation while incentivizing large capacity station, we strongly believe that a higher cap is needed in earlier market situation. As typical HD hydrogen station will be planned with attached demand to start with, higher cap % on HRI is needed to support this initial customer segment in order to provide cost-competitive hydrogen at the pump. We deeply concerned that initial HD market with low hydrogen demand and 50% cap will result in higher cost of hydrogen at pump, creating even slower interest in adopting hydrogen trucks in the market.

To avoid over-credit generation, yet to support early-stage low volume station economics, we support the idea of introducing a limited-term higher cap structure, such as [80]% instead of 50% for the initial [3] years or by specific date such as 20[28], which enables accelerated establishment of HD hydrogen station networks, and such structure will even attract further investments to create positive market cycle.

Also, similar to LMD HRI side, we still see the language includes amount of HRI with 1.5x to capital
 235.8 expenditure (CAPEX), which limits the ability to reduce the cost of hydrogen at pump as it limits the cash flow in total. Thus, we request Staff to reconsider this provision to be removed.

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,

Takashi Ogi Chairperson, Japan Hydrogen Forum



2



October 16, 2024

Chair Liane Randolph and Members of the Board California Air Resources Board 1001 I Street Sacramento, CA 95814

RE: Proposed Second 15-Day Changes to the LCFS

Dear Chair Randolph and Members of the Board,

Cargill appreciates the opportunity to provide comments on the California Air Resources Board's (CARB) proposed Second 15-Day Changes to the Proposed Amendments to the Low Carbon Fuel Standard (LCFS) Regulation (second 15-Day Package), and we thank the Board and staff for their consideration.

Cargill is a Minnesota-based global agribusiness company that has worked closely with small- and largescale growers since our founding 159 years ago. We partner with farmers, food companies, retailers, and fuel producers to make, process, and move food and fuel feedstocks around the world. Cargill businesses originate, process, and convert these feedstocks into renewable fuels including biodiesel and ethanol, while working closely with our farmer partners. Our work starts at the farm level, where we are undertaking comprehensive, large-scale efforts to <u>reduce emissions</u> across our global supply chains – working hand in hand with farmers to scale regenerative farming practices, protect and restore vital landscapes and empower producer communities.

Proposed 20% Cap on Soybean, Canola, and Sunflower Oils

Cargill does not support CARB's proposed 20% cap on soybean, canola, and sunflower oils. As detailed in our previous comments submitted in the first Proposed 15-Day Changes to Proposed Regulation Order¹ (first 15-Day Package), we believe North American agriculture still has an important role to play in the transition to cleaner energy and more sustainable food systems.

236.1 Crop-based feedstocks such as soybean oil and canola oil have potential through innovation and science to further reduce emissions at the farm gate. There is growing recognition, especially at the United States federal level through the United States Department of Agriculture, that certain practices and technologies allow growers to reduce GHG emissions and enhance the resilience of the soil used to feed and fuel our world. North American farmers continue to respond to the call for more sustainable food, fiber, and fuels while increasing productivity per acre. Through innovations in seed technology, crop rotations, tillage practices, and nutrient management, farmers are producing more from a single acre than ever before² while lowering on farm GHG emissions. CARB's cap intentionally limits the incentive to

¹ Cargill <u>comments</u> on first 15-Day Package, August 27, 2024

² United States Dept. of Agriculture, Soybeans: <u>Yield by Year, US</u>, as of October 11, 2024

the agricultural value chain, constraining the market's ability to solve for lower cost carbon reduction opportunities and signaling the lack of future incentives for development of additional feedstocks.

236.1 cont.

236.2

Crop-based feedstocks today possess a higher potential for decarbonization than waste feedstocks. Current regulatory programs account for the upstream emissions related to crop production but fail to recognize the full carbon sequestration benefits of sustainable practices and rotations. Crop-based feedstocks have the potential to become more sustainable over time, offering additional opportunities for carbon reductions, as recognition and adoption of these sustainable practices grow. Cargill believes these potential reductions are too impactful to not consider when evaluating the place of crop-based feedstocks in current and future renewable energy programs.

Current regulatory programs such as the US Renewable Fuel Standard and the Canada Clean Fuel Regulations (CFR) have approved aggregate compliance for crop-based feedstocks in North America, agreeing that these feedstocks meet land use restrictions for biofuels under both regulations. For this reason, we support the addition of the Canada CFR as an approved certification system as mentioned by staff in the Second Notice of Public Availability posted on October 1, 2024. Without science-based evidence demonstrating the need for a cap, the current ILUC penalty guardrails within the LCFS combined with recently proposed sustainability requirements for biomass are more than sufficient to mitigate the potential for land use change.

A durable regulatory program relies on a diversity of feedstocks, both domestic and imported. We ask staff to fully consider the unintended consequences of further disincentivizing domestic crop-based feedstocks in favor of a finite supply of waste oils, much of which will require importation from other regions in the world that may not have the same decarbonization goals, verification and compliance stringency, or certainty of supply that our domestic feedstocks currently have today. We urge both staff and Board members to utilize all mechanisms available to ensure that the purpose and implementation of this proposed cap are firmly based in science and the best available data, and that the implementation plan for the cap thoughtfully considers effective approaches to verification for all feedstocks, regardless of their origin.

Thank you for the opportunity to comment. Cargill looks forward to continued collaboration with CARB, and I can be reached directly by email at <u>william barksdale@cargill.com</u>.

Sincerely,

William A. Bah

William Barksdale Managing Director Cargill, Inc.

cc: Rajinder Sahota, Matthew Botill

October 16, 2024

RE: International Council on Clean Transportation comments on the Second Notice of 15-day changes to the Proposed Regulation Order

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 inuse 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 second notice of 15-day changes to the Low Carbon Fuel Standard amendments. We commend the agency for its technical analysis 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, restoring stable credit prices, and maintaining the environmental integrity of the program.

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 (<u>n.pavlenko@theicct.org</u>) and Dr. Stephanie Searle (<u>stephanie@theicct.org</u>).

Nikita Pavlenko ICCT Fuel Program Lead International Council on Clean Transportation

> www.theicct.org communications@theicct.org

> > @theicct



Summary of comments

CARB made additional changes to its proposed LCFS amendments in its second 15-day comment package. The largest changes include increased flexibility for fossil hydrogen producers to qualify for LCFS crediting until 2035, an additional 20 year lock-in of biomethane carbon intensity values for projects that break ground before 2030 regardless of whether binding methane regulations take effect, and a delay of the vegetable oil crediting restriction for all facilities, now with sunflower oil included. CARB also specified feedstock sustainability certification requirements for forestry biomass and adjusted the reporting period to determine whether the auto-acceleration mechanism (AAM) should be triggered.

We find that these changes will do little to address CARB's current aim to stabilize the credit market and, in some cases, may be counterproductive. Timely fixes are required to address upstream environmental risks associated with crop-based fuel production and inflated carbon intensity values for livestock manure derived biomethane that are compounded by book-and-claim crediting.

Biomass-based diesel crediting restriction is insufficient to address upstream risks

CARB now proposes to delay the proposed crediting restriction on vegetable oils until 2028 for all biomass-based diesel (BBD) facilities that are currently in operation. According to CARB quarterly reporting data, at least 19% of feedstock processed by certified BBD fuel producers in 2023 consisted of vegetable oils.¹ If we include renewable diesel that was designated as "Other" in our totals, this share increases to 32%. "Other" renewable diesel is likely sourced from canola oil which has the largest number of approved renewable diesel pathways in California of all non-specified feedstocks.²

Although both the current and previous 15-day proposals would do little to shift BBD capacity expansion trends,³ the loosening of the crediting restriction in the September package further weakens the efficacy of the proposed safeguards to prevent rapid expansion of crop-based BBD fuel. Crop-based fuel is associated with uncertain and significant upstream

¹ https://ww2.arb.ca.gov/resources/documents/low-carbon-fuel-standard-reporting-toolquarterly-summaries

² https://ww2.arb.ca.gov/resources/documents/lcfs-pathway-certified-carbon-intensities

³ https://www.arb.ca.gov/lists/com-attach/7554-lcfs2024-Bm8BZAZkAyQCWwBj.pdf

environmental risks including conversion of primary forestland and price volatility of food and feed commodities.⁴

As we have noted in our comments for the previous 15-day rulemaking,⁵ the 237.2 proposed crediting restriction on vegetable oils in the LCFS has significant cont. gaps that undermine its intent. The grandfathering provision alone could allow a significant increase in volumes of vegetable oil-derived biomassbased diesel beyond 2023 consumption levels until 2028, while the exclusion of SAF from the crediting restriction effectively creates a loophole for vegetable oils entirely. Given these major issues, further delaying and weakening the proposed safeguard is not justified. We reiterate that a more effective and enduring safeguard would be a volume or energy-based cap on the quantity of virgin vegetable oils or ideally, lipid-based fuels in the LCFS, set at 2023 levels. A combined lipids cap would set a much stronger signal than the 20%, per-facility limitation, which still allows for significant growth in vegetable oil and does not address the use of other lipid-based feedstocks. This approach would incentive additional waste oil imports from international markets that poses fraud risks, a major issue currently being investigated by EPA⁶ as well as criticized by the domestic biofuel industry.⁷

If a volume or energy-based cap is not feasible in the short-term, we recommend that CARB reassess the indirect land use change (ILUC) values for all feedstocks listed in Table 6 including additional feedstocks if deemed appropriate by an expert working group in its next rulemaking. Performing an updated ILUC assessment would offer several advantages to the existing proposal as it could both be readily implemented within the program's existing framework and act as a buffer for global land-use emissions that are not well accounted for in current models.

ICCT and others including a team of trade economists from Yale University that participated in CARB's 2015 ILUC workgroup have commented on the shortcomings of the 2015 GTAP-BIO model that was used to develop values in Table 6 of the regulation. These include the model's representation of afforestation rates and misapplication of correlational behavior across different geographic regions.⁸ EPA assessed the structure of five ILUC models and their sensitivity to input parameters in a modeling exercise published last year and found significant variation across modeling results,

⁴ https://theicct.org/wp-content/uploads/2022/08/lipids-cap-ca-lcfs-aug22.pdf

⁵ https://www.arb.ca.gov/lists/com-attach/6886-lcfs2024-AmsCZwFjACcAWQJu.pdf

⁶ https://farmpolicynews.illinois.edu/2024/08/epa-investigating-used-cooking-oil-importauthenticity/

⁷ https://www.usnews.com/news/us/articles/2024-06-27/us-lawmakers-seek-crackdown-onchinese-used-cooking-oil-imports-over-fraud-concerns

⁸ https://www.arb.ca.gov/lists/com-attach/6987-lcfs2024-AXVUPQNgUWsDa1AP.pdf

237.4 cont. particularly for soybean oil due to its fungibility with other vegetable oils in different markets.⁹ CORSIA experts have similarly found significant variation in results between its two ILUC models, particularly for oilseed crops that have the highest ILUC risk.¹⁰

If a crediting restriction is retained in the adopted amendments, it is critical that any BBD that exceeds the 20% vegetable oil volume limit is assigned the carbon intensity (CI) of fossil diesel rather than the annual CI benchmark. As explained in our previous comments, we also recommend that a crediting restriction be extended to fuel consumed in the aviation sector to avoid feedstock diversion in new applications that remains exempt from the proposed safeguard.¹¹

Under the current proposal, excess BBD would only incur program deficits between 2028 and 2033 if and when the LCFS benchmark falls below the average CI of crop-based BBD. If the auto-acceleration mechanism (AAM) is triggered at least two times and the annual benchmark falls below the CI of crop-based before 2028, the crediting restriction would effectively be moot. We illustrate this behavior under the proposed CI trajectory and proposed CI trajectory with an AAM triggered in 2026 and 2028 in Figure 1 below. We assume a constant LCFS credit price of \$100 per tonne CO₂e and average BBD CI of 60 gCO₂e/MJ.



Figure 1. Left: Vegetable oil BBD crediting under August proposal. Right: Vegetable oil BBD crediting under August proposal with AAM triggered in 2026 and 2028

⁹ https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P1017P9B.pdf

¹⁰ https://www.icao.int/environmental-

protection/CORSIA/Documents/CORSIA_Eligible_Fuels/CORSIA_Supporting_Document_CORSIA% 20Eligible%20Fuels_LCA_Methodology_V5.pdf

¹¹ https://www.arb.ca.gov/lists/com-attach/7554-lcfs2024-Bm8BZAZkAyQCWwBj.pdf

The *de facto* penalty for exceeding the crediting limit ranges from approximately \$0.06 to \$0.23 per diesel-gallon equivalent (DGE) depending on the year, before going away entirely. If these fuels were treated as having a CI of the fossil baseline, their effective penalty would \$0.55 per DGE, creating a stronger disincentive for exceeding the limit. In short, this small penalty is not expected to meaningfully change producer behavior given that it is far lower than the sum of incentives renewable diesel sold in California receives. We estimate this total incentive to be \$2.33 per gallon of soybean oil-based BBD including LCFS credits, federal RINs, 45Z tax credits, and avoided cap-and-trade penalties.¹²

Biomethane crediting proposal will contribute to credit market oversupply

Changes made in the second 15-day package now propose that the certified carbon intensity of biomethane projects that break ground before 2030 are eligible for up to two additional crediting periods (equivalent to 20 years) regardless of whether binding methane capture regulations take effect. The Notice of Public Availability document indicates that this leniency was granted to assist farmers in complying with California's Short-Lived Climate Pollutant (SLCP) reduction strategy.¹³ We recognize that anaerobic digesters are a strategy to meet statewide methane reduction targets; however, locking in crediting incentives despite regulatory capture requirements is a departure from sound life-cycle assessment methodology and misapplies policy incentives designed for transportation fuels to the agricultural sector.

On their own, extended timelines for biomethane crediting will not help stabilize the LCFS credit market and address the current oversupply of credits in the market. Historical trends indicate that lenient compliance mechanisms for biomethane will lead to continuous excess crediting and a triggering of the AAM and compliance trajectory step-downs. As stated in previous comments, we recommend that biomethane remain subject to more stringent sourcing requirements consistent with other pathways and to remove avoided methane emissions crediting that does not pass an additionality test.¹⁴ Biomethane and derivative fuels can remain a viable LCFS compliance pathway, without a reliance on out-of-state and out-ofsector emissions offsets and use of inflated carbon intensity factors. We provide evidence to support these arguments below.

237.5 cont.

¹² https://www.arb.ca.gov/lists/com-attach/7554-lcfs2024-Bm8BZAZkAyQCWwBj.pdf

¹³ https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/2nd_15day_notice.pdf

¹⁴https://www.arb.ca.gov/lists/com-attach/7554-lcfs2024-Bm8BZAZkAyQCWwBj.pdf.

Biomethane crediting proposal is a departure from sound life-cycle assessment methodology

Manure-derived biomethane is the most lucrative fuel of all LCFS pathways on a \$ per MJ basis due to the use of avoided methane crediting within Tier 1 and 2 calculators. When biomethane is processed into hydrogen or converted into electricity to power electric vehicles its economic value is even higher, further benefitting from energy economy ratios (EERs) that correct for the higher efficiency of battery and fuel cell powertrains. Organic waste processed at landfills similarly benefits from avoided methane crediting, although to a lesser degree.

We illustrate the expected credit value of common heavy-duty fuel pathways consumed in 2025. We compare the incentive value granted to dairy biomethane-derived renewable natural gas (RNG), electricity and hydrogen relative to renewable diesel (RD) and green hydrogen in Figure 2. Our calculations assume the average CI by pathway of currently certified facilities in the LCFS certified pathways spreadsheet and an LCFS credit price of \$100/mt.¹⁵



Figure 2. Average LCFS credit value for common heavy-duty fuel pathways in 2025

Manure-derived biomethane pathways receive more than seven times the LCFS credit value as green hydrogen sourced from zero-CI electricity and up to 50 times the credit value of renewable diesel. This is due to highly negative carbon intensity values for certified manure-based fuel pathways; for example, the average CI for manure-derived electricity sold in the California transport sector is -643 gCO₂e/MJ.

¹⁵ https://ww2.arb.ca.gov/resources/documents/lcfs-pathway-certified-carbon-intensities

The emissions benefits of manure-derived biomethane are highly subjective and likely overstated due to the assumption that manure is vented to the atmosphere in absence of LCFS policy. Often, baseline operating conditions at livestock farms do not pass an additionality test nor are they required to under the program. We previously commented on the Yellow Jacket farm pathway application that receives avoided methane credits despite the farm previously operating an electricity generator to convert biogas into electricity sold to the local distribution grid.¹⁶ In absence of a policy adjustment that more accurately reflects whether consuming biomethane as a transport fuel delivers avoided emissions, digester projects will continue to be overcredited for the quantity of emissions reductions they deliver. If avoided methane credits are instead removed from Tier 1 calculations, we estimate that the average CI of dairy-derived RNG raises to 36.4 gCO2e/MJ.¹⁷ This corresponds to a credit value of \$0.62 per diesel gallon equivalent (DGE) in 2025 that is comparable to the current credit value for waste-based RD (Figure 2).

Environmental justice groups have emphasized the adverse impacts of this accounting practice including a 2021 petition that called on CARB to remove dairy and swine manure eligibility from the LCFS.¹⁸ In the petition, the groups also identified the state's obligation to accurately assess localized pollution impacts associated with alternative fuels and existence of numerous other public funding streams that benefit farmers for installing digester operations such as the Dairy Digester Research & Development Program (DDRDP). Subsequent comments from ICCT and others have underscored the need to update the carbon intensity of biomethane-derived fuel in Tier 1 and 2 emission calculators to "right size" its contribution towards state-wide emission reductions.¹⁹

Installing anaerobic digesters at livestock farms is one strategy to comply with the state's SLCP reduction strategy that sets a 40% methane emissions reduction target by 2030 alongside other organic waste diversion requirements.²⁰ Compared to alternative manure management strategies, digesters are costly to build and have higher methane production rates than

237.7 cont.

237.9

¹⁶ https://www.arb.ca.gov/lists/com-attach/980-tier2lcfspathways-ws-Vj8GY1c1ACcLUlc0.pdf

¹⁷ https://theicct.org/wp-content/uploads/2023/05/california-rng-outlook-2030-may23.pdf

¹⁸ Lazenby, Ruthie, Phoebe Seaton, Tarah Heinzen, Tyler Lobdell, Brent Newell, Tom Frantz, Cristina Stella, and Christine Ball-Blakely. "Petition for Rulemaking to Exclude All Fuels Derived from Biomethane from Dairy and Swine Manure from the Low Carbon Fuel Standard Program," October 27, 2021. https://food.publicjustice.net/wp-content/uploads/sites/3/2021/10/Factory-Farm-Gas-Petition-FINAL.pdf.

¹⁹ https://www.arb.ca.gov/lists/com-attach/6955-lcfs2024-Wi8CZ1MhUFwHYgFu.pdf; https://www.arb.ca.gov/lists/com-attach/6886-lcfs2024-AmsCZwFjACcAWQJu.pdf; https://www.arb.ca.gov/lists/com-attach/7077-lcfs2024-Wz4BZgd0BCNVOwJo.pdf
²⁰ https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201520160SB1383

practices that utilize solid treatment.²¹ We compare the average methane emissions per livestock head by management type in 2022 using data from the California GHG emissions inventory and U.S. Census in Figure 3.²²



Figure 3. Methane emissions per manure management strategy for California dairy cattle in 2022

Rather than subsidizing anaerobic digesters via transportation fuel credit incentives, CARB and partner agencies can pursue methane reduction strategies that operate independent of the LCFS program to meet SLCP targets. These strategies include incentivizing farmers to implement 237.10 alternative cattle diets to reduce enteric methane emissions, mandating methane flaring, and providing financial support to the California Department of Food and Agriculture's Alternative Manure Management Program (AAMP).²³ Though alternative manure strategies such as solid storage and daily spread may not be feasible to implement at all farms, solid management emits the lowest quantity of methane per dairy cattle head.

CARB's proposal to lock-in avoided methane crediting for 20 years beyond the end of the crediting period in which binding methane regulations take 237.11 effect does not appear to support the implementation of alternative manure management strategies as an SLCP reduction strategy. It instead exacerbates existing problems with LCA accounting at livestock digesters with contested localized environmental benefits.

237.9 cont.

²¹ 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. ²² https://ww2.arb.ca.gov/sites/default/files/ghg-inventory-

doc/docs2024/docs3/3a2ai_manuremanagement_anaerobicdigester_livestockpopulation_dairyc ows ch4 2022.htm

²³ https://www.cdfa.ca.gov/oefi/AMMP/

Crediting practices for bio-hydrogen may already be crowding out investment in alternative technology pathways

The impacts of overstated emissions from locked-in avoided methane credits are compounded by the practice of book-and-claim crediting. Today, approximately 70% biomethane credited under the LCFS comes from livestock farms located out of state that do not have to adhere to a traceability or deliverability requirement.²⁴ Further, according to LCFS pathways data, all certified bio-hydrogen projects source methane inputs from out-of-state farms.²⁵ We present the locations of dairy digesters that indirectly supply in-state hydrogen projects as of early 2024 in Figure 4.



Figure 4. Number of projects and geographic source of dairy biomethane for certified hydrogen pathways in California

This trend is only expected to grow as ongoing book-and-claim crediting attracts out-of-state applicants. In the previous 15-day package, CARB proposed that deliverability requirements take effect in 2041 for biomethane-derived RNG and 2046 for biomethane-derived hydrogen consumed as a process input at refineries or in a fuel cell vehicle. The second package introduced a modification that if the number of registered Class 3-8 zero-emission vehicles exceeds a threshold of 132,000 vehicles by the end of 2029, deliverability requirements are pushed up to 2038 for RNG pathways and remain the same for biomethane-derived hydrogen. CARB's proposal to delay action for the next 15 years fails to address the misapplication of program revenue to heavily subsidize changes to manure

²⁴ https://theicct.org/wp-content/uploads/2023/05/california-rng-outlook-2030-may23.pdf

²⁵ https://ww2.arb.ca.gov/resources/documents/lcfs-pathway-certified-carbon-intensities

237.12 cont. management in out-of-state farms rather than support in-state transportation decarbonization.

Importantly, the continuation of book-and-claim crediting to offset fossil fuel consumption can crowd out investment for alternative technologies. Nearly all of fossil natural gas consumed in the California transport sector has been replaced by an equivalent volume of RNG, so biomethane producers have looked toward alternative fuel markets such as hydrogen.²⁶

Dairy manure can receive up to \$8.8/kg H₂ in LCFS credits, nearly three times the quantity of the federal hydrogen tax credit (45V) for hydrogen that has a certified CI between 0 and 0.45 kg CO₂e/kg H₂.²⁷ Fossil and blue hydrogen producers that source biomethane as an input feedstock do not have to adhere to more rigorous sourcing requirements that apply to electrolytic hydrogen that require electricity producers to be located within the Western Interconnection system. This sourcing flexibility may already be crowding out room for development of electrolytic "green" hydrogen produced from gridsupplied electricity running counter to CARB's recognition that it will take time for non-fossil hydrogen to scale up.²⁸

We calculate that a fossil SMR plant sourcing dairy manure biomethane offsite pays approximately \$47.9 per MMBTU of biomethane based on the citygate natural gas sale price in California and average value of LCFS credits for manure RNG.²⁹ This corresponds to \$5.03 per kg H₂, assuming a hydrogen conversion efficiency of 0.42 kg per kg of biomethane. When combined with the conventional SMR hydrogen production cost of \$0.3 per kg H₂, we calculate fossil SMR plants that purchase RNG produced offsite have a levelized production cost of \$5.33 per kg H₂.³⁰ In comparison, we estimate the average cost of electrolytic hydrogen produced from grid-connected electricity in California in 2025 to be \$9.06 per kg H₂. This includes the levelized cost of electrolysis over a 30 year project lifetime and renewable electricity sale price. We present this comparison in Figure 5.

²⁶ https://ww2.arb.ca.gov/resources/documents/low-carbon-fuel-standard-reporting-tool-quarterly-summaries

²⁷ https://www.congress.gov/117/plaws/publ169/PLAW-117publ169.pdf

²⁸ https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/2nd_15day_notice.pdf

²⁹ https://www.eia.gov/dnav/ng/hist/n3050ca3m.htm

³⁰ https://netl.doe.gov/research/carbon-management/energy-

systems/gasification/gasifipedia/technologies-hydrogen/with-carbon



Figure 5. Fossil SMR and electrolytic hydrogen production cost comparison in California

As demonstrated in Figure 5, electrolytic hydrogen currently operates at a \$3.96 price premium relative to fossil SMR producers that offset fossil natural gas with manure biomethane purchased offsite. Though the costs of electrolysis are expected to decline in the future, this rate will not keep pace with high-value manure biomethane that remains exempt from a deliverability requirement through at least 2046. As stated in previous comments, we recommend that deliverability be put in place before 2030 to prioritize in-state and in-sector emissions reductions and that projects that fail to pass a legal or financial additionality test do not receive avoided methane crediting.

Here is the comment you selected to display.

Comment 238 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Robert
Last Name	Cleeland
Email Address	Non-web submitted comment
Affiliation	
Subject	Proposed Low Carbon Fuel Amendment

Comment	Comment received during 2nd 15-Day Comment Period.
	Comment submitted by Clerk on behalf of Commenter.
238.1	"I'm writing to request that your upcoming vote regarding Low
	Carbon Fuel Amendments be delayed, or shelved entirely. There
	needs to be a full public review and disclosure of the updated
	pricing impact, resulting from this regulation. Californians
	already pay the highest fuel costs in the country, with taxes &
	regulations driving the cost up substantially. The cost of fuel
	impacts everything we consume, in addition to the cost of our own
238.2	transportation needs. There is only so much the consumer can bear,
	and actions like this proposed amendment directly adds to the
	everyday cost of every household and individual in the state. Thes
	actions only tend to add to the out of state migration of
	financially able residents, as well as those who can simply no
	longer afford the California financial burden."
	Thank vou - Robert Cleeland

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-18 12:34:40

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Board Comments Home



October 16, 2024

Chair Liane Randolph & Members of the Board California Air Resources Board 1001 I Street Sacramento, CA 95814

Via electronic submission

Re: Second 15-Day Changes to the Proposed Regulation Order

Dear Chair Randolph and Members of the California Air Resources Board:

The Nebraska Soybean Association appreciates the opportunity to comment on the proposed modifications (Second 15-Day Changes) to the Low Carbon Fuel Standard (LCFS) program. ASA has welcomed engagement with the California Air Resources Board (CARB) and staff throughout this multi-year process to update the LCFS program.

The Nebraska Soybean Association serves as an organization that represents Nebraska soybean growers assuring sound policy and regulatory decisions are made that impact soybean growers. The Nebraska Soybean Association represents soybean producers in our state that produced 267 million bushels of soybeans in 2023. Nebraska is a state where roughly 33 percent of the acres are irrigated.

CARB's Second 15-Day Changes to revise the LCFS did not address our major concerns with 239.1 provisions included in the August 15-day notice nor did it provide additional clarification or detail 239.2 related to sustainability reporting requirements for agricultural feedstocks. We do appreciate the additional flexibility related to virgin vegetable oil feedstock limitations, by extending the 239.3 compliance deadline to January 1, 2028, for all approved pathways at the date of adoption. However, additional feedstock limitations included in the Second 15-Day Changes document 239.4 could further limit soybean oil market share in California, when compared to the August proposal. In addition to the new proposals in the Second 15-Day Changes package, Nebraska Soybean 239.5 Association remains deeply concerned with the drastic pivot CARB has made in the past few months related to agricultural feedstocks used for biofuels. We continue to encourage that updates to the LCFS program are based on science, as required by AB-32.

Amended Feedstock Cap Considerations

239.6 Nebraska Soybean Association has significant concerns with the virgin vegetable oil feedstock cap that was included in the initial 15-Day Changes posted in August, especially after CARB itself noted that a cap will increase the utilization of petroleum diesel. The current proposal limits, or

239.6 cont.	caps, the amount of soybean oil that is allowed to generate credits in the program at an arbitrary 20%. Now, CARB is expanding on this cap in its Second 15-Day Changes with the inclusion of sunflower oil. Adding additional feedstocks to the 20% aggregate cap will further limit market access for soybean oil and additional gallons of low-carbon fuels.
239.7	Based on CARB's own analysis, a cap on credit generation for vegetable oil feedstocks will lead to an increase in fossil diesel use compared to the status quo. While Nebraska Soybean Association agrees that all feedstocks entering the California LCFS market should maintain fidelity to the assumptions underlying their life-cycle assessment (LCA), domestic agricultural feedstocks are facing a redundant, triple penalty through an outdated indirect land use change (ILUC) score, stringent sustainability reporting requirements, and a proposed arbitrary cap on credit generation while all other feedstocks, including imports, do not face the same restrictions.
239.8	The proposed cap increases soy's carbon intensity (CI) score for amounts over the cap from the established pathway, which is based on science, to the benchmark CI, which is not based on an LCA for soy. This is effectively increasing soy's ILUC score by upwards of 50% for many pathways without a scientific basis. In fact, CARB has refused to use new data related to ILUC while at the same time effectively increasing it by an arbitrary amount.
239.9	The increase in ILUC for ag feedstocks above the 20% threshold will effectively shut them out of the LCFS. Biomass-based diesel provides GHG and emissions benefits that are unpriced by the market. As a result, they cost more to produce than they can be sold for and rely on policy to account for these benefits. Without the credit generation, soy will not be able to compete against waste feedstock imports, thereby capping use in the LCFS.
239.10	North American agricultural feedstocks for biofuel production are already held to a high standard for participation in the Renewable Fuel Standard (RFS) and the Canadian Clean Fuels Regulations. Rather than adding additional sustainable North American feedstocks to its arbitrary
239.11	proposed cap, CARB should consider updating carbon intensity analysis and oversight of imported feedstocks, which are not held to the same level of accountability.
239.12	While the Nebraska Soybean Association is steadfast in its opposition to the virgin vegetable oil feedstock cap and the rationale used to reach this conclusion, the Second 15-Day Changes added some additional flexibility to come into compliance with the arbitrary cap. We appreciate CARB's acknowledgement that biofuel production facilities cannot shift production overnight, and thank CARB for updating the grandfathering clause to provide a 2028 compliance date for all approved pathways in the LCFS program.
	Carbon Intensity Scoring and Auto Acceleration Mechanism
239.13	The Nebraska Soybean Association remains concerned that without a comprehensive update to the Global Trade Analysis Project model for biofuels (GTAP-BIO) that CARB utilizes, soy-based feedstocks will be phased out of the LCFS even without the additional limitations being proposed

in the Second 15-Day Changes. Current data indicates a much lower CI score for soybeans, as growers continue to improve soil practices, limit water use, lower on-farm emissions and more.

2

On the one hand, CARB is recommending stringent sustainability guardrails for U.S. soy, but on the other hand is still on track to likely phase-out soy-based biofuels from credit generation by approximately 2035 or sooner.

239.13 cont.

> As CARB looks to develop a more aggressive auto acceleration mechanism to reach CI reduction benchmarks sooner, using outdated methodologies will only limit the output of actual improvement over time in terms of emissions reductions. As CARB updates all other major lifecycle emissions models through this rulemaking, we once again urge action to update the GTAP-BIO model so that the most current, science-based data may be used to determine carbon intensity reductions.

In terms of updating the timeline for analysis of data to trigger the auto acceleration mechanism,
 the Nebraska Soybean Association appreciates that CARB is seeking to provide additional notice to the market before a trigger is implemented through the ability to analyze data quarter over quarter rather than just annually. This will allow the industry more time to plan and make business decisions ahead of new benchmarks triggering.

Sustainability Guardrails and Traceability Concerns

239.15 The Nebraska Soybean Association remains very concerned about the sustainability guardrails. The sustainability guardrails are more onerous than the specified source requirements used for waste feedstock imports. Palm oil in Southeast Asia has had forced labor concerns¹, but CARB does not require used cooking oil derived from palm to track social or economic sustainability. Concerningly, petroleum also does not have to track these criteria. CARB's proposal makes it administratively easier to use non-sustainable petroleum² in the state than biofuels that have lower CI scores and are produced from sustainable feedstocks grown in the United States. Land use change is already captured in the ILUC score, which makes it unclear what purpose the guardrails serve.

The Second 15-Day Changes offered a bit more detail about how CARB plans to implement its reporting and requirements in terms of traceability, but we continue to have serious concerns about how this proposal will work in practice. By way of background, soybean products pass through many hands before final use. A soybean is produced, potentially transported to a grain elevator, then must reach a soybean processor to be separated into soybean oil and soybean meal (crushed). The meal and oil can then be delivered to end users. Because of this, ensuring the identity preservation of a soybean is not easily accomplished. Soybeans are a bulk commodity, and infrastructure in the U.S. was not developed to segregate subunits of the crop. This bulk handling system based on comingling is one of the inherent advantages the United States has as it reduces transportation costs, and subsequently on-ground emissions.

239.18 CARB's proposal states that farmers will have to declare the geographical shapefiles or coordinates of farm boundaries starting in 2026. This raises many issues including the definition

¹ https://apnews.com/article/virus-outbreak-only-on-ap-indonesia-financial-markets-malaysia-7b634596270cc6aa7578a062a30423bb

² https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2022.858512/full

of a farm and how grain must be traced and reported if harvested from several fields but comingled at storage. While the deforestation requirements do not start until 2028, the questions posed above are relevant for the attestations starting in 2026. At that point, farmers will have to declare the boundaries of their farm. CARB settling on one definition for 2026 and another for 2028 would create much confusion. Educational efforts will be needed ahead of 2026. Once farmers understand the program, it will be very difficult to change fundamental definitions.

239.18 cont.

While 2026 may seem like plenty of time, it is much less for farmers in practice. Soybeans available starting at the beginning of 2026 are from the crop harvested in the fall of 2025 and planted in the spring of 2025. Farmers are purchasing inputs for that crop currently. If delivery points for the next soybean crop require data disclosure, producers need to know that now as they plan out their upcoming crops and lock in investments. So, if new LCFS regulations are not finalized until January 2025 and planting begins in March 2025, it leaves virtually no planning time for a farmer to update practices to adhere to these new attestation requirements.

239.19

cont.

If CARB insists on agricultural feedstock traceability, then it should reward sustainable practices beyond what is already assumed in the LCA. For instance, some soybeans are double cropped meaning they are grown as a secondary crop following a primary crop within a growing season. They are not displacing other crops or land uses. Double-crop soybeans should be eligible to have the ILUC component of the CI score removed, or at least shared with the other crop in the rotation.

Entities Eligible to Apply for Fuel Pathways

The Nebraska Soybean Association is concerned about CARB's proposal to give the Executive Officer the discretion to stop accepting new pathways for biomass-based diesel starting in 2031.
 We do not understand how this benefits the LCFS. Under AB-32, CARB must under statute minimize costs and maximize GHG reductions. It is unclear how this is served by rejecting new pathways. In fact, the LCFS is best served by allowing the most available pathways. If these pathways cannot achieve cost-effective GHG savings, they will not be utilized by the market in the LCFS. In essence, an increase in pathways can only serve to improve GHG benefits in California. Singling out a single fuel for prejudicial treatment is baffling given the goals of the LCFS and the authority that establishes it.

Recommendations to CARB

239.21 As CARB finalizes its update to the LCFS, the Nebraska Soybean Association aligns itself with the American Soybean Association (ASA) recommendations that will likely prevent an increase in fossil diesel use, improve carbon intensity calculations, and improve market access for sustainable agricultural feedstock providers.

First, CARB should not apply the vegetable oil feedstock cap proposal to North American
 feedstocks. As noted above, these feedstocks are already subject to guardrails to ensure
 production on land that has not been converted since 2008. The RFS was designed specifically to
239.22 prevent land conversion for biofuel production, and U.S. Department of Agriculture (USDA) data
 cont. shows a decrease in farmland over the same period.

239.23 Second, CARB should convene an expert working group to consider issues related to the sustainability provisions and indirect land use change. CARB has utilized working groups in the past to analyze complex issues related to the LCFS and this is no different. Through meetings with CARB staff and board members, decisions are being made using competing schools of thought. Gathering experts to coalesce around an agreed upon science-based approach moving forward would ensure that CARB is utilizing the best information available. We recommend that this expert working group convenes in 2025 and provide recommendations by October 2026.

Lastly, CARB must undertake a comprehensive update of the GTAP-BIO model for soybean oil
 used in biofuel production. Without using the most up-to-date and accurate data, CARB is doing a disservice to the feedstock producers and California's citizens by calculating carbon intensity
 scores not rooted in current fact. Through CARB's own analysis we know that basing decisions off old data will lead to more—not less—emissions in the California transportation sector.

Conclusion

- 239.25 The Nebraska Soybean Association is encouraged by the continued successes of programs that support the development of cleaner, low-carbon fuels. However, it is critical that CARB finalizes updates in a way that does not arbitrarily exclude agricultural feedstocks through policies that are not science-based and run afoul of CARB's mandate, including capping vegetable oil feedstocks
- and applying onerous sustainability guardrails that add cost without rewarding farming practices that lower CI.
- 239.27 CARB's Second 15-Day Changes did not address any of the fundamental issues raised by soybean farmers in the first 15-Day Changes and fails to acknowledge the potential unintentional consequences of a feedstock outlined by its own employees only a few months before. CARB is required under the law to achieve the maximum technically feasible and cost-effective
 239.29 reductions in GHGs. The two most recent 15-Day Changes show a lack of willingness to achieve the statutory obligations set forth in AB-32.

The Nebraska Soybean Association is eager to continue working with CARB to support the role of agriculture in diversifying the fuel supply while reducing GHGs and increasing clean air 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, Kent Broddueste

Kent Grotelueschen, President Nebraska Soybean Association



MOSOY.ORG

October 16, 2024

Chair Liane Randolph & Members of the Board California Air Resources Board 1001 I Street Sacramento, CA 95814

Via electronic submission

Re: Second 15-Day Changes to the Proposed Regulation Order

Dear Chair Randolph and Members of the California Air Resources Board:

The Missouri Soybean Association (MSA) appreciates the opportunity to comment on the proposed modifications to the Low Carbon Fuel Standard (LCFS) program. We have always welcomed engagement with the California Air Resources Board (CARB) and staff throughout this multi-year process to update the LCFS program.

MSA was founded in 1966 as a not-for-profit, representing Missouri's soybean farmers. MSA serves as the voice for soybean farmers and all who are part of the soybean value chain. Guided by our farmer-elected board of directors, MSA works to protect farmers' freedom to operate and increase family farmers' profitability.

240.1 CARB's Second 15-Day Changes to revise the LCFS did not address our major concerns with provisions included in the August 15-day notice, nor did it provide additional clarification or detail related to sustainability reporting requirements for agricultural feedstocks. We do appreciate the additional flexibility related to virgin vegetable oil feedstock limitations, by extending the compliance deadline to January 1, 2028, for all approved pathways at the date of adoption. However, additional feedstock limitations included in the Second 15-Day Changes
240.4 document could further limit soybean oil market share in California, when compared to the August proposal.

In addition to the new proposals in the Second 15-Day Changes package, MSA remains deeply
 concerned with the drastic pivot CARB has made in the past few months related to agricultural feedstocks used for biofuels. We continue to encourage that updates to the LCFS program are based on science, as required by AB-32.

Amended Feedstock Cap Considerations

240.6 MSA has significant concerns with the virgin vegetable oil feedstock cap that was included in the initial 15-Day Changes posted in August, especially after CARB itself noted that a cap will increase the utilization of petroleum diesel. The current proposal limits, or caps, the amount of soybean oil that is allowed to generate credits in the program at an arbitrary 20%. Now, CARB is expanding on this cap in its Second 15-Day Changes with the inclusion of sunflower oil. Adding

240.6 cont.	additional feedstocks to the 20% aggregate cap will further limit market access for soybean oil and additional gallons of low-carbon fuels.
240.7	Based on CARB's own analysis, a cap on credit generation for vegetable oil feedstocks will lead to an increase in fossil diesel use compared to the status quo. While MSA agrees that all feedstocks entering the California LCFS market should maintain fidelity to the assumptions underlying their life-cycle assessment (LCA), domestic agricultural feedstocks are facing a redundant, triple penalty through an outdated indirect land use change (ILUC) score, stringent sustainability reporting requirements, and a proposed arbitrary cap on credit generation while all other feedstocks, including imports, do not face the same restrictions.
240.8	The proposed cap increases soy's carbon intensity (CI) score for amounts over the cap from the established pathway, which is based on science, to the benchmark CI, which is not based on an LCA for soy. This is effectively increasing soy's ILUC score by upwards of 50% for many pathways without a scientific basis. In fact, CARB has refused to use new data related to ILUC while at the same time effectively increasing it by an arbitrary amount.
240.9	The increase in ILUC for ag feedstocks above the 20% threshold will effectively shut them out of the LCFS. Biomass-based diesel provides GHG and emissions benefits that are unpriced by the market. As a result, they cost more to produce than they can be sold for and rely on policy to account for these benefits. Without the credit generation, soy will not be able to compete against waste feedstock imports, thereby capping use in the LCFS.
240.10	North American agricultural feedstocks for biofuel production are already held to a high standard for participation in the Renewable Fuel Standard (RFS) and the Canadian Clean Fuels
240.11	Regulations. Rather than adding additional sustainable North American feedstocks to its arbitrary proposed cap, CARB should consider updating carbon intensity analysis and oversight of imported feedstocks, which are not held to the same level of accountability.
240.12	While MSA is steadfast in its opposition to the virgin vegetable oil feedstock cap and the rationale used to reach this conclusion, the Second 15-Day Changes added some additional flexibility to come into compliance with the arbitrary cap. We appreciate CARB's

acknowledgement that biofuel production facilities cannot shift production overnight, and thank CARB for updating the grandfathering clause to provide a 2028 compliance date for all approved pathways in the LCFS program.

Carbon Intensity Scoring and Auto Acceleration Mechanism

MSA remains concerned that without a comprehensive update to the Global Trade Analysis Project model for biofuels (GTAP-BIO) that CARB utilizes, soy-based feedstocks will be phased out of the LCFS even without the additional limitations being proposed in the Second 15-Day Changes. Current data indicates a much lower CI score for soybeans, as growers continue to improve soil practices, limit water use, lower on-farm emissions and more. On the one hand, CARB is recommending stringent sustainability guardrails for U.S. soy, but on the other hand is still on track to likely phase-out soy-based biofuels from credit generation by approximately 2035 or sooner. As CARB looks to develop a more aggressive auto acceleration mechanism to reach CI reduction benchmarks sooner, using outdated methodologies will only limit the output of actual improvement over time in terms of emissions reductions. As CARB updates all other major lifecycle emissions models through this rulemaking, we once again urge action to update the GTAP-BIO model so that the most current, science-based data may be used to determine carbon intensity reductions.

In terms of updating the timeline for analysis of data to trigger the auto acceleration mechanism,
 MSA appreciates that CARB is seeking to provide additional notice to the market before a trigger is implemented through the ability to analyze data quarter over quarter rather than just annually. This will allow the industry more time to plan and make business decisions ahead of new benchmarks triggering.

Sustainability Guardrails and Traceability Concerns

240.17

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² https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2022.858512/full

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240.18 cont.

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Entities Eligible to Apply for Fuel Pathways

MSA is concerned about CARB's proposal to give the Executive Officer the discretion to stop accepting new pathways for biomass-based diesel starting in 2031. We do not understand how this benefits the LCFS. Under AB-32, CARB must under statute minimize costs and maximize GHG reductions. It is unclear how this is served by rejecting new pathways. In fact, the LCFS is best served by allowing the most available pathways. If these pathways cannot achieve cost-effective GHG savings, they will not be utilized by the market in the LCFS. In essence, an increase in pathways can only serve to improve GHG benefits in California. Singling out a single fuel for prejudicial treatment is baffling given the goals of the LCFS and the authority that establishes it.

Recommendations to CARB

As CARB finalizes its update to the LCFS, MSA aligns itself with the American Soybean
 Association's (ASA) recommendations that will likely prevent an increase in fossil diesel use, improve carbon intensity calculations, and improve market access for sustainable agricultural feedstock providers.

240.22
 First, CARB should not apply the vegetable oil feedstock cap proposal to North American feedstocks. As noted above, these feedstocks are already subject to guardrails to ensure production on land that has not been converted since 2008. The RFS was designed specifically to prevent land conversion for biofuel production, and U.S. Department of Agriculture (USDA) data shows a decrease in farmland over the same period.

Second, CARB should convene an expert working group to consider issues related to the
 sustainability provisions and indirect land use change. CARB has utilized working groups in the
 past to analyze complex issues related to the LCFS and this is no different. Through meetings

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240.23 cont.	with CARB staff and board members, decisions are being made using competing schools of thought. Gathering experts to coalesce around an agreed upon science-based approach moving forward would ensure that CARB is utilizing the best information available. We recommend that
	this expert working group convenes in 2025 and provide recommendations by October 2026.
240.24	Lastly, CARB must undertake a comprehensive update of the GTAP-BIO model for soybean oil used in biofuel production. Without using the most up-to-date and accurate data, CARB is doing a disservice to the feedstock producers and California's citizens by calculating carbon intensity scores not rooted in current fact. Through CARB's own analysis we know that basing decisions off old data will lead to more—not less—emissions in the California transportation sector.
	Conclusion
240.25	MSA is encouraged by the continued successes of programs that support the development of
240.26	cleaner, low-carbon fuels. However, it is critical that CARB finalizes updates in a way that does not arbitrarily exclude agricultural feedstocks through policies that are not science-based and run afoul of CARB's mandate, including capping vegetable oil feedstocks and applying onerous sustainability guardrails that add cost without rewarding farming practices that lower CI.
240.27	CARB's Second 15-Day Changes did not address any of the fundamental issues raised by
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240.29 required under the law to achieve the maximum technically feasible and cost-effective reductions in GHGs. The two most recent 15-Day Changes show a lack of willingness to achieve the statutory obligations set forth in AB-32.

MSA is eager to continue working with CARB to support the role of agriculture in diversifying the fuel supply while reducing GHGs and increasing clean air 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,

Rence Forg

Renee Fordyce Missouri Soybean Association President







October 16, 2024

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

Submitted electronically.

RE: Proposed Low Carbon Fuel Standard Amendments (Second 15-Day Changes) – October 1, 2024

Dear Ms. Randolph,

On behalf of the Canola Council of Canada (CCC), Canadian Oilseed Processors Association (COPA) and Canadian Canola Growers Association (CCGA) we welcome the opportunity to provide feedback on the *Proposed Low Carbon Fuel Standard Amendments (Second 15-Day Changes)* released October 1, 2024.

The CCC, COPA and CCGA are non-profit industry associations that work collaboratively to help address issues impacting the canola value chain and oilseed processing sector in Canada.

The canola industry in Canada is extremely concerned that the Second 15-Day Changes continues to include a 20 % credit cap on renewable fuels derived from canola and soybean oil and proposes to add sunflower oil. No scientific rationale has been provided by CARB for the proposed cap and it has become clear this decision is completely arbitrary. In fact, the scientific data that CARB has provided¹² demonstrates that clean fuels derived from these

241.1 arbitrary. In fact, the scientific data that CARB has provided¹² demonstrates that clean fuels derived from these vegetable oil feedstocks are making positive contributions to California's GHG emission goals and will play a critical role in supporting cost effective emission reductions from the transportation sector in the future.

Proceeding with a cap, coupled with proposals to phaseout biomass-based diesel pathways, and rigid certification requirements on already sustainable feedstocks like canola and soybeans from Canada and U.S., can be expected to stifle clean fuel investments, lead to more combustion of fossil diesel fuel, drive up fuel prices at the pump and lead to poorer air quality.

To avoid these unintended consequences, we reiterate our recommendations for CARB to consider the following actions before finalizing amendments to the LCFS.

- 241.2 1. Reject any imposition of a cap on canola, soybean and sunflower oil's participation in California's clean fuel market, consistent with CARB's own analysis that a cap on virgin vegetable oils is unwarranted.
 - 241.3 2. Remove the proposal to give the Executive Officer discretion to stop accepting applications for new fuel pathways for biomass-based diesel, starting January 1, 2031. This provision is discriminatory and contradicts the overarching principle that LCFS programs be technology neutral.

¹ <u>https://ww2.arb.ca.gov/sites/default/files/2024-04/LCFS%20April%20Workshop%20Slides.pdf</u>

² <u>https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/isor.pdf</u>

Provide options, flexibility and guidance for sustainability certification. We agree that sustainability criteria are important to protect the integrity of any clean fuel program, but applying a 'one size fits all' approach to crop feedstock regardless of origin is misguided and unnecessary if a jurisdiction can provide the necessary evidence to demonstrate, on aggregate, 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 proven to address sustainability concerns while limiting regulatory burden on market participants.

If CARB insists on proceeding with certification requirements on already sustainable feedstock, we strongly recommend that additional guidance on implementation be provided, with the aim of streamlining the requirements. For example, further clarity is needed on the requirement to provide geographical shapefiles or coordinates of plot boundaries (farm, plantation or forest) that are managed to produce the biomass (i.e. crops). Implementation of this requirement should not result in the gathering of unnecessary data that ultimately becomes an untenable exercise for both industry and CARB to manage.

4. Hold an additional public process, after the conclusion of this rulemaking, on these topics. Given the nature and magnitude of the unexpected changes that have been proposed, one can only conclude that there is a clear misunderstanding in the stakeholder community about the sustainability of canola and soy for food, feed and fuel uses, therefore, it is vital for CARB to hold further consultations with stakeholders on these topics. This should be done outside of this rulemaking period to allow time for input from stakeholders, including leading academics and experts, on this topic area. Insufficient public process has occurred todate to support such significant changes at this late date, but this can and should be remedied by appropriate public dialogue on a go-forward basis, in which we would willingly participate.

Our detailed feedback on the Proposed Amendments can be found in the attached Appendix

The CCC, COPA and CCGA 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 clean fuels value chain.

Sincerely,

Chris Davison President and CEO CCC

Chris Vervaet Executive Director COPA

find what

Rick White President and CEO CCGA

Appendix

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I. Cap on credit generation for fuel derived from canola, soybean and sunflower oils.

While the intention behind CARB's Scoping Plan and historical LCFS work appears to be to displace up to 100% of the State's current fossil diesel demand, the proposal to cap canola, soybean and sunflower oils as feedstocks will likely have the opposite effect. Capping the use of these feedstocks will eliminate opportunities to displace fossil diesel and can be expected to increase fuel costs. Vegetable oils produced in Canada and U.S. are the most efficient, cost-effective and sustainably produced feedstocks on the market. Limiting their use will constrain the supply of renewable diesel. Renewable diesel and biodiesel are crucial components of California's efforts to reduce greenhouse gas emissions and transition to clean er energy sources. Any arbitrary limitation on the use of these feedstocks will create a supply-demand imbalance, driving up the costs of renewable diesel production and, consequently, the price at the pump for consumers.

CARB's findings presented at the April 2024 workshop demonstrated that renewable diesel and biodiesel have a positive impact on both consumers and the environment. CARB's "Staff Report: Initial Statement of Reasons" (ISOR) specifically modeled an alternative (Alternative 1) which "includes several policy mechanisms that have the effect of limiting the number of credits created from existing low-CI pathways" including "a limit on total credits from diesel fuels or sustainable aviation fuel produced from virgin oil feedstocks." The report's impacts are glaring – and each of them point to more fossil diesel use due to a cap on vegetable oil feedstocks.

Furthermore, capping the use of vegetable oils will require California to rely on imported feedstocks originating from outside Canada or the U.S., such as used cooking oil (UCO) from China. While free and open trade is an important market principle to uphold, it is harder to guarantee or be certain of the origin of UCO or other imported feedstocks, compared to those derived in North America. For example, there is some concern that some of the flood of UCO imports in the past year could include palm oil from southeast Asia, which is the subject of significant concerns due to the environmental profile of its production and concerns over deforestation. There is no deforestation in North America from canola and soybean production and any "indirect" impacts are already accounted for in the overly conservative life-cycle analysis and carbon intensity scores that have been developed for clean fuels from canola and soybeans.

Lastly, reaching CARB's goal to displace 100% of fossil diesel demand with the proposed feedstock constraints in place is both unrealistic and impractical. The clean fuels industry is still developing, meaning access to all sustainably produced feedstock will be critical to meet the state's ambitious targets. By capping the use of vegetable oils, the proposal risks both existing and future investments made by clean fuel producers and feedstock providers alike. In turn, this will stall progress made to reduce carbon emissions by creating a bottleneck in clean fuel production. CARB's own analysis supports this assessment.

II. Authority to phase out new Biomass-Based Diesel pathways

241.10 The proposed authority to phase out new BBD pathways in 2031 is also concerning and unwarranted. CARB has a stated goal to achieve 100 percent renewable diesel, and phasing out new pathways would be unnecessary – either because the market has already become saturated and new pathways would no longer be needed, or because the market has not yet achieved 100 percent saturation and additional fuel and feedstocks are required. The inclusion of this provision only serves to send a market signal that will limit both near and long-term supplies of feedstocks and fuel necessary to achieve the climate goals of the LCFS.

III. Sustainability Certification

Data that the canola industry and other stakeholders have shared with CARB over the past 12-24 months, clearly demonstrates that agriculture land in Canada and the U.S. is shrinking, yet crop output continues to
 grow. Figure 1 is an example of this trend, indicating that crops grown and harvested in Canada do not contribute to deforestation or 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.



Source: Statistics Canada

We reiterate our position that asks CARB to adopt an approach in the updated rule that would allow biofuels produced from crop-based feedstocks 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 appear 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.

If CARB insists on proceeding with certification requirements on already sustainable feedstock, we strongly recommend that additional guidance on implementation be provided, with the aim of streamlining the requirements. For example, further clarity is needed on the requirement to provide geographical shapefiles or coordinates of plot boundaries (farm, plantation or forest) that are managed to produce the biomass (i.e. crops). Implementation of this requirement should not result in the gathering of unnecessary data that ultimately becomes an untenable exercise for both industry and CARB to manage.

241.13 Indeed, both the U.S. Renewable Fuel Standard and Canada's Clean Fuel Regulations already recognize crop production in U.S. and Canada as meeting sustainability requirements.



1 WORLD TRADE CENTER, SUITE 1500 LONG BEACH, CALIFORNIA 90831

CHRIS GOULD Managing Director

October 16, 2024

<u>Submitted electronically via ww2.arb.ca.gov</u>

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

<u>RE: Comments on the October 1, 2024 CARB Low Carbon Fuel Standard 15-Day</u> <u>Changes</u>

Dear Chair Randolph and Members of the Board:

Carbon TerraVault Holdings, LLC ("CTV") 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"), released on October 1, 2024 (the "15-Day Changes").¹ CTV believes that the proposed modifications to LCFS credit generation for hydrogen projects introduces significant uncertainty and ambiguity, putting multibillion dollar industry-wide investment in H2 at risk. CARB must modify the 15-Day Changes or risk suppressing California's nascent low-carbon hydrogen industry.

Restricting LCFS credits to hydrogen produced using fossil gas starting with a 2030 quota and ending with a 2035 credit phase out:

- Creates significant uncertainty with the introduction of a poorly defined 2030 quota tied to an unknowable future volume of renewable hydrogen;
- Leaves insufficient time to develop and meaningfully operate an available and affordable source of low-CI hydrogen derived from fossil gas with carbon capture and storage;
- Inhibits economic incentives that will constrict supply and slow the development of California's hydrogen economy;
- Ignores the State's technology-neutral approach to carbon reduction; and
- Sends a message to investors that California's regulatory agencies may arbitrarily change rules that negatively impact the investment landscape without notice laid out by the state's own legislation.

Consistent with the 2022 Scoping Plan, California energy companies have planned for low carbon intensity ("CI") hydrogen projects that mitigate carbon emissions by employing carbon capture and storage ("CCS"),² with the understanding that these projects would receive LCFS credits. The 2022 Scoping Plan calls for a broad approach to defining low-CI hydrogen projects to support a projected massive increase in demand for hydrogen in the future. Developing a pipeline

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¹ California Air Resources Board, Proposed 15-Day Changes, <u>https://ww2.arb.ca.gov/rulemaking/2024/lcfs2024</u>.

² E.g., <u>Elk Hills Hydrogen Project Press Release</u>, California Resources Corporation (July 31, 2023).

California Air Resources Board October 16, 2024 Page 2

242.2 cont. of low-CI hydrogen projects with CCS is essential to meet state climate targets, which compels CARB to provide long-term incentives in support of this emerging industry. The 15-Day Changes, as proposed, would restrict these financial incentives starting in 2030 and eliminate them entirely by 2035, materially jeopardizing the long-term business justification for these projects and undercutting California's chance to be a leader in low-CI hydrogen production.

Moreover, finalizing such disruptive changes sends the wrong signal to investors with respect to support for low-CI hydrogen projects. The 15-Day Changes represent an unexpected and surprising proposal, exactly the kind that sends shocks through the investment and lending communities and ultimately risk provoking a sweeping retreat from investment in *any* type of low-carbon fuels because of fears of arbitrary and last-minute regulatory changes. CARB must modify the 15-Day Changes and refocus its efforts on supporting the development of California's low-CI hydrogen economy.

About Carbon TerraVault Holdings, LLC

Carbon TerraVault Holdings, LLC ("CTV"), a subsidiary of California Resources Corporation ("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 reservoirs and permanently store CO₂ deep underground. For more information about CTV, please visit <u>www.carbonterravault.com</u>.

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. CTV JV develops both infrastructure and storage assets required for CCS development in California. CRC owns 51% of 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 CO_2 annually and produce clean ammonia and hydrogen in California. The project aims to be California's first clean ammonia and hydrogen facility producing an expected 150,000 MT per annum of clean ammonia and an expected 10,000 MT per annum of clean hydrogen. The Lone Cypress Hydrogen Project, in collaboration with Lone Cypress Energy Services, expects to sequester 205,000 MT of CO_2 per year from a new hydrogen plant and the production of an expected 65 tons per day of hydrogen.^{3,4} Lastly, the Yosemite Hydrogen Facility, in partnership with Yosemite Clean Energy, expects to sequester 40,000 MT of CO_2 per year from a new hydrogen, with plans for two additional facilities. These projects contribute to our sustainability goals to reduce carbon emissions and promote clean energy.

³ Lone Cypress CDMA Press Release, California Resources Corporation (Dec. 7, 2022).

⁴ CTV expects that the Lone Cypress Hydrogen Project will utilize a blended feedstock consisting of natural gas and RNG, subject to the availability of RNG.

California Air Resources Board October 16, 2024 Page 3

Recommendations

As a California-based company committed to the energy transition, CTV supports CARB's overall goal of achieving carbon neutrality by 2045 and reducing greenhouse gas ("GHG") 242.4 emissions by 2045 to a level that is 85% below 1990 levels. In its Statement of Reasons for the December 2023 proposed LCFS amendments, CARB stated that "[m]eeting this goal will require the deployment of greenhouse gas emission reduction strategies at an unprecedented scale and *pace.*⁵ However, we are concerned that many aspects of the 15-Day Changes 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, by introducing an 80% renewable hydrogen target in 2030, followed by a 2035 removal of LCFS 242.5 credit generation eligibility for hydrogen produced using fossil gas as a feedstock, the proposed amendments only support incentives for hydrogen produced using (1) electricity generated from renewable power sources and (2) renewable natural gas ("RNG") as a feedstock. Neither source can practically meet CARB's projected demand for low-carbon hydrogen production, likely inhibiting the foundation of a meaningful low-carbon hydrogen industry in California.

To fix the issues that the 15-Day modifications create and ensure the LCFS program continues to support the development of a low-CI hydrogen economy, we respectfully request that prior to finalization of the 15-Day Changes, CARB must:

— Reject the proposed 2030 80% renewable hydrogen target in Subsection 95482(h);

- This interim target is unnecessary given the eventual phase out of credits for hydrogen production using fossil gas.
- The target is opaque, with no description of how 80% renewable hydrogen would be measured or enforced. To proceed with such a target would require additional rulemaking describing in detail what qualifies as renewable hydrogen, for example when renewable natural gas is blended with fossil gas, and how credits would be assigned in the case of exceeding the allowable amount of hydrogen produced from fossil gas.
- The target ties hydrogen produced using fossil gas to unknowable future amounts of renewable hydrogen. With large uncertainty and varying forecasts for renewable hydrogen production, there is no way to know how much hydrogen produced using fossil gas will qualify for LCFS credits. For example, if 8,000 tons of renewable hydrogen is produced in 2030, 2,000 tons of non-renewable hydrogen would qualify for LCFS credits. If 800,000 tons of renewable hydrogen is produced in 2030, 200,000 tons of non-renewable hydrogen would qualify. Thus, an investment in hydrogen produced using fossil gas would be predicated on future production of renewable hydrogen, making investment decisions extremely difficult.

⁵ 2024 LCFS Amendments Staff Report: Initial Statement of Reasons at 4 (Dec. 2023) [hereinafter "Initial Statement of Reasons"] (emphasis added).

Delay to 2045 the phase out of crediting for hydrogen production using fossil gas in Subsection 95482(h);

- Delaying the phase out to 2045 would allow sufficient time for development and financial recovery of low-CI hydrogen projects, which is needed for projects to succeed. Additionally, CARB should insert language that revisits the 2045 deadline in case renewable hydrogen takes longer to scale than anticipated.
- This would align with the 2022 Scoping Plan's intent to allow affordable low-CI production methods, like fossil gas + CCS, to meet California's growing hydrogen demand, while ensuring that renewable hydrogen becomes the dominant source of production when it becomes available in sufficient quantities.

Conclusion

As explained above, CARB must revisit various provisions of its proposed 15-Day Changes to the LCFS regulations that restrict projects producing hydrogen from fossil gas and CCS from LCFS credit generation starting in 2030. Revisions to the 15-Day Changes 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, we respectfully ask CARB to consider the proposed revisions to Subsection 95482(h) contained in this letter.

CTV appreciates the opportunity to comment on the October 1, 2024 LCFS 15-Day Changes. We thank CARB for its consideration and look forward to continued dialogue and public workshops on this matter.

Respectfully submitted,

Chris Gould

Chris Gould Managing Director

242.7



October 16, 2024 Chair Liane Randolph & Members of the Board California Air Resources Board 1001 | Street Sacramento, CA 95814

Via electronic submission

Re: Second 15-Day Changes to the Proposed Regulation Order

Dear Chair Randolph and Members of the California Air Resources Board:

The American Soybean Association (ASA) appreciates the opportunity to comment on the proposed modifications (Second 15-Day Changes) to the Low Carbon Fuel Standard (LCFS) program. ASA has welcomed engagement with the California Air Resources Board (CARB) and staff throughout this multi-year process to update the LCFS program.

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.

CARB's Second 15-Day Changes to revise the LCFS did not address ASA's major concerns with 243.1 provisions included in the August 15-day notice nor did it provide additional clarification or detail 243 2 related to sustainability reporting requirements for agricultural feedstocks. ASA does appreciate the additional flexibility related to virgin vegetable oil feedstock limitations, by extending the 243.3 compliance deadline to January 1, 2028, for all approved pathways at the date of adoption. However, additional feedstock limitations included in the Second 15-Day Changes document 243.4 could further limit soybean oil market share in California, when compared to the August proposal.

In addition to the new proposals in the Second 15-Day Changes package, ASA remains deeply concerned with the drastic pivot CARB has made in the past few months related to agricultural 243.5 feedstocks used for biofuels. ASA continues to encourage that updates to the LCFS program are based on science, as required by AB-32.

Amended Feedstock Cap Considerations

ASA has significant concerns with the virgin vegetable oil feedstock cap that was included in the initial 15-Day Changes posted in August, especially after CARB itself noted that a cap will 243.6 increase the utilization of petroleum diesel. The current proposal limits, or caps, the amount of soybean oil that is allowed to generate credits in the program at an arbitrary 20%. Now, CARB is

ASA HEADOLIARTERS 12647 Olive Boulevard, Ste. 410

WASHINGTON D.C. OFFICE 1 M Street SE, Ste. 200 St. Louis, MO 63141 Washington, DC 20003

expanding on this cap in its Second 15-Day Changes with the inclusion of sunflower oil. Adding
 additional feedstocks to the 20% aggregate cap will further limit market access for soybean oil
 cont.
 and additional gallons of low-carbon fuels.

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 Based on CARB's own analysis, a cap on credit generation for vegetable oil feedstocks will lead to an increase in fossil diesel use compared to the status quo. While ASA agrees that all feedstocks entering the California LCFS market should maintain fidelity to the assumptions underlying their life-cycle assessment (LCA), domestic agricultural feedstocks are facing a redundant, triple penalty through an outdated indirect land use change (ILUC) score, stringent sustainability reporting requirements, and a proposed arbitrary cap on credit generation while scrutiny on all other feedstocks, including imports, do not face the same restrictions.

243.8 The proposed cap increases soy's carbon intensity (CI) score for amounts over the cap from the established pathway, which is based on science, to the benchmark CI, which is not based on an LCA for soy. This is effectively increasing soy's ILUC score by upwards of 50% for many pathways without a scientific basis. In fact, CARB has refused to use new data related to ILUC while at the same time effectively increasing it by an arbitrary amount.

243.9 The increase in ILUC for ag feedstocks above the 20% threshold will effectively shut them out of the LCFS. Biomass-based diesel provides benefits GHG and emissions benefits that are unpriced by the market. As a result, they cost more to produce than they can be sold for and rely on policy to account for these benefits. Without the credit generation, soy will not be able to compete against waste feedstock imports, thereby capping use in the LCFS.

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 North American agricultural feedstocks for biofuel production are already held to a high standard for participation in the Renewable Fuel Standard (RFS) and the Canadian Clean Fuels
 Regulations. Rather than adding additional sustainable North American feedstocks to its arbitrary proposed cap, CARB should consider updating carbon intensity analysis and oversight of imported feedstocks, which are not held to the same level of accountability.

While ASA is steadfast in its opposition to the virgin vegetable oil feedstock cap and the rationale used to reach this conclusion, the Second 15-Day Changes added some additional flexibility to come into compliance with the arbitrary cap. ASA appreciates CARB's acknowledgement that biofuel production facilities cannot shift production overnight, and thanks CARB for updating the grandfathering clause to provide a 2028 compliance date for all approved pathways in the LCFS program.

Carbon Intensity Scoring and Auto Acceleration Mechanism

ASA remains concerned that without a comprehensive update to the Global Trade Analysis Project model for biofuels (GTAP-BIO) that CARB utilizes, soy-based feedstocks will be phased out of the LCFS even without the additional limitations being proposed in the Second 15-Day Changes. Current data indicates a much lower CI score for soybeans, as growers continue to improve soil practices, limit water use, lower on-farm emissions and more. On the one hand,

CARB is recommending stringent sustainability guardrails for U.S. soy, but on the other hand is 243.13 still on track to likely phase-out soy-based biofuels from credit generation by approximately 2035

cont. or sooner.

> As CARB looks to develop a more aggressive auto acceleration mechanism to reach CI reduction benchmarks sooner, using outdated methodologies will only limit the output of actual improvement over time in terms of emissions reductions. As CARB updates all other major lifecycle emissions models through this rulemaking, ASA once again urges action to update the GTAP-BIO model so that the most current, science-based data may be used to determine carbon intensity reductions.

In terms of updating the timeline for analysis of data to trigger the auto acceleration mechanism, ASA appreciates that CARB is seeking to provide additional notice to the market before a trigger is 243.14 implemented through the ability to analyze data quarter over quarter rather than just annually. This will allow the industry more time to plan and make business decisions ahead of new benchmarks triggering.

Sustainability Guardrails and Traceability Concerns

ASA remains very concerned about the sustainability guardrails. The sustainability guardrails are more onerous than the specified source requirements used for waste feedstock imports. Palm oil in Southeast Asia has had forced labor concerns¹, but CARB does not require used cooking oil 243.15 derived from palm to track social or economic sustainability. Concerningly, petroleum also does noy have to track these criteria. CARB's proposal makes it administratively easier to use nonsustainable petroleum² in the state than biofuels that have lower CI scores and are produced from sustainable feedstocks grown in the United States. Land use change is already captured in 243.16 the ILUC score, which makes it unclear what purpose the guardrails serve.

The Second 15-Day Changes offered a bit more detail about how CARB plans to implement its reporting and requirements in terms of traceability, but ASA continues to have serious concerns about how this proposal will work in practice. By way of background, soybean products pass 243.17 through many hands before final use. A soybean is produced, potentially transported to a grain elevator, then must reach a soybean processor to be separated into soybean oil and soybean meal (crushed). The meal and oil can then be delivered to end users. Because of this, ensuring the identity preservation of a soybean is not easily accomplished. Soybeans are a bulk commodity, and infrastructure in the U.S. was not developed to segregate subunits of the crop. This bulk handling system based on comingling is one of the inherent advantages the United States has as it reduces transportation costs, and subsequently on-ground emissions.

CARB's proposal states that farmers will have to declare the geographical shapefiles or 243.18 coordinates of farm boundaries starting in 2026. This raises many issues including the definition

¹ https://apnews.com/article/virus-outbreak-only-on-ap-indonesia-financial-markets-malaysia-7b634596270cc6aa7578a062a30423bb

² https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2022.858512/full

of a farm and how grain must be traced and reported if harvested from several fields but comingled at storage. While the deforestation requirements do not start until 2028, the questions 243.18 posed above are relevant for the attestations starting in 2026. At that point, farmers will have to declare the boundaries of their farm. CARB settling on one definition for 2026 and another for 2028 would create much confusion. Educational efforts will be needed ahead of 2026. Once farmers understand the program, it will be very difficult to change fundamental definitions.

> While 2026 may seem like plenty of time, it is much less for farmers in practice. Soybeans available starting at the beginning of 2026 are from the crop harvested in the fall of 2025 and planted in the spring of 2025. Farmers are purchasing inputs for that crop currently. If delivery points for the next soybean crop require data disclosure, producers need to know that now as they plan out their upcoming crops and lock in investments. So, if new LCFS regulations are not finalized until January 2025 and planting begins in March 2025, it leaves virtually no planning time for a farmer to update practices to adhere to these new attestation requirements.

If CARB insists on agricultural feedstock traceability, then it should reward sustainable practices beyond what is already assumed in the LCA. For instance, some soybeans are double cropped 243.19 meaning they are grown as a secondary crop following a primary crop within a growing season. They are not displacing other crops or land uses. Double-crop soybeans should be eligible to have the ILUC component of the CI score removed, or at least shared with the other crop in the rotation.

Entities Eligible to Apply for Fuel Pathways

ASA is concerned about CARB's proposal to give the Executive Officer the discretion to stop accepting new pathways for biomass-based diesel starting in 2031. ASA does not understand how this benefits the LCFS. Under AB-32, CARB must under statute minimize costs and 243.20 maximize GHG reductions. It is unclear how this is served by rejecting new pathways. In fact, the LCFS is best served by allowing the most available pathways. If these pathways cannot achieve cost-effective GHG savings, they will not be utilized by the market in the LCFS. In essence, an increase in pathways can only serve to improve GHG benefits in California. Singling out a single fuel for prejudicial treatment is baffling given the goals of the LCFS and the authority that establishes it.

Recommendations to CARB

cont.

- As CARB finalizes its update to the LCFS, ASA recommends several actions that will likely 243.21 prevent an increase in fossil diesel use, improve carbon intensity calculations, and improve market access for sustainable agricultural feedstock providers.
- First, CARB should not apply the vegetable oil feedstock cap proposal to North American 243.22 feedstocks. As noted above, these feedstocks are already subject to guardrails to ensure production on land that has not been converted since 2008. The RFS was designed specifically to

243.22 cont. prevent land conversion for biofuel production, and U.S. Department of Agriculture (USDA) data shows a decrease in farmland over the same period.

Second, CARB should convene an expert working group to consider issues related to the sustainability provisions and indirect land use change. CARB has utilized working groups in the past to analyze complex issues related to the LCFS and this is no different. Through meetings with CARB staff and board members, decisions are being made using competing schools of thought. Gathering experts to coalesce around an agreed upon science-based approach moving forward would ensure that CARB is utilizing the best information available. ASA recommends that this expert working group convenes in 2025 and provide recommendations by October 2026.

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Conclusion

- ASA is encouraged by the continued successes of programs that support the development of cleaner, low-carbon fuels. However, it is critical that CARB finalizes updates in a way that does not arbitrarily exclude agricultural feedstocks through policies that are not science-based and run afoul of CARB's mandate, including capping vegetable oil feedstocks and applying onerous sustainability guardrails that add cost without rewarding farming practices that lower CI.
- CARB's Second 15-Day Changes did not address any of the fundamental issues raised by ASA in the first 15-Day Changes and fails to acknowledge the potential unintentional consequences of a feedstock outlined by its own employees only a few months before. CARB is required under the law to achieve the maximum technically feasible and cost-effective reductions in GHGs. The two most recent 15-Day Changes show a lack of willingness to achieve the statutory obligations set forth in AB-32.

ASA is eager to continue working with CARB to support the role of agriculture in diversifying the fuel supply while reducing GHGs and increasing clean air 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,

Gol Delle

Josh Gackle, President American Soybean Association



October 16, 2024

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

RE: Growth Energy Comments on Proposed LCFS Amendments

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; 121 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

As our comments in response to the April workshop and the August 15-day package also noted, we continue to have serious concerns over the proposed amendments. Of particular concern are the details added to the sustainability certification requirements, the California Air Resources Board (CARB) neglecting to consider farm-level carbon reduction practices and technologies, the unilateral discretion given to the Executive Officer on new fuel pathway applications, and the authority given to the Executive Officer to modify land use change (LUC) penalty values in table 6 for the purposes of determining a fuel's carbon intensity (CI).

¹ <u>https://www.transportationenergy.org/wp-content/uploads/2023/07/Decarbonizing-Combustion-Vehicles_FINAL.pdf</u>

Continued Concerns Over Proposed Sustainability Certification

244.1

In our previous comments, we reiterated our concerns over the onerous and costly requirements on biofuels producers and farmers, and how CARB's Economic Impact Analysis (EIA) of the proposal does not discuss the sustainability certification requirement's financial burden of implementation. In the recirculated EIA, this impact is still not sufficiently addressed. Rather, the EIA acknowledges potential direct and indirect land use change "is at least partially (and potentially fully) accounted for by the LUC scores added to crop-derived pathways."² This acknowledgement renders the need for a sustainability certification moot as potential LUC concerns for crop-based feedstocks are specifically addressed in Table 6, which will itself include more geographically refined data under the proposed amendments. In Table 6, Corn starch bioethanol is given an automatic 19.8 gCO2e/MJ penalty for indirect land use change (ILUC).³ Relatedly, we also believe the 19.8 penalty 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.⁴ Adding the sustainability certification requirement to the current ILUC score amounts to an unfair and unnecessary double penalty for corn starch bioethanol.

As we have previously commented, the concerns over LUC factors 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 1900.⁵ At the same time, the per acre yield has increased more than 600%.⁶ As shown in the graph below, the number of acres harvested annually have consistently hewn to the average since 1900.

² <u>https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/recirculated_draft_eia.pdf</u>

³ https://ww3.arb.ca.gov/fuels/lcfs/iluc_assessment/iluc_analysis.pdf

⁴ <u>https://iopscience.iop.org/article/10.1088/1748-9326/abde08/pdf</u>

⁵ https://www.nass.usda.gov/Publications/Todays_Reports/reports/croptr19.pdf,

https://www.nass.usda.gov/Charts and Maps/Field Crops/cornac.php

⁶ <u>https://www.agry.purdue.edu/ext/corn/news/timeless/YieldTrends.html</u>



While the current proposal details the "best environmental management practices" required for biomass used in fuel pathways and those climate-smart agriculture (CSA) practices result in the reduction of carbon emissions, CARB continues to disregard these and other practices when factoring CI scores. 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.⁷ 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.⁸

CSA practices are an important component to bioethanol's continued efforts to get to netzero. We urge CARB to recognize these practices and their carbon-reduction potential and allow CSA practices to be considered when determining a pathway's CI.

⁷ <u>https://growthenergy.org/policy-priority/climate-smart-agriculture/</u>

⁸ <u>https://www.gov.ca.gov/2020/10/07/governor-newsom-launches-innovative-strategies-to-use-california-land-to-fight-climate-change-conserve-biodiversity-and-boost-climate-resilience/</u>



Carbon Intensity of Ethanol Continues to Approach Net-Zero

Additionally, changes to section 95488.9(g)(2) expand the scope of the sustainability requirement and expose the limitations of its enforceability to such a degree that it raises the question of whether CARB has the resources to enforce the proposed mandate that biomass-based feedstocks are "cultivated and harvested in accordance with all local, State, and federal rules and permits." Such broad, unrefined language, added to the amendments just one month before the Board is set to vote on the proposal, raises a multitude of questions:

- Does this added criteria apply only to environmental and sustainability factors related to the new sustainability requirement?
- Would bioethanol be assigned the CI of CARBOB if the farm from which the corn is sourced, for instance, failed to pay a state workers' compensation insurance premium or violated a federal labor law?
- Would these same standards apply to the supply chain for fuel pathways derived from other renewable sources?
- What resources does CARB have to enforce such a diverse patchwork of federal, state, and local rules?
- Does CARB have the authority to investigate instances of alleged violations of another state's laws?

We oppose the addition of this broad and vague mandate, particularly since, as we noted above, bioethanol would be required to follow these sustainability requirements without any credit for on-farm CI reduction practices. We strongly encourage the Board to reconsider this provision and allow staff and stakeholders the opportunity to investigate

244.3 cont. the breadth, cost, and unintended consequences of such vague text before its consideration.

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. According to the April 10 staff presentation, 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." The proposed amendments require approved certification systems for the sustainability requirement to take "social and economic criteria" into account alongside environmental concerns. While important and laudable goals themselves, "social and economic criteria" have no bearing on GHG reduction. Additionally, many aspects of these audit provisions are addressed by federal programs. For instance, the Fair Labor Standards Act has clear employment guidelines specifically for the agriculture industry.⁹ Furthermore, if the proposal is adopted, crop-based biofuels would be the only feedstock for which these criteria would be audited.

Expanding Specified Source Feedstocks

We acknowledge CARB's recognition of the use of a variety of "waste, residue, by-product or similar material in a fuel pathway", particularly the inclusion of distiller's corn oil, and its consideration as specified source feedstock. Biofuels producers are pushing innovations to use every part of the corn crop. While traditionally considered waste, corn stover and corn kernel fiber have increasingly been used as a feedstock for bioethanol production. As a byproduct of corn bioethanol production, we appreciate the recognition and inclusion of corn stover in the list of specified source feedstocks, and encourage the Board to also recognize corn kernel fiber.

Biofuel Cap and Executive Officer Discretion on Fuel Pathways and LUC Values Betrays Technology Neutrality

CARB has made clear its intentions to increase the role and market for zero emissions vehicles (ZEVs) in the state. However, the revised amendments give the Executive Officer discretion to reject new fuel pathway applications for particular crop-based fuels solely based on achieving a threshold of 132,000 registered Class 3-8 ZEVs. It endows the Executive Officer with such an authority without a proper rulemaking. This, combined with a 20 percent cap on the use of specific biofuels for credit generation opportunities sets a dangerous precedent for the use of all GHG reducing feedstocks and technologies, violating the LCFS' commitment to technology neutrality. The program already requires the use of a lifecycle model and assesses penalties for land use change, further limits make little to no sense. Using the full range of Class 3-8 trucks allows for the very real possibility this threshold can be met with smaller lighter vehicles (Class 3-4), thus leaving the larger, heavier vehicles (Class 7-8) reliant on liquid fuel that may only be available in

244.5

244.4

⁹<u>https://www.dol.gov/agencies/whd/agriculture/flsa</u>

fossil fuels if new biofuels pathways are not allowed. This could be especially true after
 an update to CA-GREET where legacy pathways are termed out. This situation would
 result in environmental backsliding and loss of GHG benefits.

Similarly, the proposed discretion of the Executive Officer to revise LUC values in Table 6 if such a value is deemed not "conservatively representative of a particular region/feedstock/fuel combination" also betrays the Standard's technology neutrality. This proposed provision, much like the sustainability certification requirement, singles out crop-based feedstocks.

Not only are concerns over LUC values unwarranted for cornstarch bioethanol, as we previously detailed, but the proposal does not provide any opportunity for a LUC value to be revised down, even if the Executive Officer were presented with "the best available empirical data" indicating a lower value. For instance, data showing corn bioethanol with a LUC value less than the 19.8 gOC₂/MJ would not be considered.

Approval of E15

244.7

244.8 We acknowledge CARB'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.¹⁰ 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 more than 3,500 retail sites in 33 states. Since then, drivers in America have relied on E15 to drive 100 billion miles.¹¹

¹⁰ <u>https://ww2.arb.ca.gov/sites/default/files/2024-04/LCFS%20April%20Workshop%20Slides.pdf</u>

¹¹ https://growthenergy.org/2024/01/29/100-billion-miles-e15-growth-energy/



244.8 cont.

244.9

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 costeffective, environmentally beneficial fuel that can be used in nearly all the state's 31 million gasoline-powered vehicles.¹² 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*.¹³ Neither will it have a negative impact on land use change for bioethanol.

We urge CARB to complete the analysis of and approval process for E15 so that Californians can take advantage of this more affordable, cleaner burning fuel that can be used to power more than 96% of the light duty vehicles on the road today.

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.¹⁴ 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

¹² <u>https://ethanolproducer.com/articles/montana-becomes-49th-state-to-approve-the-sale-of-e15</u>

¹³ http://www.airimprovement.com/reports/national-e15-analysis-final.pdf

¹⁴ https://ww2.arb.ca.gov/sites/default/files/2023-08/CATS%20Technical 1.pdf

Act of 2022. This is a welcome update to CATS and a recognition of the positive impact cont. 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.¹⁵ The current size of California's FFV fleet stands at more than 1.3 million vehicles.¹⁶ 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.

Expand Access to Low-CI Power Sourcing for Biofuels Producers

With respect to Low-CI power sourcing, the proposal fails to recognize its carbonreduction potential in biofuels production. The proposal currently only allows this mechanism for hydrogen as a transportation fuel, Direct Air Capture projects, and electricity as a transportation fuel. Firstly, this 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.

244.9

¹⁵ https://ww2.arb.ca.gov/sites/default/files/2024-03/Annual E85 Volumes Chart 3-8-2024.pdf

¹⁶ <u>https://afdc.energy.gov/vehicle-registration?year=2022</u>

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.

Finally, similar to other proposed provisions in the amendments, limiting the approved use of indirect accounting for Low-CI power sourcing to a handful of fuels and processes violates the LCFS' commitment to technology neutrality.

Accelerate the Use of Sustainable Aviation Fuel (SAF)

As producers of one of the most scalable feedstocks for SAF production, 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 recent proposed amendments. The LCFS Program is a critical tool to addressing climate change. We urge the Board to recognize the role biofuels has played and can continue to play in making California's fuel mix more sustainable, and help the state achieve its progressive climate goals through the expanded use of bioethanol.

Sincerely,

table D. E

Christopher P. Bliley Senior Vice President of Regulatory Affairs Growth Energy

Comment Log Display

Here is the comment you selected to display.

Comment 245 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Kirk
Last Name	Olsen
Email Address	Non-web submitted comment
Affiliation	
Subject	Proposed Low Carbon Fuel Amendments

Comment	Comment received during 2nd 15-Day Comment Period.
	Comment submitted by Clerk on behalf of Commenter.
	"New amendments proposed by the California Air Resources Board
	(CARB) under the Low-Carbon Fuels Standard (LCFS) program could
	drive fuel prices up by as much as \$0.85 per gallon soon and by up
	to \$1.50 per gallon by 2035. Please delay all votes on this topic
245.1	until clear information regarding the costs of these amendments has
	been provided to the voters of California. Our fuel prices are
	already the highest in the Continental United States, and we cannot
	afford for them to go any higher, especially with potential price
	shocks on the horizon due to instability in Russia, Iran, and other
	unfriendly fuel producing nations.
	Thank you,"

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-18 12:34:40

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Board Comments Home

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Comment 246 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Randy
Last Name	Michetti
Email Address	Non-web submitted comment
Affiliation	
Subject	Proposed Low Carbon Fuel Amendments

Comment

Comment received during 2nd 15-Day Comment Period. Comment submitted by Clerk on behalf of Commenter.

"Further to the concerns raised by my representative Greg Wallis and his colleagues in his letter to The Honorable Liane Randolph Chair, California Air Resources Board dated October 15, 2024, when can the voting public expect to see updated cost projections for the proposed amendments to the Low-Carbon Fuels Standard (LCFS) program? Full disclosure of long-term financial impacts and the need for greater public participation is required before changes as significant as these are voted upon and enacted.

Please DO NOT proceed with the planned LCFS hearing until representative Wallis and other representatives have had an opportunity to better understand the cost implications of the proposed changes. The last thing California needs is more costs for the people of this state! The high cost of living in California is already causing sizeable numbers of people to leave the state. That should be a big red flag for Chairman Randolph and other regulators that are considering policy changes that only serve to drive costs higher with limited benefit."

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-18 12:34:40

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

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Comment 247 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Herman
Last Name	Galicia
Email Address	Non-web submitted comment
Affiliation	
Subject	Proposed Low Carbon Fuel Amendments

С	0	m	m	e	nt	

247.1

Comment received during 2nd 15-Day Comment Period. Comment submitted by Clerk on behalf of Commenter.

"I am requesting the CARB delay the vote until updated cost projections are provided to the public. Actually, I think this particular rule making should be presented to the citizens as a Proposition ballot measure; as any tax, bond issue, etc. would be.

I am a liberal Californian, and voting straight Democrat in this coming election purely to preserve the U.S. Constitution. It isn't always that way.

Our gas prices are already obscene, compared to a lot of other states. Further increases in that differential could result in unintended political and social consequences. The public hasn't been made aware of the changes that will further increase our costs, much like a tax. I think more time should be given for science to develop some alternatives, as further modifications are probably producing smaller improvements at increasingly greater costs.

The supermajority in the legislature is walking a fine line, along with many of our state boards and committees. I believe we are reaching the limits of traditional liberalism, as governmental revenue vs. spending or personal income vs. expenses are reaching a point of financial destabilization."
Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-18 12:34:40

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

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Comment 248 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Anita
Last Name	Fields
Email Address	Non-web submitted comment
Affiliation	
Subject	Proposed Low Carbon Fuel Amendments

Comment	Comment received during 2nd 15-Day Comment Period. Comment submitted by Clerk on behalf of Commenter. "CARB Members,
248.1	Please delay the vote on the above-referenced proposed amendments until updated cost projections are provided to the public. Thank you."

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-18 12:34:40

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

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Comment 249 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Bethany
Last Name	Ballard
Email Address	Non-web submitted comment
Affiliation	
Subject	Proposed Low Carbon Fuel Amendments

Comment	Comment received during 2nd 15-Day Comment Period. Comment submitted by Clerk on behalf of Commenter.
	"I'm a resident of California. I read about the proposed amendments by CARB. Please delay the upcoming vote until updated cost projections are provided to the Public.
249.1	Californians are currently paying \$1.50 more per gallon for gasoline than the national average. Now, new amendments proposed by the California Air Resources Board (CARB) under the Low-Carbon Fuels Standard (LCFS) program could make this even worse, driving prices up by as much as \$0.85 per gallon soon and up to \$1.50 per gallon by 2035.
	CARB has not been transparent about the real impact these changes will have on fuel costs. This is a continuation of UN Sustainability Goals which aims to further bring the economy of our State, and nation, down instead of raising third world nations up. The result in our State will be more homeless and poverty stricken people who will have no private transpiration for work. Please keep our population from more poverty.
	I am urging that you delay your vote and provide clear information

249.1 cont.	before moving forward with policies that could make living in California more unaffordable."
Attachment	
Original File Name	
Date and Time Comment Was Submitted	2024-10-18 12:34:40

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

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Comment 250 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Doug
Last Name	Padgett
Email Address	Non-web submitted comment
Affiliation	
Subject	Proposed Low Carbon Fuel Amendments

Comment	Comment received during 2nd 15-Day Comment Period.
	Comment submitted by Clerk on behalf of Commenter.
	"To: California Air Resources Board (CARB)
	I understand you are proposing amendments to the Low-Carbon Fuels
	Standard (LCFS) program. I urgently request you delay the vote
	until updated cost projections are provided to the public.
	The carbon emitted by the ships bringing foreign oil to our state
	FAR EXCEEDS the carbon emitted by all our vehicles in this state
250.1	combined, yet you are forcing our oil wells and refineries IN THIS
	STATE to restrict their utilization and capacity. This process is
	costing me dearly at the gas pump. Now you want to make it worse
	with your amendments, without due consideration to the impact on me
	and all of us as citizens.
	Reconsider your policies at every level and bring back robust
	IN-STATE oil production."

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-18 12:34:40

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

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Comment 251 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Leigh		
Last Name	Raley		
Email Address	Non-web submitted comment		
Affiliation			
Subject	Proposed Low Carbon Fuel Amendments		
Comment	Comment received during 2nd 15-Day Comment Period. Comment submitted by Clerk on behalf of Commenter.		
251.1	"I am writing to request, delaying the vote on "Proposed Low Carbon Fuel Amendments". Raising taxes on gasoline raises the cost of all essential commodities. CARB needs to provide updated cost projections to the public."		

Attachment

Original File Name

Date and Time Comment Was Submitted

2024-10-18 12:34:40

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

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Comment 252 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

First Name	Greg
Last Name	Varra
Email Address	Non-web submitted comment
Affiliation	
Subject	Proposed Low Carbon Fuel Amendments

Comment	Comment received during 2nd 15-Day Comment Period. Comment submitted by Clerk on behalf of Commenter.
	"To whom it may concern:
	California's gas prices are already \$1.50 higher than the rest of
	the nation. Consumers are strapped with the high cost of living and
<i>(</i>	taxes in our state. Not to mention, the federal burden being
252.1	imposed on us through inflation, high interest rates, and
	astronomical and spiraling out of control national debt of \$35
	Trillion growing by the minute.
	PLEASE DELAY THE VOTE UNTIL COST PROJECTIONS ARE PROVIDED TO THE
	PUBLIC. We need full transparency here and without cost projections
	we have no idea what we're being strapped with.
	Salutations."

Attachment

Original File Name

Date and Time Comment Was Submitted 2024-10-18 12:34:40

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

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900 7th St. NW, Suite 820 Washington, D.C. 20001 Ph: (605) 965-2200 **poet.com**

October 16, 2024

Clerk of the Board California Air Resources Board P.O. Box 2815 Sacramento, CA 95812

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

RE: POET COMMENTS ON OCTOBER 1, 2024 PROPOSED LOW CARBON FUEL STANDARD AMENDMENTS

Dear CARB Members:

POET appreciates the opportunity to provide comments on the California Air Resources Board's ("CARB") October 1, 2024, Proposed Low Carbon Fuel Standard ("LCFS") Amendments ("Second Revised Proposed Amendments").¹ POET has participated actively in CARB's ongoing rulemaking and submitted detailed <u>comments</u> on its own behalf and as part of a <u>coalition</u> on February 20, 2024, regarding the Amendments initially proposed in December 2023 ("Original Proposed Amendments"). POET also attended the LCFS rulemaking workshop held on April 10, 2024, and submitted written <u>comments</u> regarding the matters discussed and presented during the workshop. More recently, POET submitted <u>comments</u> in response to the Revised Proposed Amendments published on August 12, 2024, and on October 1, 2024, <u>commented</u> on CARB's Draft Environmental Impact Analysis. Given POET's extensive participation in this rulemaking process and the limited changes embodied in the Second Revised Proposed Amendments, we focus our comments here on the larger implications of CARB's proposed rulemaking on the supply of low carbon liquid transportation fuel to California and emphasize policy alternatives that would better meet LCFS program goals.

253.1

For the reasons articulated in our prior written comments, POET remains opposed to the sustainability certification system CARB has proposed for corn ethanol, which is duplicative of existing U.S. state and federal environmental safeguards and undermines LCFS program goals by closing off practical decarbonization pathways for biofuels. POET also remains opposed to many of the implementation features of the proposed sustainability requirements, which impose commercial costs and regulatory penalties that will *almost certainly raise both the carbon intensity*

¹ See CARB, Attachment A-1, Proposed 15-Day Changes and 45-Day Changes Compared to the Current Regulation, Proposed Amendments to the Low Carbon Fuel Standard Regulation, (Oct. 1, 2024).

and price of ethanol in California. Although we appreciate CARB's revised proposed treatment of corn stover as a "Specified Source Feedstock,"² the proposed rule continues to impose unnecessary and costly sustainability requirements on biomass waste feedstocks like corn kernel
253.1a fiber, which do not threaten any of the alleged environmental impacts that underlie CARB's rulemaking. Here as elsewhere in the proposed rule, requiring certifications and audits around the harvesting of otherwise unused agricultural wastes simply makes it more expensive for POET and other biofuels producers to supply California with low carbon liquid fuel, and serves no discernible public purpose.

POET believes that CARB should abandon the expensive, redundant, and unfounded sustainability requirements it has proposed for corn ethanol. In the alternative, we continue to urge CARB to leverage its proposed sustainability program to encourage the production of low carbon liquid fuel rather than penalize it.

253.2 I. CARB's Rulemaking Should Align with Leading-Edge Federal Policymaking on The Regulation of Biofuels

CARB's proposed sustainability requirements come at a time when the Biden Administration has advanced federal climate change policies that are unprecedented in scope and reflect a genuinely technology neutral approach to decarbonizing the economy. Under the Inflation Reduction Act ("IRA"), biofuels, including ethanol, are subject to incentives³ that are driving investments in new technologies, like carbon capture and sequestration ("CCS"), thermal batteries that can store excess capacity from renewable energy sources, and innovative on-farm practices to lower the carbon intensity of feedstocks. The IRA reflects the understanding that low carbon liquid fuel will continue to play an important role in hard-to-decarbonize sectors such as aviation,⁴ and in on-road transportation — even as EVs and other alternative fuel technologies emerge and gain market share. Federal policymaking in this area is well-supported by the latest transportation fuel modeling at Argonne National Laboratories and by the most current climate policy research, which demonstrates the potential of ethanol as a net-zero carbon liquid fuel.

253.2

Research published just last month by former Energy Secretary Ernest Moniz makes clear that there are technologies and feedstock production practices available now that, if properly incentivized, allow for the economically feasible production of deeply decarbonized ethanol.⁵ The

² Id. at § 95488.8(g)(1)(A)5.

³ See Clean Fuel Production Credit, 26 U.S.C. § 45Z (2022); Sustainable Aviation Fuel Credit, 26 U.S.C. § 40B (2022).

⁴ Department of the Treasury and IRS, *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, Notice 2024-37, at Section 4.01 (Apr. 30, 2024), https://www.irs.gov/pub/irs-drop/n-24-37.pdf* ("Notice 2024-37").

⁵ Moniz, Ernest et al., A Strategic Roadmap for Decarbonizing the U.S. Ethanol Industry - EFI Foundation, at 36

chart below shows that on-farm practices like no-till farming, the planting of cover crops, and more efficient management of nitrogen fertilizers can be implemented now, and can reduce the carbon intensity of ethanol by over 30gCO2e/MJ.⁶ Combined with CCS projects under development, ethanol production could achieve a net zero carbon intensity in the coming decades.



Cost estimate ranges 🔷 Carbon intensity reduction potential

A negative cost means that the new measure costs less than the currently adopted measure because of reduced energy or fertilizer inputs (e.g., no-tillage farming, 4R nitrogen management), a lower cost for securing energy (e.g., PPAs), policy incentives (e.g., fermentation CCUS), or additional electricity production (e.g., biomass CHP). Source: EFI Foundation analysis.

CARB's proposed sustainability requirements and its projection that ethanol crediting will be cut in half by 2035⁷ is out of step with leading-edge federal climate policies and ignores the role that ethanol could play in the LCFS as producers like POET adapt to federal incentives.

II. CARB Should Allow Qualified Verification Bodies to Certify Carbon Reductions as Part of Sustainability Audits

As POET has previously commented, CARB's proposed amendments not only fail to incentivize the decarbonization of ethanol but promulgate rules likely to have the opposite effect. CARB's proposed sustainability certification scheme will interpose cost and complexity throughout the biofuel supply chain on a massive scale in a short period of time. Biofuel producers will be required

253.3

⁽Sept. 19, 2024), <u>https://efifoundation.org/foundation-reports/a-strategic-roadmap-for-decarbonizing-ethanol-in-the-united-states/</u>.

⁶ *Id.* at 7, Fig. ES 3.

⁷ Recirculated Draft Environmental Impact Analysis for the Low Carbon Fuel Standard Regulation (Aug. 16, 2024) at 21.

253.4 to pay premiums for qualifying feedstock, with the consequence that ethanol costs will rise for blenders and consumers. Given the costs of compliance, the lack of incentives to decarbonize, and the potential for farmers to refuse participation in CARB's certification scheme, there is a real possibility that *higher carbon* ethanol will ship to California, with lower carbon fuel finding more favorable markets.

CARB can avoid the worst outcomes from its proposed sustainability certification program by adopting simple changes to *recognize carbon reductions* as part of the certification process. As POET and other stakeholders have urged repeatedly, CARB could easily adopt Argonne's well-vetted GREET modeling values for carbon-reducing on-farm practices and could verify those practices through the same third-party certification providers to use established protocols to provide a more granular CI score for California biofuel pathways. Pathway-specific carbon certifications — which seek to measure, among other things, the actual carbon intensity of biofuel feedstock production instead of assigning a default value for the carbon intensity of agriculture — are the norm under the International Sustainability and Carbon Certification (ISCC) program⁸ that CARB has enshrined as a qualifying standard in its proposed rule.⁹

CARB's Second Revised Proposed Amendments, which continue to require on-farm audits in which verification bodies must *ignore* the carbon-reducing effects of the sustainable agricultural production that CARB now mandates, undermine any notion of technology neutrality in the LCFS, and will operate to exclude low-carbon biofuels from California's program.

III. CARB Should Encourage, Not Punish, the Production of Waste-Based Biofuels

POET appreciates CARB's responsiveness to our prior comments regarding the treatment of corn stover under the proposed sustainability certification system. Designating corn stover as a "Specified Source Feedstock" under § 95488.8(g), and exempting stover from the more onerous and unnecessary "Sustainability Requirements" of § 95488.9(g), recognizes that corn stover is a low-risk biomass-based waste generated during harvests and can be removed from the field at scale and repurposed as a low-carbon heat source for biofuel production.

Unfortunately, CARB's Second Revised Proposed Amendments continue to assign unwarranted risks to the sustainability of other biomass-based wastes and agricultural residues. In particular, CARB's proposed rule subjects corn kernel fiber to the "Sustainability Requirements" of § 95488.9 — notwithstanding that fiber has long been recognized as a low-carbon waste feedstock under the LCFS. Nothing in CARB's rulemaking documents supports assigning "sustainability"-related risks to corn kernel fiber, which offers no nutritional value in food supply chains, and

253.6

⁸ See Attachment A, ISCC EU 205 Greenhouse Gas Emissions, Version 4.1 (Jan. 2024).

⁹ Supra Note 1 at § 95502 (c)(3) E.

supplies the lowest carbon component of corn ethanol produced at dry milling facilities. Indeed, the latest proposed version of the CA-GREET model features a simplified CI calculator that models corn kernel fiber as a waste feedstock with *no upstream feedstock or indirect emissions*.¹⁰ By requiring that the fiber component of corn feedstocks satisfy sustainability requirements, CARB is effectively prohibiting any beneficial use of *wastes* generated by non-conforming grain, which will be grown and sold regardless of the market signals embodied in CARB's regulations. This approach abandons carbon reductions, places a premium on the purchase of biofuel waste feedstocks, and will exacerbate the negative impacts of the proposed sustainability requirements by excluding cheaper lower carbon fuel from the California market.

For these reasons, POET urges CARB to remove corn kernel fiber from the "Sustainability Requirements" of § 95488.9(g) and thereby maintain incentives to produce low carbon liquid fuel from proven low-risk waste feedstocks.

IV. CARB Should Make Clear That Qualifying Feedstocks May Be Intermingled and Mass-Balanced with Nonconforming Feedstocks

253.8

253.7

cont.

CARB's Second Revised Proposed Amendments leave uncertain how biofuel producers must account for the carbon intensity of fuel co-produced from both conforming and non-conforming feedstocks under §§ 95488.9(g)(1)-(3). Proposed § 95488.8(g)(4) provides that "if the biomass does not meet the requirements of section 95488.9(g)(1)-(3), the finished fuel developed from the ineligible biomass must be assigned the CARBOB carbon intensity for ethanol produced using uncertified biomass." But POET expects that biofuel producers that ship to California will procure both LCFS-eligible and ineligible feedstock and may intermingle these feedstocks as part of normal supply chain operations. At minimum, CARB should clarify in its regulations that biofuel producers may conduct mass balancing to ensure that biofuel production commensurate with the volume of LCFS-eligible feedstock used at a facility may be assigned a carbon intensity score that aligns with the CI assigned to approved fuel pathways at that facility. This approach is widely accepted and embodied in Canada's Clean Fuel Regulations and in ISCC certification programs.

As POET has commented previously, CARB should authorize even more flexibility in mass balancing, to include mass balancing of feedstocks across the manufacturing facilities of each producer. This approach, adopted under the ISCC PLUS program, allows for the generation of sustainable feedstock credits in circumstances where the volume of qualifying feedstock at a biofuel facility exceeds fuel production in a mass balancing period. Such an approach incentivizes the procurement and use of sustainable feedstocks in areas where farmers have widely adopted

¹⁰ See CARB Proposed Tier 1 Simplified Calculators – Starch and Fiber Ethanol (Oct. 1, 2024) available at <u>https://ww2.arb.ca.gov/resources/documents/lcfs-life-cycle-analysis-public-comment</u>.

253.8 cont. certified sustainable practices and avoids the carbon emissions associated with transporting eligible feedstocks to production facilities distant from available sustainable biomass.

V. CARB Should Approve E15.

POET again urges CARB to expedite its approval of E15, which has been thoroughly studied in California for years, and which offers material climate and health benefits relative to E10. As noted in previous comments submitted to CARB and the California Energy Commission, E15 will provide immediate economic relief from historically high gas prices while cutting 1.8 million metric tons of GHG emissions annually, equivalent to removing more than 411,000 internal combustion engine vehicles off the road.

CONCLUSION

POET appreciates the opportunity to participate in this rulemaking and has devoted substantial resources to analyzing and offering feedback to the agency as it considers paradigm shifting changes in the regulation and treatment of biofuels under the LCFS program. We must express our disappointment that CARB has not grappled meaningfully with the likely effects of the proposed sustainability certification requirements on the cost, availability, and carbon intensity of the California ethanol supply. We must also express disappointment that CARB, through this rulemaking, appears unwilling to *recognize* carbon reductions in the ethanol supply chain even as CARB is acting to *mandate* these reductions. As Californians continue to purchase, own and operate millions of vehicles that consume liquid transportation fuel, we look forward to future opportunities to work collaboratively to lower emissions from these vehicles. Unfortunately, the agency's proposed rule, as expressed in the Second Revised Proposed Amendments is not a step forward in that direction.

If you have any questions, please contact me at Josh.Wilson@POET.com or (202) 940-6487.

Sincerely,

2 TAM

Joshua P. Wilson Senior Regulatory Counsel

ATTACHMENT A



ISCC EU 205 GREENHOUSE GAS EMISSIONS



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Document Title: ISCC EU 205 Greenhouse Gas Emissions

Version 4.1

Valid from: 01 January 2024

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Summary of Changes

The following is a summary of the mainchanges to the previous version of the document (ISCC EU System Document 205 v 4.0). covers relevant adjustments based on the Implementing Regulation (EU) 2022/996 on rules to verify sustainability and greenhouse gas emission saving criteria and low indirect land-use change risk criteria (IR). Minor amendments, e.g. corrections of phrasings and spelling mistakes, are not listed.

Summary of changes made in version 4.1	Chapter
 Additions: "Following the requirements of the recast Renewable Energy Directive (2018/2001/EC), Article 31(1)-31(3), Annexes V and VI and Implementing Regulation on certification (IR), ISCC requires a minimum level of GHG savings for final biofuels, bioliquids and biomass fuels" "An installation shall be considered to be in operation once the physical production of fuel, heat or cooling, or electricity has started (i.e. once the production of fuels including biofuels, biogas or biofuels, or production of heat, colling or electricity from biomass fuels hast started)." "Traders with/without storage do not need to calculate GHG emissions. Instead they must provide mode and distance of transportation on the Sustainability Declaration to the next supply chain element." "For RFNBOS ISCC provides a separate guidance document based on RED II Article 25(2), Article 22 and COM DA referred to in Article 25(2)." 	2
General: Update of Figure 2	3, footnotes
 Additions: "The same approach applies for NUTS2 values." "For transport and distribution it might be acceptable to use disaggregated default values for similar feedstocks if the transported goods can be transported in a similar way and the density is similar." 	3.1
 "Any updates to the NUTS2 values by Member States which have not been included in the reports published before 2015 (pre-ILUC Directive), or the submission of new "NUTS2 equivalent values" for third countries, requires recognition by the EC." Addition: 	3.2, footnotes
 "as well as IR Article 20 and Annexes V, VII, IX, Comission Decision 2010/335/EU as of 10 June 2010 (as amended under the RED II). For e_{ec} and e_{sca} specifically Annex V and VII of IR and ISCC's specifications as described in this document apply." "Only NUTS2 values or values from equivalent regions in third countries that had been subject to an IR can be applied. Furthermore, any values used under REDI are no longer valid due to differences in the GHG emission calculation methodology applied under the REDII methodology." "They shall be calculated as a sum, taking into account the relative shares of the respective inputs and their emission factors. Therefore, the GHG value must be calculated as a single value for the whole amount of the biogas / biomethane, resulting from the co-digestion" 	
• "Biograce (recognized version)"	

Summary of changes made in version 4.1	Chapter
 "like the "Overview of Standard Calculation Values" table provided by the European Commission or Annex of this document I "List of emission factors and lower heating values (LHVs)"" 	4.1
Deleted:	
 "(including the filling station)" 	
Additions:	
 "The emissions of depots and filling stations may be calculated using the data provided by the JRC. The provided values (depot: 0,00084 MJ/MJ fuel, filling station: 0,0034 MJ/MJ fuel) must be multiplied by the appropriate national electricity EF from the Implementing Regulation (EU) 2022/996." 	4.2
 General: This summary of changes does not outline the entire new chapter on calculating eec emissions. Specifications for calculation of eec were adjusted based on IR Annex VII. Change from EM_{diesel} to EM_{fuel} Added specifications for emissions from storage Amended specifications for EM_{electricity} Added specifications to calculate emissions from neutralization of fertiliser acidification and soil emissions from liming (aglime) Added reference to Annex IX of the IR and other sources for emission factors for cultivation Adjustments to specifications related to calculate crop- and site- specific N₂O emissions based on IR Annex VII. This summary of changes does not outline the entire new chapter on calculate N input in crop residues Additions: "Amount of aglime in kg aglime (CaCO₃)" "Transportation mode and distance up to the FGP" 	4.3.1,
 General: The guidance for calculation and verification of esca values has been reworked extensively based on the IR Annex V. This summary of changes does not include the full extent of changes to this chapter. Additions: "Regarding penalties relating to farmers operation under a group, ISCC will enforce the penalties and duly inform all other voluntary schemes as well as to publish this information as described in ISCC EU system document 102 "Governance"" 	4.3.3, footnotes
 General: Section for calculation of transport emissions has been updated to correspond with IR 2022/996. Clarification of trader responsibilities Additions: "if the empty return ways are attributable to the certified company they must be taken into account. If the return way is not empty and accountable to another company, which can be proven by relevant documentation, return ways can be excluded for transport calculations)" "The emissions of depots and filling stations may be calculated using the data provided by the JRC. The provided values (depot: 0,00084 MJ/MJ fuel, filling station: 0,0034 MJ/MJ fuel) must be multiplied by the appropriate national electricity EF from the IR 2022/996" 	4.3.4

Sumn	nary of changes made in version 4.1	Chapter
•	"For this purpose a standard factor for grid gas losses of 0.17 g CH4/MJ Natural Gas supplied should be used."	
Gener	4.3.5	
•	EF for grid eletricity must be sourced from the IR on a national level.	
•	Specific requirements for biomass fuels consolidated into 4.3.5.2	
Delete	d:	
•	"If electricity is sourced externally from the grid, the emission factor for electricity from the regional electricity mix shall be used (average emission intensity for a defined region, EFregional electricity mix). In the case of the EU the most logical choice is the whole EU. If electricity from renewable energies is directly consumed (i.e. not connected and supplied from the grid), an adapted EF for the type of renewable electricity may be used (please see chapter 4.3.1.1 for further information)."	
Additi	ons:	
•	"If electricity is consumed from the grid, the EF of the national/country electricity mix (EFelectricity) shall be used. The IR provides country-specific EFs for electricity. "	
•	"Liquefaction emissions and losses must also be accounted for. If no actual data is available, electricity consumption of 0.06048 MJ (LV) / MJ fuel and LNG losses of 0.13 kJ/MJ fuel shall be considered. The electricity consumption has to be multiplied with the respective national grid mix factor from the IR."	
Gener	al:	
•	This summary of changes does not include the full extent of changes made to this chapter	4.3.6
Additi	ons:	
•	and CCS	
Delete	d:	4.3.7
•	"Please note that for the calculation of the feedstock factor the LHV per dry ton needs to be applied while for the calculation of the allocation factor LHV values for wet biomass need to be used as this approach was also applied for the calculation of the default values."	
Additi	on:	4.3.9
•	Energy producers must apply the respective fossil fuel comparator value for the target market.	
Gener	al:	5
• Additi	Further specifications of verification requirements for both default and actual GHG emission calculations	
Audith	"If the emissions devicts similarity from turied values (many the state)	
•	deviation), or calculated actual values of emissions savings are abnormally high (more than 30% deviation from default values)"	
•	"Certification bodies must immediately inform the voluntary scheme of such	
•	Only values that have been verified and approved by auditors can be passed further in the supply chain. It is not allowed to alter individually	

Summary of changes made in version 4.1	Chapter
 calculated GHG emission values from incoming materials to random numbers for outgoing sustainability documentation. The System User must clearly communicate all relevant changes and additions made to the CB. Upon request from the European Commission or responsible national authorities ISCC will provide actual GHG emission calculations to the respective parties. For CCR and CCS production processes the applied allocation approaches must be clearly documented by the system user and verified by the auditor. 	
General:	Annex I
 Emission factors present in the IR have been removed Biograce values have been removed as no longer valid Emission factors from EcoInvent have been updated to newest version 	

1. Introduction

The purpose of the document "Greenhouse Gas Emissions" is to explain the options for stating greenhouse gas (GHG) emission values along the supply chain and to provide the methodology, rules and guidelines for calculating and verifying GHG emissions and emission reductions.

The ISCC requirements regarding GHG emissions apply to all relevant supply chain elements from raw material production to the distribution of the final product, including cultivation or extraction, all processing steps, and the transport and distribution of intermediate and final products.

2 Scope and Normative References

Following the requirements of the recast Renewable Energy Directive (2018/2001/EC) Article 31(1)-31(3), Annexes V and VI and Implementing Regulation on certification (IR¹), ISCC requires a minimum level of GHG savings for final biofuels, bioliquids and biomass fuels:

- at least 50% for biofuels, biogas consumed in the transport sector, and bioliquids produced in installations in operation on or before 5 October 2015
- at least 60% for biofuels, biogas consumed in the transport sector, and bioliquids produced in installations starting operation from 6 October 2015 until 31 December 2020
- at least 65% for biofuels, biogas consumed in the transport sector, and bioliquids produced in installations starting operation from 1 January 2021
- at least 70% for electricity, heating and cooling production from biomass fuels used in installations starting operation from 1 January 2021 until 31 December 2025, and 80% for installations starting operation from 1 January 2026
- The greenhouse gas emissions savings from the use of renewable liquid and gaseous transport fuels of non-biological origin shall be at least 70%

An installation shall be considered to be in operation once the physical production of biofuels, biogas consumed in the transport sector and bioliquids, and the physical production of heating and cooling and electricity from biomass fuels has started.

For the following elements in the supply chain, information on GHG emissions must be provided:

Relevant supply chain elements

a) Raw material production (extraction or cultivation)

Intention, Applicability. Legal background

GHG emission saving targets

¹ Specifically the Implementing Regulation on rules to verify sustainability and greenhouse gas emissions saving criteria and low indirect land-use change-risk criteria

- **b)** Processing units (companies that process raw materials/intermediate products and thereby change the physical or chemical properties of the input material)
- c) Transport and distribution

The requirements for the calculation of GHG emissions throughout the supply chain and the verification requirements for auditors are explained in this document. The document outlines the use of total and disaggregated default values and how the calculation of actual values is embedded in the ISCC system. Every chapter states the relevant requirements applicable to biofuels, bioliquids and biomass fuels.

Traders with/without storage do not need to calculate GHG emissions. Instead they must provide mode and distance of transportation on the Sustainability Declaration to the next supply chain element.

Depending on the type of fuel and the market in which it is consumed, different GHG calculation formulas apply:

Types of fuels

- > *biomass fuels* are gaseous and solid fuels produced from biomass
- > bioliquids are liquid fuels produced from biomass which are used for purposes other than transport, such as electricity generation and heating and cooling
- > biofuels are liquid fuels used for transport which are produced from biomass.

For RFNBOs ISCC provides a separate guidance document based on RED Article 25(2), Article 22 and COM DA referred to in Article 25(2).

The following global warming potentials apply: CO₂ =1, CH₄=28, N₂O=265



Figure 1: Overview of GHG calculation methodologies for different types of fuels and markets

Figure 1 provides an overview on when which of both GHG calculation methodologies needs to be applied. This depends on the market of the final fuel. Should be supplied in as well as the aggregate condition of the fuel. In the following chapters, "feedstock" is defined as the input material that is processed and hence can either be a raw material or an intermediate product, depending on the scope of the receiving entity.

As a basic principle, all relevant ISCC documents are valid for the scope of the application. The normative references display the documents to which the contents are linked and have to be considered.

3 Options for the provision of GHG information

The RED II² allows economic operators to calculate actual GHG emission values, to use total default values or to use a combination of disaggregated default values and calculated actual values.

Within ISCC there are different options for GHG information provision:

3.1. Use of total default values (TDV) OR

Use of disaggregated default values (DDV; which allow a combination of default values and actual values);

3.2. Use of actual values (individually calculated values).

Definition of feedstock

² Annex V and VI of RED II

Greenhouse gas emissions from the production and use of biofuels, bioliquids and solid biomass fuels shall be calculated as³ (for gaseous biomass fuels see section 3.2):

 $E = e_{ec} + e_{I} + e_{p} + e_{td} + e_{u} - e_{sca} - e_{ccs} - e_{ccr}$

where

- E total emissions from the use of the fuel,
- e_{ec} emissions from the extraction or cultivation of raw materials,
- e₁ annualised emissions from carbon stock changes caused by land-use change,
- *e_p emissions from processing,*
- *e*_{td} *emissions from transport and distribution,*
- *e_u emissions from the fuel in use,*
- e_{sca} emission savings from soil carbon accumulation via improved agricultural management,
- e_{ccs} emission savings from CO₂ capture and geological storage,
- eccr emission savings from CO₂ capture and replacement

Emissions from the manufacture of machinery and equipment shall not be taken into account.



Figure 2: Overview of options to forward GHG values

Figure 2 reflects four options for forwarding GHG information through certified supply chains. The following chapter explains the different approaches in more detail, including practical implications.

GHG calculation formula

³ Before conversion of bioliquids and biomass fuels into electricity or for heating/cooling, Annex V, C. Methodology, RED II

3.1 Use of default values

Total default values (TDV) and disaggregated default values (DDV) are provided by the RED II in Annex V and Annex VI⁴.

These default values reflect standardised biofuel, bioliquid and biomass fuel supply chains and processes, and are conservative estimates. Disaggregated default values are available for cultivation (e_{ec}), processing (e_p), and transport and distribution (e_{td}). Default values listed in Annex V and Annex VI can be applied only if the process technology and raw material used for the production of the biofuel match the respective scope of the default value. Certified economic operators can only use (disaggregated) default values if the following criteria are met:

- The TDV for GHG emission savings laid down in part A or B of Annex V and part A of Annex VI of the RED II can only be used if it reflects the production pathway, i.e. the raw material at the beginning of the supply chain and the process of the certified operator and e_I (emissions from land-use change) calculated according to chapter 4.3.2 of this document must equal to or less than zero. It is possible to use a combination of the DDV for cultivation and an individually calculated value for emissions from land-use change (e_I).
- > The TDV can only be used if the minimum level of GHG emission savings can be reached (see chapter 2), e.g. the total default value for palm oil biodiesel (with open effluent ponds) cannot be used, as the default GHG emission saving is only 20%.
- > The TDV for biodiesel (palm) can be applied for all palm (oil) derivatives as intermediate products.
- Transport of raw material from the farm to the first gathering point (FGP) is included in the DDV element 'emissions from cultivation' (e_{ec}). The same approach applies for NUTS2 values.
- > Typical values published in the RED II cannot be used for certification.

If the *TDV* is applied, certified economic operators up to the final processing unit do not provide actual numbers for the GHG value but state "Use of total default value" on their Sustainability Declarations. The producer of the biofuel/bioliquid/biomass fuel states the TDV as provided in RED II in g CO₂eq per MJ of biofuel, the GHG emission savings in % and the start date of biofuel operations on the final sustainability declaration (=proof of sustainability "PoS"). The information on GHG emissions can be reported as an aggregate.

Source of default values

Restrictions for the use of default values

Minimum level

Forwarding total default values

⁴ The Corrigendum to 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 published on 25 September 2020 provides updated default values for some pathways.

During the certification audit, the auditor needs to verify the suitability of the input material and process as well as the correct application of the TDV

System Users:

- Up to final processing unit: Statement "Use of TDV"
- Final processing unit:
 - RED II: TDV in gCO₂eq/MJ, GHG saving in %
 - Individual: start date of operation

Auditors:

- In compliance with crop and processing technology; transport distance for biomass fuels
- Reaching of GHG minimum saving requirement

Figure 3: Application of total default values

If an economic operator in the supply chain cannot use the total default value, e.g. because one of the criteria referred to in the above figure 3 is not fulfilled, it may be possible under certain conditions to use individual calculation or disaggregated default values.

The *DDVs* are only provided for emissions from cultivation (e_{ec}), processing (e_p) and transport and distribution (e_{td})⁵. Using these values provides the possibility to combine disaggregated default values with actual values from individual GHG calculations. One example would be to use the DDV for the incoming raw material and calculate an individual GHG value for emissions from processing at the operational unit (assuming that the entity is either the first processing unit or an actual GHG value for earlier processing steps has been received). Another option would be to combine an individual calculation for processing but apply the DDV for GHG emissions from transport & distribution. For transport and distribution it might be acceptable to use disaggregated default values for similar feedstocks if the transported goods can be transported in a similar way and the density is similar.

When using DDVs for one or more elements of the calculation formula, certified economic operators up to the final processing unit have to state "Use of disaggregated default value" on their Sustainability Declarations. Figure 4 below shows key points to take into account when dealing with DDVs.



Forwarding disaggregated default values



⁵ In sections D and E of Annex V, as well as Section C of Annex VI of the RED II different disaggregated default values for biofuels, bioliquids and biomass fuels are provided

In compliance with crop and processing technology; transport distance for biomass fuels Reaching of GHG minimum saving requirement Figure 4: Application of disaggregated default values Specific requirements for biomass fuels: The operator can only apply default values for the production of the biomass fuel if the feedstock used, process technology as well as the transport distance (for solid biomass used for electricity/heating/cooling markets) reflect the pathway given in RED II.

Where biomethane is used as compressed biomethane as a transport fuel, a value of 4.6 gCO_2q/MJ biomethane needs to be added to the default values included in RED II, Annex VI.

3.2 Use of actual values

Individually calculated GHG values or "actual values" are calculated based on the RED II methodology (according to the methodology laid down in part C of Annex V and as well as part B of Annex VI) as well as IR Article 20 and Annexes V, VII, IX, Commission Decision 2010/335/EU of 10 June 2010 (as amended under the RED II). For e_{ec} and e_{sca} specifically Annex V and VII of IR and ISCC's specifications as described in this document apply. Individual calculations of emissions must always be conducted at the point in the supply chain where they originate (e.g. emissions from cultivation can only be determined at the farm/plantation or the central office or the FGP of a group of farmers if all data is available there). It is not possible to calculate actual values retrospectively for elements of the upstream supply chain. For the calculation of "actual values" all relevant inputs of an economic operator must be considered.

Certified economic operators who conduct an individual GHG calculation must always state the GHG values calculated for raw materials and intermediate products in kg CO₂eq/dry-ton of output on Sustainability Declarations⁶. The RED II requires information on actual GHG emission values to be provided for all relevant elements of the GHG emission calculation formula. It is therefore required that e_{ec} , e_i , e_p , e_{td} , e_u , e_{sca} , e_{ccs} and e_{ccr} are reported separately. Figure

Individual calculation of GHG emissions



Forwarding actual values

⁶ Please see chapter 4.3.9 for specific requirements of final biofuel/bioliquid/biomass fuel producers

5 summarizes the methodology how to forward actual values in the supply chain.



Figure 5: Application of actual values

For agricultural production, Member States or the competent authorities in third countries may have submitted reports to the Commission including data on typical emissions from the cultivation of feedstocks calculated on a regional level (NUTS2 or NUTS2 consistent region for non-EU countries). As laid out under Article 31(2) of the RED II, values from the "NUTS 2" reports submitted to the Commission by the Member States in accordance with Regulation (EC) No 1059/2003 of the European Parliament and of the Council can be used as an alternative to actual values. Once the calculation of these values has been scrutinised by the Commission and approved by the EC through an Implementing Act, ISCC system users are allowed to apply these values provided they have been published in gCO2eq/kg of dry feedstock. It is possible to use either the respective GHG value for the specific NUTS2 region (or the region in the third country) from which the raw material originates or to use the highest emission value from the Member State's NUTS2 report (or the third country report) for specific raw material coming from that country. Only NUTS2 values or values from equivalent regions in third countries that had been subject to an IR can be applied. Furthermore, any values used under REDI are no longer valid due to differences in the GHG emission calculation methodology applied under the REDII methodology.

Companies (farmers or FGPs/Central offices) using the emission values for cultivation provided in Member State Reports must provide the specific value in kg CO₂eq/dry-ton of raw material on their Sustainability Declarations as available on the Commission website.

In the absence of relevant information on NUTS2 values in non-EU country reports⁷ or information on disaggregated default values for cultivation emissions of agricultural biomass in the RED II Annex V and VI, it is permitted to calculate averages based on local farming practices based on, for example, data from a group of farms, as an alternative to using actual values.



GHG values

Forwarding of NUTS2 values

Use of average GHG values

⁷ Reports referred to in the RED II Article, 31(4) or information on disaggregated default values for cultivation emissions in the RED II Annex V,
Estimates of emissions from cultivation and harvesting of forestry biomass may be derived from the use of averages for cultivation and harvesting emissions calculated for geographical areas at national level, as an alternative to using actual values. The methodology for calculating average GHG values can be the same as described in the chapter 4 "Requirements for individual GHG emission calculations". The data should be updated over time unless there is no significant variability in the data over time. For emissions from agrochemical use, the typical type and quantity of agrochemical product used for the raw material in the region concerned may be utilised. Emissions from the production of agrochemicals should either be based on measured values or on the technical specifications of the production facility. When the range of emissions values for a group⁸ of agrochemicals production facilities to which the facility concerned belongs is available, the most conservative emission number (highest) of that group shall be used. When a measured value for vields is used (as opposed to an aggregated value) for the calculations, a measured value for agrochemical input must also be used and vice versa.

A switch between different GHG information approaches is only possible if all relevant information and data can be verified by the auditor. Therefore, conducting an individual calculation for upstream processes at a later stage of the supply chain is not permitted, because the relevant input data would not be verifiable. Switching to a disaggregated default value or a total default value is possible as long as the relevant information has been delivered by certified economic operators and a default value is provided in the RED II.

Options other than those described are not accepted under the RED II. All deliveries, including those from other recognised voluntary certification schemes, must comply with these requirements, otherwise they cannot be accepted.

Specific requirements for biomass fuels:

RED II, Annex VI. Part B. point 1 (b) and (c) outlines the methodology market operators must apply in the case of co-digestion of different (n) substrates in a biogas plant for the production of electricity or biomethane. They shall be calculated as a sum, taking into account the relative shares of the respective inputs and their emission factors. Therefore, the GHG value must be calculated as a single value for the whole amount of the biogas / biomethane, resulting from the co-digestion.

The formula for actual greenhouse gas emissions of biogas and biomethane is as follows:

Calculation and data

Switching GHG information

Other recognised certification schemes

⁸ It refers to for example a situation where an economic operator knows that a certain company in a certain country produced the fertiliser. That company has a number of fertiliser production facilities in that country for which the range of processing emissions are known; an economic operator can claim the most conservative number of emissions from those group of fertiliser production facilities.

$$E = \sum_{l}^{n} S_n \cdot (e_{ec,n} + e_{td,feedstock,n} + e_{l,n} - e_{sca,n}) + e_p + e_{td,product} + e_u - e_{ccs} - e_{ccr}$$

where

E	 total emissions from the production of the biogas or biomethane before energy conversion; 						
S _n	= Share of feedstock n, as a fraction of input to digester (*);						
e _{ec,n}	= emissions from the extraction or cultivation of feedstock n;						
e _{td,feedstock,n}	= emissions from transport of feedstock n to the digester;						
e _{l,n}	= annualised emissions from carbon stock changes caused by land-use change, for feedstock n;						
e _{sca}	= emission savings from improved agricultural management of feedstock n (**);						
e_p	= emissions from processing;						
e _{td,product}	= emissions from transport and distribution of biogas and/or biomethane;						
e _u	= emissions from the fuel in use, that is greenhouse gases emitted during combustion						
e _{ccs}	= emission saving from CO_2 capture and geological storage;						
e _{ccr}	= emission savings from CO_2 capture and replacement						

(*) For detailed Information on the Sn factor, see REDII, Annex VI, Part B. (**) For e^{sca} a bonus of 45 g CO₂eq/MJ manure shall be attributed for improved agricultural and manure management in the case animal manure is used as a substrate for the production of biogas and biomethane.

Emissions from the manufacture of machinery and equipment shall not be taken into account.

Specific requirements for bioliquids and biomass fuels:

Greenhouse gas emissions from the production and use of **bioliquids** shall be calculated in the same way as for biofuels (E), but with an extension necessary for including the energy conversion to electricity and/or for use for heating and cooling. Hence, energy installations using bioliquids to deliver only heat, only electricity, or (useful) heat together with electricity and/or mechanical energy need to apply the methodology provided in the RED II, Annex V, C. Methodology, point b in addition to the formula stated above (E). Energy installations delivering heat/electricity

GHG calculation methodology for biomass fuels

Greenhouse gas emissions from the use of **biomass fuels** for producing electricity, or used for heating and cooling, including the energy conversion to

electricity and/or for use for heating or cooling shall be calculated according to the methodology as provided in the RED II, Annex VI, B. Methodology, point d.

For energy installations delivering **only heat**:

$$EC_h = \frac{E}{\eta_h}$$

For energy installations delivering only electricity:

$$EC_{el} = \frac{E}{\eta_{el}}$$

For the electricity or mechanical energy coming from energy installations delivering useful heat together with electricity and/or mechanical energy:

$$EC_{el} = \frac{E}{\eta_{el}} \left(\frac{C_{el} \cdot \eta_{el}}{C_{el} \cdot \eta_{el} + C_h \cdot \eta_h} \right)$$

For the useful heat coming from energy installations delivering heat together with electricity and/or mechanical energy:

$$EC_h = \frac{E}{\eta_h} \left(\frac{C_h \cdot \eta_h}{C_{el} \cdot \eta_{el} + C_h \cdot \eta_h} \right)$$

where:

EC _{h,el}	= Total greenhouse gas emissions from the final energy commodity
Ε	= Total greenhouse gas emissions of the fuel before end- conversion
η _{el}	 The electrical efficiency, defined as the annual electricity produced divided by the annual energy input, based on its energy content
η _h	= The heat efficiency, defined as the annual useful heat output divided by the annual energy input, based on its energy content
C _{el}	= Fraction of exergy in the electricity, and/or mechanical energy, set to 100 % (C_{el} = 1)
C _h	= Carnot efficiency (fraction of exergy in the useful heat)
-	

The Carnot efficiency, C_h , for useful heat at different temperatures is defined as:

$$C_h = \frac{T_h - T_0}{T_h}$$

where:

- T_h = Temperature, measured in absolute temperature (kelvin) of the useful heat at point of delivery
- T₀ = Temperature of surroundings, set at 273,15 kelvin (equal to 0 °C)

If the excess heat is exported for heating of buildings, at a temperature below 150 °C (423,15 kelvin), C_h can alternatively be defined as follows:

 C_h = Carnot efficiency in heat at 150 °C (423,15 kelvin), which is: 0,3546

For the purposes of that calculation, the following definitions apply.

- *cogeneration* shall mean the simultaneous generation in one process of thermal energy and electricity and / or mechanical energy;
- *useful heat* shall mean heat generated to satisfy an economical justifiable demand for heat, for heating or cooling purposes;
- economical justifiable demand shall mean the demand that does not exceed the needs for heat or cooling, and which would otherwise be satisfied at market conditions.

4 Requirements for individual GHG emission calculation

The following chapters describe how an individual calculation shall be conducted in the different steps of the supply chain. Chapter 4.1 describes the general requirements for data gathering and the type of data to be used in an individual calculation. Chapter 4.2 defines the relevant supply chain elements for an individual GHG calculation. In chapter 4.3 the calculation methodologies for the following elements are introduced in detail:

- 4.3.1: Emissions from the extraction or cultivation of raw materials $(e_{\rm ec})$
- 4.3.2: Emissions from carbon stock changes caused by land-use change (e_l)
- 4.3.3: Emission saving from soil carbon accumulation via improved agricultural management (e_{sca})
- 4.3.4: Emissions from transport and distribution (etd)
- 4.3.5: Emissions from processing (e_p)
- 4.3.6: Emission savings from CO₂ capture and replacement (e_{ccr}) and CO₂ capture and geological storage (e_{ccs})

- 4.3.7: Adjusting incoming emission values
- 4.3.8: Allocation of emissions to main products and co-products
- 4.3.9: Further requirements for the producers of final biofuels, bioliquids and biomass fuels

4.1 Data gathering

The GHG calculation methodology for individual calculations differentiates between the different elements in the supply chains, i.e. between agricultural producers (cultivation) and processing units. The calculation formula consists of actual data gathered from the individual (to be) certified company and data gathered from databases and literature.

Certification audit data gathering is relevant for actual input data, e.g. electricity or heat consumption, chemicals or fertilisers and for output data like wastewater production. Actual data measured and gathered at the system user must be documented and provided to the auditor for the verification. This can include field record systems, production reports, production information systems, delivery notes, weighbridge protocols, contracts, invoices and others. The calculation period should cover a full twelve-month period (in case of agricultural crops the growing season must be included). It must be as up to date as possible. As an alternative, it must cover the previous calendar or financial year. In cases of exceptional maintenance measures and unstable production conditions a shorter period (for inputs and respective outputs) may be considered if it better reflects the relevant timeframe. This can also be the case if within one year two crops are cultivated of which only one is unambiguously supplied in the biofuel sector. The respective period for data gathering and thus for the calculation of GHG emissions must be transparently displayed in the calculation. If, at the initial certification audit, no actual data is available (i.e. at the beginning of the production), "design data" can be used to conduct the individual calculation. Six months after the date of certificate issuance, certified economic operators must prove to their Certification Bodies that the values based on design data are appropriate. In case of deviations, new actual GHG values must be calculated, verified and used. After one year, the company has to switch from design data to actual data. This change is subject to the general recertification audit.

If an input has little or no effect for the emission element of the calculation formula, it can be excluded from the emission calculation. Inputs with little or no effect are those that have an impact on the overall emissions of the respective calculation formula element (e.g. cultivation e_{ec}) that is lower than 0.5%.

Published data includes the emission factors (EF), with which the respective input data are multiplied, and lower heating values. These have to be gathered from official sources. Whenever available, the standard values published in Annex IX of the IR 2022/996 shall be used. Alternative values may be used but must be duly justified and flagged in the calculation documentation in order

Audit data gathering for individual calculation

Inputs with little or no effect

Data sources for EF and LHVs to facilitate verification by auditors. They can be based on LCA Databases such as Ecoinvent or individually calculated or measured (e.g. LHV could be measured through laboratory analyses) as long as the methodology for the GHG calculation complies with the methodology set in the RED II and is verifiable during the audit or the supplier of the EF/LHV is ISCC/ISO certified. If not available, other scientifically peer-reviewed literature or official statistical data from government bodies can be used. All data gathered from databases or literature shall be based on the most recent available sources and shall be updated over time. The source and the date of data collection shall be documented. EFs chosen or calculated shall also reflect the specific situation and set-up, e.g. if a process-specific input was produced in Europe then the EF for this input shall also reflect the European situation. It is the responsibility of the CB to confirm that a given EF can be used by the System User.

4.2 Supply chain elements

An individual GHG emission calculation is not performed for the whole supply chain but only within the system boundary of a certified supply chain element. The following figure shows the supply chain elements responsible for calculating the individual elements of the calculation formula. Figure 6 shows at which step in the supply chain what kind of emissions can arise at the example of an agricultural supply chain:

- For agricultural supply chains the minimum requirements to be forwarded up to the final biofuel processor are e_{ec}, e_l (in case emissions from land use change in compliance with ISCC requirements took place), e_p and e_{td}
- > For waste/residue supply chains the minimum requirements to be forwarded up to the final biofuel processor are ep and etd
- > e_{sca}, e_{ccr} and e_{ccs} are voluntary additional savings and can only be forwarded if they are actually implemented and verified at the respective supply chain element

System boundaries



Figure 6: Relevant supply chain elements for an individual calculation for biofuels of the different elements of the calculation formula in an agricultural supply chain

Actual values of emissions from the extraction or cultivation of raw materials e_{ec} can only be determined at the origin of the chain of custody on the farm/ plantation level and for forestry biomass at the forest sourcing area level. Farmers and agricultural producers or FGPs/groups' central offices (on behalf of the farmers belonging to the group) can conduct an individual GHG emission calculation for eec. If, additionally, land-use change (e) has occured (that did not violate ISCC Principle I) or improved agricultural management (e_{sca}) is applied, these emissions (or savings in the case of e_{sca}) also need to be calculated at this step. If farms or plantations belong to a group, they can either conduct an individual GHG emission calculation for each farmer or one GHG emission calculation for the whole group. As highlighted in the EC Communication 2010/C160/01, group certification for the purpose of calculating GHG emissions is acceptable if the units have similar production systems and products.⁹ The data basis for an individual calculation of a group is based on a sample of relevant individual input data. Data is gathered from the square root of all farms/plantations belonging to a group. The data gathering samples must take into account the different crops cultivated, regional specifics and the size of the individual farms. Sampling for the purpose of individual calculations must also be risk-based. This means that farms applying an individual calculation for GHG emissions need to be represented accordingly in the sample. The highest GHG emission value can be used for the whole group. Using the average of different GHG emission values is not permitted.

If during the validity of a certificate and prior recertification:

> further farmers are added to the supply base, the already calculated highest actual value can be used for the complete supply base. It is the responsibility of the FGP in the framework of the self assessment and internal audit to ensure that individual calculations comply with Individual calculation for cultivation

⁹ For all requirements on on group certification see ISCC EU System Document 203 "Traceability and Chain of Custody"

ISCC requirements. Samples of the individual calculations need to be verified latest in the upcoming recertification audit. The CB is responsible to choose farmers that become part of this sample (for more guidance please see the requirements as outlined in ISCC EU System Documents 203 "Traceability and Chain of Custody" and 204 "Risk Management").

- > farmers would like to switch from a group certification setup the highest value is applied for all farmers to individual farm calculations it is the responsibility of the CB to decide if a respective switch can be allowed (i.e. because relevant GHG documentation is established, clear and traceable). It is the responsibility of the CB to decide if an on-site visit is necessary to verify compliance with ISCC requirements.
- > in case all group members use the default value and would like to switch to an actual calculation, relevant requirements for group certification of this chapter need to be applied.
- > any changes in the GHG methodology must be clearly documented by the economic operator and must be reported to the certification body before the adjustment.

Above stated adaptions should be reflected in the risk assessment of the System User and the CB, i.e. potentially leading to a higher risk in the next audit.

If the certified economic operator is a processing unit, the emissions from processing (e_p) may be calculated. Actual values of emissions from processing can only be determined if emissions from all processing steps are recorded and transmitted through the chain of custody. During this step further emission savings such as CO₂ capture and geological storage (e_{ccs}) or CO₂ capture and replacement (e_{ccr}) are calculated if applicable.

Actual values of emissions from transport and distribution (e_{td}) can only be determined if emissions from all transport steps are recorded and transmitted through the chain of custody. Any recipient of physical material has to determine the upstream transport emissions (e_{td}) and has to transmit these values to the recipient of the material. The final processing unit also has to determine the downstream transport and distribution emissions to the final market.

The emissions of depots and filling stations may be calculated using the data provided by the JRC¹⁰. The provided values (depot: 0,00084 MJ/MJ fuel, filling station: 0,0034 MJ/MJ fuel) must be multiplied by the appropriate national electricity EF from the Implementing Regulation (EU) 2022/996.

All elements need to provide emissions in kgCO₂eq/dry-ton throughout the supply chain up to the final biofuel producer. Therefore, the emissions are

Individual calculation for processing units

> Individual calculation for transport

¹⁰ European Commission, Joint Research Centre, Padella, M., O'Connell, A., Giuntoli, J. et al., Definition of input data to assess GHG default emissions from biofuels in EU legislation – Version 1d - 2019, Publications Office, 2019, https://data.europa.eu/doi/10.2760/69179

either divided by the amount of dry feedstock or they are calculated by applying a moisture factor:

 $e_{feedstock} \left[\frac{kg \ CO_2 eq}{ton_{dry}} \right] = \frac{e_{feedstock} \left[\frac{kg \ CO_2 eq}{ton_{moist}} \right]}{(1 - moisture \ content)}$

The moisture content should be the value measured after delivery, or, if this is not known, the maximum value allowed by the delivery contract. The moisture contents of suppliers and recipients of sustainable material need to be consistent (e.g. between a farm/plantation and oil mill). If this is not measured after delivery, industry-wide accepted values e.g. derived from scientific databases can be applied as an alternative.

If at any point of the chain of custody emissions have occurred and are not recorded, so that the calculation of an actual value is no longer feasible for operators downstream in the chain of custody, this must be clearly indicated in the Sustainability Declarations.

4.3 Calculation methodology

4.3.1 Emissions from the extraction or cultivation of raw materials (e_{ec})

Emissions from the extraction or cultivation of raw materials apply to all agricultural raw materials, such as rapeseed/canola, palm, soybean, wheat, corn/maize and sugarcane. If wastes or residues (e.g. straw, crude glycerine) are used as a raw material in a process, the GHG emissions of extraction or cultivation of the raw material are considered to be zero and emissions at the point of origin of the waste or residue are zero.

4.3.1.1 Calculation formula for extraction or cultivation of raw materials

The GHG emission formula for extraction or cultivation of raw materials e_{ec} includes all emissions (EM) from the extraction or cultivation process itself; including emissions from the collection, drying and storage of raw materials, from waste and leakages, and from the production of chemicals or products used in extraction or cultivation. The capture of CO₂ in the cultivation of raw materials is excluded:

$$e_{ec}\left[\frac{kg\ CO_{2}eq}{ton}\right] = \frac{\left(EM_{fertiliser} + EM_{N20} + EM_{inputs} + EM_{fuel} + EM_{electricity}\right)\left[\frac{kg\ CO_{2}eq}{ha * yr}\right]}{yield\ raw\ material\ \left[\frac{ton}{ha * yr}\right]}$$

The sum of GHG emissions from fertilisers, further inputs like plant protection *Division by yield* products^{11,} seeding material, fuel diesel and electricity (EM, here in kg CO₂eq per ha and year) is divided by the yield of raw material in tons per ha and year in order to receive the specific GHG emission per ton of raw material. For all

Applicability of eec

Sum of emissions from cultivation or extraction

¹¹ Plant protection product or pesticide includes herbicides, insecticides, fungicides, etc.

types of raw materials, the yield shall refer to the dry matter content. If not calculated per dry ton directly a correction is required (please find the formula in chapter 4.2).

The emissions of the different inputs (EM) are calculated by multiplying the input data with the respective EFs. Care must be taken that units of on-site gathered data and data used from recognised sources are the same.

 $EM_{fuel} = fuel \ consumption \ \left[\frac{l}{ha * yr}\right] * EF_{fuel} \left[\frac{kg \ CO_2 eq}{l}\right]$

For calculating fuel emissions from the use of farm machinery (EM_{fuel}) the fuel consumption of all activities during field-preparation, seeding, fertiliser and pesticide application, harvesting and collection must be determined, documented and multiplied with the EF for the respective fuel type e.g. diesel, gasoline, heavy fuel oil, biofuels. Emissions from the collection of raw materials include also transport to storage (this includes transport to and storage at the FGP). Appropriate EFs to be used can be found in Annex IX of the IR. Where biofuels are used, the default GHG emissions set out in RED II must be used.

The cultivation emissions shall include emissions from drying before storage as well as from storage and handling of biomass feedstock. Data on energy use for drying before storage shall include actual data on the drying process used to comply with the requirements of storage, depending on the biomass type, particle size, moisture content, weather conditions, etc. Appropriate emission factors, including upstream emissions, shall be used to account for the emissions from the use of fuels to produce heat or electricity used for drying. Emissions for drying include only emissions for the drying process needed to ensure adequate storage of raw materials and does not include drying of materials during processing.

$$EM_{electricity} = electricity \ consumption \ \left[\frac{kWh}{ha * yr}\right] * EF_{electricity} \ \left[\frac{kg \ CO_2 eq}{kWh}\right]$$

For **electricity** used in farming operations the emission intensity shall be that of a defined region, which can be at a NUTS2 region (if available and recognized by the European Commission) or a national level. In case national electricity emission coefficients are used, the values from Annex IX of the IR shall be used. The producer may also use an average value for an individual electricity production plant for electricity produced by that plant if it is not connected to the electricity grid and sufficient information are available to derive an emission factor. Emissions of

(EM)

EMfuel

individual inputs

EMelectricity

 $EM_{input} = input \left[\frac{kg}{ha * yr} \right] * EF_{input} \left[\frac{kg CO_2 eq}{kg} \right]$

EM_{input} refers to for example seeding material (seeds or seedlings) and all types of plant protection products.

The calculation of emissions from **seeding material** production shall be based on actual data on the seeding material used. If EFs are being used to account for the emissions from production and supply of the seeding material the standard values set out in Annex IX of the IR must be used. If the appropriate EF for the respective seeding material cannot be found, literature values from the following hierarchy must be used:

- > version 5 of JEC-WTW report,
- > Ecolnvent database,
- "official" sources, such as Intergovernmental Panel on Climate Change (IPCC), International Energy Agency (IEA) or governments,
- Other reviewed sources of data, such as E3 database, GEMIS database,
- > Peer-reviewed publications.
- > Duly documented own estimates.

For **plant protection products** the unit for EM_{input} is always kg active ingredient of the used pesticide.

 $EM_{fertiliser} = fertiliser input \left[\frac{kg \ nutrient}{ha * yr}\right] * EF_{production} \left[\frac{kg \ CO_2 eq}{kg \ nutrient}\right]$

The amount of fertiliser used always refers to the main nutrient/active *EMtertiliser* ingredient (e.g. nitrogen).

- For synthetic fertilisers (e.g. P₂O₅, K₂O, CaO) EF_{production} is relevant and must be applied.
- For *synthetic nitrogen fertilisers*, in addition to EF_{production}, N₂O-field emissions have to be calculated.

For *nitrogen fertilisers*, next to on-field N₂O emissions also emissions from the neutralisation of fertiliser acidification in the soil have to be included based on the amount used. For nitrate fertilisers, the emissions from neutralisation shall be 0.783 kg CO₂/kg N; for urea fertilisers, the neutralisation emissions shall be 0.806 kg CO₂/kg N.

If *agricultural lime (aglime)* is used and applied on the field additional soil emissions from liming shall be accounted for.

EMinput

Emissions from pesticides

For synthetic nitrogen fertilisers, in addition to $EF_{production}$, N₂O-field emissions have to be calculated. For organic nitrogen fertilisers and crop residues left on the field N₂O-field emissions must be calculated as well.

The IPCC methodology shall be applied to ensure that N_2O emissions from managed soils are taken into account, including what are described as both "direct" and "indirect" N_2O emissions of synthetic and organic nitrogen fertilisers and crop residues.¹²

 $N_2 O_{Total} - N = [N_2 O_{Direct} - N + N_2 O_{Indirect} - N]$

For mineral soils, direct N₂O emissions shall be calculated as:

 $N_2 O_{Direct} - N = [(F_{SN} + F_{ON}) * EF_1] + [F_{CR} * EF_1]$

While for organic soils the formula to be applied is as follows:

 $N_2 O_{Direct} - N = [(F_{SN} + F_{ON}) * EF_1] + [F_{CR} * EF_1] + [F_{OS,CG,Temp} * EF_{2CG,Temp}] + [F_{OS,CG,Trop} * EF_{2CG,Trop}]$

For both mineral and organic soils, the calculation of indirect N_2O emissions shall follow the following equation:

$$N_2 O_{Indirect} - N = [(F_{SN} * Frac_{GASF}) + (F_{ON} * Frac_{GASM})] * EF_4] + [(F_{SN} + F_{ON} + F_{CR}) * Frac_{Leach-(H)} * EF_5]$$

Where:

Direct and Indirect annual N2O-N emissions produced from $N_2 O_{Total} - N$ managed soils, kg N₂O-N ha⁻¹ a⁻¹ $N_2O_{Direct} - N$ Annual direct N₂O-N emissions produced from managed soils, kg N₂O-N ha⁻¹ a⁻¹ $N_2O_{Indirect}$ – N Annual indirect N₂O-N emissions, (that is to say, the annual amount of N2O-N produced from atmospheric deposition of N volatilised from managed soils and annual amount of N2O-N produced from leaching and run-off of N additions to managed soils in regions where leaching/run-off occurs), kg N₂O-N ha⁻¹ a⁻¹ Annual synthetic nitrogen fertilizer input, kg N ha⁻¹ a⁻¹ F_{SN} Total organic N-fertilizer input, kg N ha⁻¹ a⁻¹ F_{ON} Total crop residues N-input, kg N ha⁻¹ a⁻¹ F_{CR} Annual area of managed/drained organinc soils under cropland F_{OS,CG,Temp} in temperate climate, ha-1 a-1 Annual area of managed/drained organinc soils under cropland F_{OS.CG.Trop} in tropical climate, ha-1 a-1

N₂O-field

emissions

¹² IPCC guidelines for National Greenhouse Gas Inventories, Volume 4, Chapter 11, <u>http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/4 Volume4/V4 11 Ch11 N2O&CO2.pdf</u> and "2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories"

<i>Frac</i> _{GASF}	0,10 (kg N volatilised) (kg of N applied) ⁻¹ . Fraction of applied synthetic N fertiliser that volatilises as NH_3 and NO_x ,				
<i>Frac_{GASM}</i>	0,20 (kg N volatilised) (kg of N applied or deposited) ⁻¹ . Fraction of applied organic N fertiliser that volatilises as NH_3 and NO_x .				
Frac _{LEACH-(H)}	0,30 (kg N) (kg of N additions) ⁻¹ . Fraction of all N added to/mineralised in managed soils in regions where leaching/runoff occurs that is lost through leaching and runoff,				
EF ₁	$0,01~(kg~N_2O\text{-}N)~(kg~N~input)^{-1}.$ Emission factor for $N_2O~$ emissions from N inputs				
EF _{2CG,Temp}	${f 8}$ kg N ha ⁻¹ a ⁻¹ for temperate organic crop and grassland soils				
EF _{2CG,Trop}	16 kg N ha ⁻¹ a ⁻¹ for tropical organic crop and grassland soils				
EF ₄	0,01 (kg N ₂ O-N) (kg NH ₃ –N + NO _x –N volatilised) ^{-1.} Emission factor for N ₂ O emissions from atmospheric deposition of N on soils and water surfaces				
EF ₅	0,0075 (kg N ₂ O–N) (kg N leached and runoff) ⁻¹ . Emission factor for N ₂ O emissions from N leaching and runoff				

Economic operators shall use disaggregated crop-specific emission factors for different environmental conditions (corresponding to Tier 2 of the IPCC methodology) to calculate the N₂O emissions resulting from crop cultivation. Economic operators shall use crop and site-specific emission factors for the calculation of N₂O emissions from synthetic and organic fertilizers application (EF₁ of the above equation). N₂O emissions from soils under agricultural use, in different agricultural fields under different environmental conditions and agricultural land use classes can be determined following the statistical model developed by Stehfest and Bouwman (2006) ('the S&B model'). The crop- and site- specific emission factor calculated, according to the S&B model (EF1ij), can be used to substitute the IPCC EF_1 factor in the calculation of direct N_2O emissions from fertilizer input.

The EF1_{ii} for the crop i at location j is calculated, according to the S&B model as:

$$EF_{1ij} = \left[\left(E_{fert,ij} - E_{unfert,ij} \right) / N_{appl,ij} \right]$$

Where:

E _{fert,ij}	N_2O emission, based on S&B, where fertilizer input is the actual			
	application rate (mineral fertilizer and manure) to the crop i at			
	location j (kg N ₂ O-N ha ⁻¹ a ⁻¹)			
E _{unfert,ij}	N_2O emission of the crop i at location j (kg N_2O -N ha ⁻¹ a ⁻¹), based			
	on S&B. The N application is set to 0 and all the other			
	parameters are kept the same			

Crop- and sitespecific emission factor $N_{appl,ij}$ N input from mineral fertiliser and manure (kg N ha⁻¹ a⁻¹) to the crop i at location j

 $E_{fert,ij}$ and $E_{unfert,ij}$ are calculated through the basic formula of the S&B model which combines the effect of different drivers such as soil organic content, pH, soil texture, climate and vegetation and N input, in the following equation:

$$E = exp\left(-1.516 + \sum ev\right)$$

Where:

E annual N₂O emission (kg N₂O-N ha⁻¹ a⁻¹)

- 1.516 constant value

ev effect value for different drivers (i.e. (Table 1)

Table 1 should be used to derive the effect value according to the specific crop and site conditions of crop i grown at location j.

Constant value	-1.516						
arameter Parameter class or unit		Effect value (ev)					
Fertilizer input		0.0038 * N application rate in kg N ha ⁻¹ a ⁻¹					
Soil organic C content	<1%	0					
	1-3 %	0.0526					
	>3 %	0.6334					
pH	<5.5	0					
	5.5-7.3	-0.0693					
	>7.3	-0.4836					
Soil texture	Coarse	0					
	Medium	-0.1528					
	Fine	0.4312					
Climate	Subtropical climate	0.6117					
	Temperate continental climate	0					
	Temperate oceanic climate	0.0226					
	Tropical climate	-0.3022					
Vegetation	Cereals	0					
	Grass	-0.3502					
	Legume	0.3783					
	None	0.5870					
	Other	0.4420					
	Wetland rice	-0.8850					
Length of experiment	1 yr	1.9910					

Table 1 – Constant and effect values for the S&B model

The nitrogen input provided to the soil with the crop residues left on the field, shall also be taken into account as a contribution to N_2O emissions from managed soils. The crop residues N input shall be calculated as follows:

Crop residues N input

For sugar beet and sugar cane, N input should be calculated not considering below-ground residues and with the addition of input from vignasse and filter cake respectively. This is done, through the following formula, in accordance with IPCC (2006) Vol. 4 Chapter 11, Eq. 11.6:

$$F_{CR} = Yield * DRY * (1 - Frac_{Burnt} * C_f) * [R_{AG} * N_{AG} * (1 - Frac_{Remove})] + F_{VF}$$

For coconut and oil palm plantations a fixed N input is applied based on literature, because the IPCC (2006) provides no default calculation method for standard emission factors, pursuant to Annex IX of the IA.

For all the other crops, calculations should be done, according to IPCC (2006) Vol. 4 Chapter 11 Eq. 11.7a, 11, 12, as:

 $F_{CR} = (1 - Frac_{Burnt} * C_f) * AG_{DM} * N_{AG} * (1 - Frac_{Remove}) + (AG_{DM} + Y * DRY) * R_{BG-BIO} * N_{BG}$

Where:

 F_{CR} Amount of N in crop residues (kg N ha⁻¹ yr¹)

Yield Annual fresh yield of the crop (kg ha⁻¹)

DRY Dry matter fraction of harvested product [kg d.m. (kg fresh weight)⁻¹] (table 2)

Frac_{Burnt} Faction of crop area burnt annually [ha (ha)⁻1]

C_f Combustion factor [dimensionless] (table 2)

R_{AG} Ration of above-ground residues, dry matterto harvested dry matter yield, for the crop [kg d.m. (kg d.m.)⁻¹] (table 2)

N_{AG} N content of above-ground residues [kg N (kg d.m.)-1] (table 2)

 $Frac_{Remove}$ Fraction of above-ground residues removed from field [kg d.m. (kg AG_{DM})⁻¹] (table 2)

 F_{VF} Annual amount of N in sugar cane vignasse and filter cake returned to the field kg N ha⁻¹

AG

Above-ground residues dry matter (kg d.m. ha⁻¹)

Crop	Calculation method	DRY	лнл	Nas	slope	intercept	Receipto	Nea	α	Ras	Fixed amount of N in crop residues (kg N ha ⁻¹)	Data sources*
Barley	IPCC (2006) Vol. 4 Ch. 11 Eq. 11.7a	0.865	17	0.007	0.98	0.59	0.22	0.014	0.8			1, 2
Cassava	IPCC (2006) Vol. 4 Ch. 11 Eq. 11.7a	0.302	16.15	0.019	0.1	1.06	0.2	0.014	0.8			1, 2
Coconuts	Fixed N from crop residues	0.94	32.07								44	1, 3
Cotton	No inform. on crop residues	0.91	22.64									
Maize	IPCC (2006) Vol. 4 Ch. 11 Eq. 11.7a	0.86	17.3	0.006	1.03	0.61	0.22	0.007	0.8			1, 2
Oil palm fruit	Fixed N from crop residues	0.66	24								159	1, 4
Rapeseed	IPCC (2006) Vol. 4 Ch. 11 Eq. 11.7a	0.91	26.976	0.011	1.5	0	0.19	0.017	0.8			1, 5
Rye	IPCC (2006) Vol. 4 Ch. 11 Eq. 11.7a	0.86	17.1	0.005	1.09	0.88	0.22	0.011	0.8			1,6
Safflower seed	No inform.on crop residues	0.91	25.9									
Sorghum (grain)	IPCC (2006) Vol. 4 Ch. 11 Eq. 11.7a	0.89	17.3	0.007	0.88	1.33	0.22	0.006	0.8			1, 7
Soybeans	IPCC (2006) Vol. 4 Ch. 11 Eq. 11.7a	0.87	23	0.008	0.93	1.35	0.19	0.087	0.8			1, 8
Sugar beets	IPCC (2006) Vol. 4 Ch. 11 Eq. 11.6	0.25	16.3	0.004					0.8	0.5		1, 9
Sugar cane	IPCC (2006) Vol. 4 Ch. 11 Eq. 11.6	0.275	19.6	0.004					0.8	0.43		1, 10
Sunflower seed	IPCC (2006) Vol. 4 Ch. 11 Eq. 11.7a	0.9	26.4	0.007	2.1	0	0.22	0.007	0.8			1, 11
Triticale	IPCC (2006) Vol. 4 Ch. 11 Eq. 11.7a	0.86	16.9	0.006	1.09	0.88	0.22	0.009	0.8			1, 2
Wheat	IPCC (2006) Vol. 4 Ch. 11 Eq. 11.7a	0.84	17	0.006	1.51	0.52	0.24	0.009	0.9			1, 2

Table 2 – Crop-specific parameters to calculate N input from crop residues

Finally, the results of the calculation of N_2O emission from managed soil shall be converted from $N_2O - N$ to N_2O according to the following equation:

$$N_2 O = N_2 O - N * 44/28$$

As stated in the Implementing Regulation (EU) 2022/996, 1 g N_2O is equal to 265 g CO_2 eq for the purposes of calculating CO_2 equivalence.

The real amount of aglime used shall be duly documented and emissions from its application calculated as follows:

- > On acid soils, where pH is less than 6.4, a factor of 0.44 kg CO₂/ kg CaCO₃ equivalent aglime shall be used.
- If soil pH is greater or equal to 6.4, an EF of 0.079 kg CO₂/ kg (CaCO₃ equivalent) aglime shall be used in addition to the emissions due to the neutralisation of fertilizer acidity.
- If the liming emissions calculated in (1) and (2) are greater than the fertilizer neutralization emissions, the latter may be subtracted from the calculated liming emissions to avoid double counting.
- If the fertilizer neutralization emissions exceed those attributed to liming, the net liming emissions shall be counted zero to avoid negative emissions. However, emissions from fertilizer neutralization shall be maintained.

If no data is available on actual aglime use, the amount recommended by the Agricultural Lime Association shall be assumed and reflect the crop type, measured soil pH, soil type and type of lime material. Respective CO_2 emissions shall be calculated based on step (1) and (2) above. However, the subtraction specified in point 3 shall not be applied in this case, since the recommended use of aglime does not include aglime used to neutralize fertilizer applied in the same year, so there is no possible double counting of fertilizer neutralization emissions.

The EFs for both chemical fertilisers and pesticides shall include all related emissions from the manufacture of those pursuant to Annex IX of the IR. For fertilisers also transport emissions shall be included, using the emissions from transport modes listed in Annex IX of the IA.

- If the economic operator knows the factory producing the fertiliser and it falls under the EU Emissions Trading System (ETS), then the economic operator can use the production emissions declared under ETS, adding the upstream emissions for natural gas etc. Transport of the fertilizers shall also be included, using the emissions from transport modes listed in Annex IX of the IR
- If the economic operator does not know the factory supplying the fertiliser, it should use the standard values provided for in Annex IX of the IR

Soil emissions from liming (aglime)

EFs production

N₂O-N to N₂O conversion When calculating GHG emissions on cultivation level emissions from replanting activities and from activities on immature areas must also be taken into account.

4.3.1.2 Data basis

On-site data gathering

The following data for the calculation of GHG emissions from cultivation must be gathered on-site. They will form the basis for the calculation of GHG emissions for an individual crop. All input values must be gathered for the same reference area and time period. In the example below the time period of 1 year (yr) and the reference area of 1 hectare (ha) are used.

- > Amount of seeding material in kg per ha and yr
- > Amount of plant protection products (PPP) in kg active ingredient per ha and year (e.g. kg glyphosate/(ha*yr))
- > Amount of synthetic fertilisers: phosphorus (P₂O₅), potassium (K₂O), lime (CaO), and nitrogen (N) fertiliser in kg nutrient per ha and year (e.g. kg nitrogen/(ha*yr))
- > Amount of organic nitrogen (N) fertilisers in kg N/(ha*yr)
- > Amount of aglime in kg aglime (CaCo₃)
- > Amount of crop residues in kg N /(ha*yr)
- > For the calculation of N₂O-field emissions specifically:
 - Amount of N₂O-N produced from atmospheric deposition of N (ATD)
 - Amount N₂O-N produced from leaching, runoff of N (L)
- > Diesel consumption, electricity consumption and other energy consumption (for any work related to the cultivation, collection and drying of biomass).
- > If biomass is dried and stored in an external warehouse, these emissions also need to be taken into account.
- > Transportation mode and distance up to the FGP
- > Yield of the raw material in ton/(ha*yr) moist and moisture content to determine yield of dry matter. If moisture content or yield of dry matter are not known, emissions can be calculated based on moist yield and adapted by applying a moisture factor (see 4.2). Therefore, the moisture content should be measured after delivery to the first gathering point or be based on the maximum value allowed by the delivery contract with the first gathering point

Replanting activities

Relevant input data for cultivation

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In the case that further emission-relevant inputs are used during cultivation, the relevant amounts per ha and time period must be documented and included in the calculation.

Published data

The following data for the calculation of GHG emissions are normally gathered from literature or other officially recognised or certified sources:

- > EFs for seeding material in kg CO₂eq/kg seeding material
- > EFs for plant protection products in kg CO₂eq/kg active ingredient
- > EFs for synthetic fertilisers reflecting the emissions of production, extraction and processing of the fertilisers in kg CO₂eq/kg nutrient (to be applied for P₂O₅, K₂O, CaO, and synthetic N fertiliser)
- EFs for field emissions of all nitrogen fertilisers including synthetic and organic N fertiliser and crop residues in kg CO₂eq/kg N (EF_{field})
- EFs for diesel, electricity or other energy source in kg CO₂eq per unit of energy used

After calculating the GHG emissions per dry-ton of raw material, the certified agricultural producers or FGPs/Central offices (on behalf of the farmers belonging to the group) forward the GHG information for e_{ec} in kg CO₂eq/dry-ton raw material together with the agricultural raw material itself to the recipient.

4.3.2 Emissions from carbon stock changes caused by land-use change (e_i)

Land-use change is a change from one of the following IPCC land cover categories: forest land, grassland, wetlands, settlements, or other land, to cropland or perennial cropland¹³. 'Cropland' and 'perennial cropland' shall be regarded as one land use. GHG emissions from land-use change (e_I) between the five land categories to cropland or perennial cropland taking place after the cut-off date of 1 January 2008 and in compliance with ISCC sustainability principle 1 (see ISCC EU System Document 202-1 "Agricultural Biomass – ISCC Principle 1") must be taken into account. A change in cropland structure, management activities, tillage practices, or manure input practices is not considered land-use change.

For calculating emissions in kg CO_2eq/dry -ton of raw material, the carbon stock of the actual land use (CS_A) is subtracted from the carbon stock of the reference land use (prior to the land-use change) (CS_R). The result is divided by the yield of raw material (which is measured as dry matter or by adapting the emissions value by applying a moisture factor (see 4.2)) and annualised over 20 years. In order to convert the carbon (C) to CO_2eq -emissions, the

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Definition and reference year land use change

Relevant emission factors

¹³ Perennial crops are defined as multi-annual crops, the stem of which is usually not annually harvested such as short rotation coppice and oil palm.

conversion factor of 3.664 must be applied. The following formula needs to be applied:

Formula for e

$$e_{l}\left[\frac{kg\ CO_{2}eq}{ton}\right] = \left(\frac{CS_{R}\left[\frac{kg\ C}{ha}\right] - CS_{A}\left[\frac{kg\ C}{ha}\right]}{yield\ raw\ material\left[\frac{ton}{ha\ * yr}\right] * 20\ [yr]} * 3.664\right) - eB$$

As the total carbon stock change is annualised over 20 years, the GHG emissions from land-use change must be considered for a period of 20 years after the land-use change took place. The reference land use (CS_R) and the actual land use (CS_A) are defined by the mass of carbon in the soil and vegetation per unit of land:

- CS_R = The carbon stock per unit area associated with the reference land use (land carbon stock before conversion into agricultural land) measured as mass (tons) of carbon per unit area, including both soil and vegetation. The reference land use shall be the land use in January 2008 or 20 years before the raw material was obtained, whichever is more recent;
- CS_A = the carbon stock per unit area associated with the actual land use (carbon stock per unit of land after conversion into agricultural land) measured as mass (tons) of carbon per unit area, including both soil and vegetation. In cases where the carbon stock accumulates over more than one year, the value attributed to CS_A shall be the estimated stock per unit area after 20 years or when the crop reaches maturity, whichever is earlier;

The carbon stock (CS) of land use i (reference or actual) per unit area takes into account the soil organic carbon as well as the carbon of the vegetation:

$$CS_i = (SOC + C_{veg}) * A$$

A is referring to the converted area (is 1 if whole area is subject to conversion).

 C_{veg} is the above and below ground carbon stock of the vegetation. The vegetation value for cropland is zero¹⁴. The soil organic carbon (SOC) consists of four factors, which depend on climate, soil type, management practice and C-input practice: the standard soil organic carbon in the 0-30 cm topsoil layer (SOC_{ST}), the land use factor (F_{LU}), the management factor (F_{MG}) and the input factor (F_i):

$$SOC = (SOC_{ST} * F_{LU} * F_{MG} * F_i)$$

Formula for CS

C_{veg} is zero fro cropland

Formula for SOC

Forwarding of e

¹⁴ EC Communication 2010/C160/02 from the Commission on the practical implementation of the EU biofuels and bioliquids sustainability scheme and on counting rules for biofuels. Brussels.

Together with the batch of the respective agricultural raw material, the supplier forwards the actual GHG value for land-use change e_1 in kg CO₂eq/dry-ton raw material to the recipient.

The RED II also provides the option for a GHG bonus if degraded land is restored:

 e_B = bonus of 29 g CO₂eq/MJ for biofuel, bioliquid, biomass fuel if biomass is obtained from restored degraded land

The bonus of 29 g CO_2eq/MJ can only be applied and attributed if evidence is provided that the land:

- > was not in use for agriculture or any other activity in January 2008; and
- > is severely degraded land, including land that was formerly in agricultural use.

The bonus of 29 g CO_2 eq/MJ shall apply for a period of up to 20 years from the date of conversion of the land to agricultural use, provided that a steady increase in carbon stocks as well as a sizable reduction in erosion phenomena for land falling under severely degraded land are ensured. Severely degraded land means land that, for a significant period of time, has either been significantly salinated or presented significantly low organic matter content and has been severely eroded (e.g. characterised by soil erosion, significant loss of soil quality or biodiversity).

Auditors need to verify on farm/plantation level during the farm audit if the requirements stated above are fulfilled so that the bonus can be applied. If a farm/plantation is compliant with these requirements, the respective information needs to be forwarded through the supply chain via Sustainability Declarations and the final biofuel producer can deduct the bonus from the total GHG value of the final product in the final biofuel proof of sustainability (PoS).

4.3.3 Emission saving from soil carbon accumulation via improved agricultural management (e_{sca})

The RED II allows the use of emissions savings, e_{sca} , due to carbon accumulation in soil driven by the adoption of improved agricultural management. According to the Annex V of the IR improved agricultural management practices accepted for the purpose of achieving emission savings from soil carbon accumulation include:

- > Shifting to reduced or zero-tillage.
- > Improved crop rotation.
- > The use of cover crops, including crop residues management.
- > The use of organic soil improver (e.g. compost, manure fermentation digestate, biochar etc.).

According to the Annex V of the IR, e_{sca} value has to be calculated according to the following formula:

Bonus "severely degraded land"

Forwarding of eb

How to calculate

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$$e_{sca}\left[\frac{gCO_2eq}{MJ}\right] = (CS_A - CS_R) * 3.664 * 10^6 * \frac{1}{n} * \frac{1}{P} - e_f$$

Where:

- CS_R is the mass of soil carbon stock per unit area associated with the reference crop management practice in Mg of C per ha.
- CS_A is the mass of soil estimated carbon stock per unit area associated with the actual crop management practices after at least 10 years of application in Mg of C per ha.
- **3**, **664** is the quotient obtained by dividing the molecular weight of CO₂ (44,010 g/mol) by the molecular weight of carbon (12,011 g/mol) in g CO₂eq/g C.
- *n* is the period (in years) of the cultivation of the crop considered.
- **P** is the productivity of the crop (measured as MJ biofuel or bioliquid energy per ha per year).
- e_f emissions for the increased fertilizer or herbicide use.

Under ISCC the following formula applies aligned to the concept of forwarding other emission values up to the final biofuel producer on mass-basis:

$$e_{sca}\left[\frac{kg\ CO_2eq}{ton}\right] = \left(\frac{CS_A\left[\frac{kg\ C}{ha}\right] - CS_R\left[\frac{kg\ C}{ha}\right]}{yield\ raw\ material\left[\frac{ton}{ha\ * yr}\right]\ *\ n\ [yr]}\ *\ 3.664\right) - ef$$

The calculation of the actual values of CS_R and CS_A shall be based on measurements of soil carbon stocks.

The entire area for which CS_R and CS_A are calculated shall have a similar climate and soil type as well as similar management history in terms of tillage and carbon input to soil. If the improved management practices are only applied to part of the farm, the GHG emissions savings can only be claimed for the area covered by them. If different improved management practices are applied on a single farm, a claim of GHG emission savings shall be calculated and claimed individually for each e_{sca} practice.

To ensure reduced year-to-year fluctuations in the measured soil carbon stocks and to reduce associated errors, fields that have the same soil and climate characteristics, similar management history in terms of tillage and carbon input to soil and that will be subject to the same improved management practice may be grouped, including those fields belonging to different farmers. If e_{sca} is calculated, information on the e_{sca} methodology has to be provided¹⁵.

The e_{sca} calculation shall be based on field measurements. However, the integration between the field measurement and soil/crop modelling may be possible under certain conditions.

The calculation of carbon stocks and the e_{sca} shall follow the following steps:

- 1. The measurement of CS_R shall be carried out at the farm level before the improved management practice is applied, in order to establish a baseline. In the absence of such a reference, it will not be possible to detect any potential soil carbon accumulation and the respective magnitude.
- 2. Once the baseline is established, the CS_A shall be measured at regular intervals no later than 5 years apart.
- 3. After the first measurement of CS_A and the establishment of the baseline, the increase in soil carbon can be estimated based on representative experiments or soil models, before a second measurement of the increase in carbon stock is made. The requirements for the integration of soil carbon stock measurements and modelling estimates are as follows:
 - a. The models used shall take into account the different soil, climate and field management history to simulate carbon dynamics in soil.
 - b. From the second measurement onwards, the measurements shall constitute the ultimate basis for determining the actual values of the increase in soil carbon stock.

In order to claim the e_{sca} , field measurements of soil carbon stocks shall be performed by certified laboratories and samples shall be retained for a period of at least 5 years for auditing purposes. The measurement of carbon stocks in the field shall follow the rules described below to ensure the representativeness of soil sampling and to secure that the relevant parameters are measured and properly determined.

Representative sampling method:

- > Sampling shall be made for each plot or field.
- > At least one grab sample of 15 well distributed sub-samples per every 5 hectares or per field, whichever is smaller (taking into account the heterogeneity of the plot's carbon content), shall be taken.
- Smaller fields with the same climatic conditions, soil type, reference farming practice, and e_{sca} practice can be grouped.
- Sampling shall be done either in spring before soil cultivation and fertilization or in autumn, a minimum of 2 months after harvest.

Two options for e_{sca} calculation

Calculation approach

Field measurement rules

Sampling rules

¹⁵ISCC will provide statistical information and qualitative feedback on the esca methodology in the annual activity report as described in the EU 102 Governance document.

- > Direct measurements of soil carbon stock changes shall be taken for the first 30 cm of soil.
- > The points of the initial sampling to measure the baseline of soil carbon stocks shall be used under identical field conditions (especially soil moisture).
- > The sampling protocol shall be well documented.

Measurement of the soil carbon content

- > Soil samples shall be dried, sieved, and, if necessary, grounded.
- > If the combustion method is used, inorganic carbon shall be excluded.

Determination of dry bulk density

- > Changes in bulk density over time shall be taken into account.
- > Bulk density should be measured using the tapping method, by mechanically tapping a cylinder into the soil, which greatly reduces any errors associated with bulk density measurement.
- > If the tapping method is not possible, especially with sandy soils, another reliable method shall be used instead.
- > Samples should be oven-dried before weighing.

After the second measurement, economic operators may use modelling to estimate the annual increase in soil carbon stocks. This is possible only until the next measurement becomes available and only if the models used have been calibrated, based on the real values measured. Only modelling estimates obtained by ISCC-validated models described below, can be accepted for the integration with field measurement values. However, the final actual values that are established based on the soil carbon measurements results, shall be used to adjust the annual claims of e_{sca} , made on the basis of modelling.

According to the Annex V of the IR, models used to estimate soil carbon increase between the baseline and the second measurement, and in between successive measurements after the second one, shall take into account the different soil types, climate conditions and field management history. On this basis, ISCC has assessed and validated for such use the soil models listed below. Economic operators which intend to use soil modelling integrated with field measurement shall use one of those. Any other model outside the models validated by ISCC will not be accepted for the purpose of e_{sca} estimate.

RothC is a well-established and robust model for the turnover of organic carbon in non-waterlogged topsoils that allows for the effects of soil type, temperature, moisture content and plant cover on the turnover process. RothC was developed by the Institute of Arable Crops Research-Rothamsted (IACR) (formerly known as Rothamsted Experimental Station) in the UK. RothC was

Integration with modelling

Validated soil models

RothC model

originally developed and parameterized to model the turnover of organic C in arable topsoils from the Rothamsted Long Term Field Experiments - hence the name. Later, it was extended to model turnover in grassland and woodland and operate in different soils and climates.

The model is structured to consider four active compartments of soil plus a small amount of inert inorganic matter. The soil organic carbon in tonnes/ha at the start of the RothC simulation is divided into decomposable plant material (DPM) and resistant plant material (RPM), both of which decompose, by first-order processes to give CO_2 (lost from the system), microbial biomass (BIO) and humified organic matter (HUM). Both BIO and HUM decompose at their characteristic rates by first-order processes to give more CO_2 , biomass and humified matter. The soil is also assumed to contain a small organic compartment that is inert to biological attack which is known as IOM (inert organic matter).¹⁶

It uses a monthly time step to calculate total organic carbon (t ha -1), microbial biomass carbon (t ha -1) and Δ 14C (from which the equivalent radiocarbon age of the soil can be calculated) on years to centuries timescale¹⁷.

The input information required to run the model are:

- > average monthly rainfall (mm),
- > average monthly open pan evaporation (mm),
- > average monthly air temperature (°C),
- > clay content of the soil (%),
- > an estimate of the decomposability of the incoming plant material,
- > soil cover for each month (between 0 = bare and 1 = vegetated),
- > monthly input of plant residues (t C/ha),
- > monthly input of farmyard manure (FYM) (t C/ha) (if applicable)
- > the depth of soil sample (cm).

RothC model can be applied to simulate and estimate soil carbon accumulation in arable crops in different soils and climates. It can also be used with reliable results on grassland and woodlands. However, it should be used cautiously on subsoils, soils developed on recent volcanic ash, soils from the tundra and taiga and not at all on soils that are permanently waterlogged.

RothC runs in two modes 'forward' and 'inverse'. In the former, known inputs are used to calculate changes in soil organic matter, while in the latter, inputs are calculated from known changes in soil organic matter. For the purpose of

RothC structure

RothC input

Applicability and limitations

'Forward' mode

¹⁶ Jenkinson et al., 1991

¹⁷ Jenkinson et al. 1987; Jenkinson, 1990; Jenkinson et al. 1991; Jenkinson et al. 1992; Jenkinson and Coleman, 1994

 e_{sca} estimate, only the results obtained by ROTHC model, run in 'forward' mode, will be accepted.

Century model

The CENTURY model is another option that can be accepted by ISCC for e_{sca} estimate purposes. It is a plant-soil ecosystem model that has been developed by Parton et al. (1987) to simulate C, N, P, and S dynamics through an annual cycle over different time scales. The primary purpose of the model is to provide a tool for ecosystem analysis to evaluate the effect of changes in management and climate on ecosystems. The model was specially developed to deal with a wide range of cropping system rotations and tillage practices for system analysis of the effects of management and global change on the productivity and sustainability of agroecosystems.

The CENTURY model has a long application history in the simulation of ecosystem dynamics for all the major agroecosystems and dominant cropland of the world. It has been used to simulate the response of these ecosystems to changes in environmental driving variables (e.g., maximum, and minimum air temperature, precipitation, and atmospheric CO_2 levels) and changes in the management practices (grazing intensity, forest clearing practices, burning frequency, fertilizer rates, crop cultivation practices etc.) for grasslands, crop, forest, and savanna ecosystem. In addition, CENTURY has been successfully applied to a variety of scales, including national, regional, and plot-level experiments for a range of long-term experiments (Ogle et al., 2010). Such a wide applicability and proven robustness makes this model suitable for the e_{sca} purposes.

The structure of CENTURY model comprises a series of submodels simulating plant growth, nutrient cycling, and soil organic matter (SOM) dynamics for grassland, agricultural (i.e., cropland), forest, and savanna system. The major structural components of the CENTURY model are:

- > Plant production: the submodel calculates potential plant production and nutrient demand as a function of monthly average soil temperature and precipitation, it reduces plant protection, based on available soil nutrients and allocates new C, N, and P to the different live plant compartments.
- Soil organic matter: through multiple components, the submodel simulates the dynamics of carbon and soil nutrients for the different inorganic and organic SOM pools. Decomposition of the SOM pools results in the release of soil nutrients from the SOM pools which are then available for plant uptake. Dead plant material from the plant production submodel flows into the surface and belowground litter pools, which are inputs to the SOM model.
- > Soil water and temperature sub-models: Monthly precipitation, stored soil water, and soil temperature control the rate of decomposition of

CENTURY model

CENTURY structure the soil organic matter pools and the release of nutrients from the SOM pools.

The input required to run the CENTURY model refers to soil texture and type, climate, and agricultural management practices. Those are available for most natural and agricultural ecosystems and can generally be estimated from existing literature. Table 3 shows in detail the input variables requested by the model.

Input Variables							
• "		Agricultural practices (if					
Soil	Climate	applicable)					
Mandatory:	 Monthly precipitation 	 Type of crop in use 					
-Texture (fraction 0-1): sand, silt,	 Temperature (minimum and 	 Date of crop planting 					
and clay	maximum)	 Type of harvest 					
 Lignin, N, S and P content of 	 Monthly average maximum and 	 The First month of growth for 					
plant material	minimum air temperature	crops					
 Soil and atmospheric N inputs 		 Last month of growth for 					
 Initial soil carbon, nitrogen (crops					
phosphorous and sulfur optional)		 Months of senescence for 					
		crops					
Optional:		 Fertilization event in the 					
- Bulk density		current month					
- pH		 Cultivation event in the 					
 Soil drainage class 		current month					
 Soil layers and thickness: the 		 Organic matter addition 					
rooting zone depth (depth above		event in the current month.					
which most fine roots are found)		 Irrigation event in the current 					
 Stream flow calibration 		month					
 Field capacity and wilting point 		 Grazing event in the current 					
 External nutrient input 		month -					
parameters		Erosion event in the current					
 Forest soil: initial forest floor and 		month					
soil carbon storage		 Fire in the current month 					
		- Tree type					
		- Tree removal					
		 The first month of growth of 					
		the forest					
		 The last month of growth of 					
		the forest					

Table 3 – Detailed input for the CENTURY model

The CENTURY model can be used to simulate soil organic carbon dynamics across a variety of ecosystems including grassland, croplands, savanna, and forests, for a range of timescales from years to centuries. Simulation of complex agricultural management systems including crop rotations, tillage practices, fertilization, irrigation, grazing, and harvest methods is also possible. CENTURY model can be applied to a variety of scales from national, to regional and down to farm and plot scale.

Alongside the CENTURY model, the DAYCENT model exists and represents a third accepted option for the e_{sca} estimate purpose. DAYCENT (Parton et al. 1998, DelGrosso et al. 2001, Kelly et al. 2000) is the daily time step version of the CENTURY ecosystem model. It includes submodels for plant productivity, decomposition of dead plant material and SOM, soil water and temperature dynamics, and trace gas fluxes which requires a finer time scale resolution. In addition to modelling decomposition, nutrient flow, soil water and temperature on a finer time scale than CENTURY, DAYCENT also uses spatial resolution for soil layers. Applicability

DAYCENT model

CENTURY input

General provisions must be considered for the calculation of carbon stocks and of the e_{sca} :

- > Emission savings from such improvements can be considered if evidence is provided that the above-mentioned practices were adopted after January 2008.
- > CS_R must be set before the improved agriculture management is applied. In absence of that, changes in soil organic carbon (and their magnitude) cannot be detected.
- Solid and verifiable evidence for each individual farmer who claims e_{sca} must be provided that the improved agricultural management practices giving right to e_{sca} claim are implemented in best practice so that an increase in soil carbon can be expected over the period in which the raw materials concerned were cultivated. ISCC reserves the right to reject certain improved agricultural practices if scientific evidence shows that these practices will not sequester the SOC in the long run.
- The actual values for e_{sca} have to be calculated at the individual farm level, i.e. it is not allowed to use a regional approach. This can result in different e_{sca} values per farmer. The area for which the soil carbon stocks are calculated shall have a similar climate and soil type as well as similar management history in terms of tillage and carbon input to soil. In case of non-homogenous soil, climate or management practice(s), soil organic carbon values have to be estimated for every single field the farmer owns, or rents and e_{sca} has to be calculated at the farm level.
- In a single farm where different improved management practices are applied, a claim of GHG emission savings shall be calculated, claimed and forwarded individually for each e_{sca} practice.
- > Averaging emission values from farmers applying esca and farmers not applying esca is not allowed, and only those farmers who apply esca measures are allowed to forward respective values together with the batch of sustainable material.
- Increased use of fertilisers or agrochemicals for pest control (e.g. herbicides), due to the application of improved agricultural practices must be considered in terms of overall GHG emissions from cultivation (e_f). For example, shifting from conventional to no-tillage prevents the mechanical control of weeds through tillage. Also, leaving crop residue in the field, without post-harvest incorporation in soil, may significantly increase the risk of spreading plant diseases to the next crop in rotation. To avoid such problems, the switch to no-tillage practices will most likely result in an increase in agro-chemicals input that must be accounted for. Additionally, for organic fertilisers

> Setting the baseline

Cut-off date

> Evidence required

> e_{sca} actual value

Different
 esca values
 for different
 practices

Averaging is not
possible

> Increased inputs N_2O emissions must be calculated. The implementation of nitrogen fixation crops used to reduce the additional fertilisers can be considered in the calculation. For this purpose, adequate evidence shall be provided on the historic use of fertilisers or herbicide that shall be counted as the average for the 3 years before the application of the new agricultural practices.

The maximum possible total value or the annual claim for e_{sca} is 25 g CO₂eq/MJ biofuel or bioliquids per year, for the entire period of application of the e_{sca} practice. If biochar is used as organic soil improver alone or in combination with other eligible e_{sca} practices, the maximum possible value for the annual e_{sca} claim is raised to 45 g CO₂eq/MJ biofuel or bioliquids.

Primary producers or economic operators, who are already engaged in eligible e_{sca} practices and have made respective e_{sca} claims before the entry into force of the Implementing regulation, may apply a cap of 45 g CO2eq/MJ biofuel or bioliquid in a transition period until the first measurement of the carbon stock is made at the 5th year. In this case, the measured carbon stock increase during the 5th year will become a cap for the annual claims to be made in the following period of 5 years.

Conceding that the first measurement if the carbon stock increase at the 5th year and it shows higher total annual carbon stock increase, compared to the annual claims made, the annual difference can be claimed by primary producers or economic operators in subsequent years to compensate for lower carbon stock increases. If the first measurement of the carbon stock increase, compared to the annual claims made, the annual soil carbon stock increase, compared to the annual claims made, the annual difference has to be deducted accordingly by farmers or economic operators from their claims in the subsequent five years.

In case that the eligible e_{sca} improved agricultural management practices application started in the past, but no previous e_{sca} claims were made, annual retroactive e_{sca} claims can be made, provided that economic operators provide adequate evidence about the start of the application of the improved farming practices. In such a case, the estimate of the CS_R value can be based on a comparative measurement of a neighboring or other field with similar climatic and soil conditions as well as similar field management history. If there is no available data from such a field, the CS_R estimated value can be based on modelling. In that case, a first measurement shall be done immediately, at the moment of commitment. The next measurement of carbon stock increase will have to be made 5 years later.

A retroactive e_{sca} claim is possible for no longer than 3 years prior to the moment of e_{sca} certification.

In contrast to a direct avoidance of GHG emissions, the increase of SOC as a climate protection measure is only effective if carbon storage is long-term and the corresponding amount of CO_2 is thus removed from the atmosphere for the foreseeable future. Changes in agricultural practices can completely

Annual caps for e_{sca} claim

> Rules for previously engaged operators

Retroactive esca claim

Long-term commitment

reverse the positive effect of the SOC build-up. Hence, a long-term commitment by the farmer or economic operator is requested to continue applying the improved management practice for a minimum of 10 years for GHG emission savings to be taken into consideration. The long-term commitment may be implemented as a 5-years renewable commitment. Failure to meet this criterion will lead to all esca values of the current year for the farmer or economic operator being added as emissions to the overall GHG emissions of the energy crop delivered, instead of being deducted as GHG emissions savings. Additionally, including an esca value in the GHG calculations will be prohibited for 5 years. In case a long-term commitment is signed in the name of an economic operator on behalf of several farmers and one of these farmers withdraws early, the above-mentioned 5-years penalty shall apply only to the farmer concerned and not to all the commitments of the economic operator. Once the 5-years penalty is over, farmers will be requested to set a new CS_R baseline and to follow entirely the rules defined above for the esca calculation, to be entitled again for esca claims. Regarding penalties¹⁸ relating to farmers' operation under a group, ISCC will enforce the penalties and duly inform all other voluntary schemes as well as publish this information as described in the ISCC EU system document 102 "Governance".

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Long-term commitment failure and penalties

3 years minimum period

Forwarding of esca

Additionally, the improved agricultural management practices shall be applied **continuously** for at least three years successively if the economic operators would like to account for e_{sca} . This means that it is not allowed to switch management practices every year when e_{sca} is claimed.

Together with the batch of the respective agricultural raw material, the supplier forwards the actual GHG value for soil carbon accumulation via improved agricultural management e_{sca} in kg CO₂eq/dry-ton raw material to the recipient.

Specific requirements for biomass fuels:

For e_{sca} a bonus of 45 g CO₂eq/MJ manure shall be attributed for improved agricultural and manure management in the case animal manure is used as a substrate for the production of biogas and biomethane. Auditors need to verify during the audit at the biogas plant if the bonus can be applied. In case of compliance, respective information needs to be forwarded throughout the supply chain via Sustainability Declarations and the final biofuel producer can deduct the bonus in the final biofuel proof of sustainability (PoS). Auditors need to verify at the processing unit if the above stated requirement is fulfilled so that the bonus can be applied. In case of compliance, respective information needs to be forwarded throughout the supply chain via Sustainability Declarations and the supply chain via Sustainability Declarations and the supply chain via fulfilled so that the bonus can be applied. In case of compliance, respective information needs to be forwarded throughout the supply chain via Sustainability Declarations and the final biofuel producer can deduct the bonus in the final biofuel proof of sustainability (PoS) from the total GHG value of the final product.

¹⁸ For penalties refer to sanctions as it is described in the ISCC System Document 102 "Governance".

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4.3.4 Emissions from transport and distribution (e_{td})

Emissions from transport and distribution, e_{td} , shall include emissions from the transport of raw and semi-finished materials and from the storage and distribution of finished materials.

4.3.4.1 Calculation formula for transport emissions

GHG emissions from upstream transport of the feedstock or downstream transport of the product e_{td} can be calculated based on the following formula:

$$\begin{split} e_{td} \left[\frac{kg \ CO_2 eq}{ton} \right] \\ = \frac{T_{needed} * \left(d_{loaded} [km] * K_{loaded} \left[\frac{l}{km} \right] + d_{empty} [km] * K_{empty} \left[\frac{l}{km} \right] \right) * EF_{fuel} \left[\frac{kg \ CO_2 eq}{l} \right]}{amount \ transported \ material \ [ton]} \end{split}$$

In order to find out how often a transport system was used for the transported amount, T_{needed} must be calculated. If e.g. amount is received in wet-ton, this value is calculated by dividing the amount of transported goods (wet) by the loading weight of the transport system used, e.g. if 100 tons of input material is transported by trucks which can carry 20 tons, 5 trucks ($T_{needed} = 5$) would be needed to transport all the feedstock. The sum of the fuel consumption of loaded transport and empty transport (if applicable) is multiplied with the number of times this transport system is being used and the EF of the fuel. Afterwards emissions are adapated to dry-matter.

As an alternative, the methodology for ton-km may also be used:

 $e_{td}\left[\frac{kg\ CO_2eq}{ton}\right] = Distance[km] * Transport\ Efficiency\left[\frac{MJ}{tkm}\right] * EF_{fuel\ type}\left[\frac{gCO_2eq}{MJ}\right] \\ * \frac{moist\ weight\ transported\ [ton]}{dry\ weight\ transported\ [ton]}$

To calculate the emissions of transport per ton of feedstock, the distance of transportation is multiplied with the transport efficiency of that transportation type, the emission factor of the used fuel and the ratio of moist and dry weight of the transported materials.

After replicating this approach for each different transport type along the transportation route the emissions are summed up to yield the final result.

As processing units calculate upstream transport emissions in kg CO₂eq/dryton feedstock but have to provide GHG values in terms of the output they deliver, emissions need to be adapted to determine kg CO₂eq/dry-ton of product by applying the feedstock factor. In chapter 4.3.7 and 4.3.8 the methodologies for converting and allocating upstream emissions are described. formula for etd

Alternative

Upstream and downstream transport

Formula for etd

Responsibilities of traders:

Paper traders do not calculate emissions from transport but simply forward information on GHG emissions on outgoing sustainability declarations as received.

Traders with storage do not calculate emissions from transport but communicate the transport distance(s) and transport type(s) towards their storage site on the outgoing sustainability declaration. The receiving down stream supply chain unit must account for the emissions from that transport in their GHG calculation.

Traders after the final fuel producer do not calculate, nor amend GHG emission values, as it is the responsibility of the final biofuel/bioliquid/biomass producer responsible to take the complete downstream transport inot account under e_{td}

4.3.4.2 Data basis

On site data gathering

For the calculation of etd the following information needs to be provided through on-site data gathering. All input values must be gathered for the same time period.

- > Transport distance (d) loaded/empty respectively (if the empty return ways are attributable to the certified company they must be taken into account. If the return way is not empty and accountable to another company, which can be proven by relevant documentation, return ways can be excluded for transport calculations),
- > Mode of transport (e.g. diesel truck, 40t) and,
- > Amount of product transported.

Published data

Input data for various transportation types may be found in the Annex IX of the IR 2022/996.

As an alternative to using transport efficiency data from literature, these data can also be measured by the logistics providers and provided to the economic operator who is in charge of calculating emissions from transport. The reports from the logistics provider must be verified.

Together with the batch of the respective material, the supplier forwards the *Forwarding of* e_{td} actual GHG value for transport and distribution e_{td} in kg CO₂eq/dry-ton product to the recipient.

Relevant input data for transport

Relevant published data

The emissions of depots and filling stations may be calculated using the data provided by the JRC¹⁹. The provided values (depot: 0,00084 MJ/MJ fuel, filling station: 0,0034 MJ/MJ fuel) must be multiplied by the appropriate national electricity EF from the IR 2022/996

Specific requirements for biomass fuels:

Gas losses occurring from the transport of gas in the transmission and distribution infrastructure (gas grid) must be included in the scope of the GHG emissions savings calculation. For this purpose a standard factor for grid gas losses of 0.17 g CH₄/ MJ NG supplied should be used²⁰.

4.3.5 Emissions from processing (e_p)

Emissions from processing, e_p , shall include emissions from the processing itself, from waste and leakages, and from the production of chemicals or products used in processing, including the CO₂ emissions corresponding to the carbon content of fossil inputs, whether or not actually combusted in the process. Emissions from processing shall include emissions from drying of interim products and materials where relevant.

4.3.5.1 Calculation formula for processing emissions

The calculation must be based on the following formula:

$$e_{p}\left[\frac{kg \ CO_{2} eq}{ton}\right] = \frac{\left(\frac{EM_{electricity}} + EM_{heat} + EM_{inputs} + EM_{wastewater}\right)\left[\frac{kg \ CO_{2} eq}{yr}\right]}{yield \ product\left[\frac{ton}{yr}\right]}$$

For all types of products, the yield shall refer to the dry matter content. If not calculated per dry ton directly a correction needs to take place (please find the formula in chapter 4.2).

The emissions of the different inputs (EM) must be calculated according to the formulas below and divided by the yield of the main product.

Formula components for calculating EM are:

$$EM_{electricity} = electricity \ consumption \ \left[\frac{kWh}{yr}\right] * EF_{regional \ electricity \ mix} \left[\frac{kg \ CO_2 eq}{kWh}\right]$$

If **electricity** is consumed from the grid, the EF of the national/country electricity mix ($EF_{electricity}$) shall be used. The IR provides country-specific EFs for electricity. If electricity from renewable energies is directly consumed (i.e. not supplied from the grid), an adapted EF for the type of renewable electricity

Emissions from depots and filling stations

> Emissions of individual inputs

(EM)

EMelectricity

¹⁹ European Commission, Joint Research Centre, Padella, M., O'Connell, A., Giuntoli, J. et al., *Definition of input data to assess GHG default emissions from biofuels in EU legislation – Version 1d - 2019*, Publications Office, 2019, <u>https://data.europa.eu/doi/10.2760/69179</u>

²⁰ JRC report (Version 1d - 2019), Definition of input data to assess GHG default emissions from biofuels in EU legislation

may be used if that plant is not connected to the electricity grid. In the case that an electricity production plant is connected to the grid (e.g. a waste incineration plant), using the average emission value for electricity from that individual electricity production plant in the biofuel production process is permitted if it is guaranteed that there is a direct connection between the biofuel plant and the individual electricity production plant and that it is possible to validate the amount of electricity used with a suitable meter.

For calculating the emissions from heat production, two different formulas can be used, based on the available units of the provided heat:

$$EM_{heat} = fuel \ consumption \ \left[\frac{kg \ or \ l}{yr}\right] * EF_{fuel} \left[\frac{kg \ CO_2 eq}{kg \ or \ l}\right] \text{ or}$$

$$EM_{heat} = heat \ produced \ from \ fuel \ \left[\frac{MJ}{yr}\right] * EF_{fuel/heat \ system} \left[\frac{kg \ CO_2 eq}{MJ}\right]$$

As the EFs for heat production differ for the fuel and the heating system, both data must be documented. For calculating EM_{heat} the consumed heat or the fuel consumption for producing the heat for all activities during processing must be determined and multiplied with the respective EF. If heat and electricity are consumed from a combined heat and power system (CHP), two EFs exist, one for the produced heat and the other for the produced electricity. One can either determine the total fuel consumed in the CHP and multiply that with the EF for the fuel or determine electricity and heat production and apply the different EFs for heat and electricity.

EM_{inputs} refers to all other types of inputs required as e.g. consumed chemicals (e.g. hydrogen), other production goods, process water, or diesel or other fuel used in the production process (e.g. natural gas).

 $EM_{wastewater} = wastewater \left[\frac{cbm}{vr}\right] * EF_{wastewater} \left[\frac{kg \ CO_2 eq}{cbm}\right]$

All wastewater that is generated during the activities of processing must be documented and multiplied with the respective EF.

4.3.5.2 Data basis

Every processing unit in the supply chain must guarantee that all GHG emissions from processing, GHG emissions from wastes (wastewater), and from process-specific inputs are included in the emissions calculation. Annual average figures can be used.

System boundaries

EMheat

EMwastewater

Emissions from processing need to be allocated to main products and coproducts. The methodology for doing so is described in chapter 4.3.7 "Working with incoming emission values" and 4.3.8 "Allocation of emissions to main products and co-products".

For the calculation of GHG emissions from processing (e_p) as a minimum, the following data shall be determined i.e. the respective quantities must be extracted from respective operating documents for the previous year and must be verified by the auditors.

On-site data gathering

On-site data always needs to be gathered for the whole process and not purely for biofuel-relevant processes. The following data for the calculation of GHG emissions must be gathered on-site. All input values must be gathered for the same time period.

- Amount of main product and co-products in tons per year. Either refers to dry matter or emissions must be adapted by applying a moisture factor (see formula in 4.2)
- > Amount of process-specific inputs used (e.g. methanol, NaOH, HCl, H2SO4, hexane, citric acid, fuller's earth, alkali, process water, diesel or other fuel) in kg per year or litres per year
- Combustion emissions of fossil methanol or other process catalysts > containing methanol (e.g. potassium methylate) must also be taken into account and need to be reflected in the relevant EF and must be verified by the Certification Body
- > Electricity consumption in kWh/yr and source of electricity (e.g. grid)
- Heat consumption in MJ/yr, fuel for heat production (e.g. natural gas) and type of heating system (e.g. boiler or combined heat and power system)
- > Amount of wastes (e.g. palm oil mill effluent (POME), wastewater) in kg/yr

Published data

The following data for the calculation of GHG emissions can be gathered from recognised/certified sources:

- > EFs for process specific inputs in kg CO₂eq/kg and fuels used in kg CO₂eq/l
- EFs for electricity consumption based on the source of electricity in kg CO₂eq/kWh
- EFs for heat consumption based on the fuel and the type of heating system in kg CO₂eq/MJ.

Emissions allocation to different products

Relevant input data for processing

Combustion emissions

Relevant published data

Forwarding of ep

The actual GHG value for an intermediate product must be provided to the recipient of the product in the unit kg CO_2eq/dry -ton product. The total GHG emissions are calculated per dry-unit mass of the main product (e.g. kg CO_2eq -emissions/dry-ton of sunflower oil). If a processing unit has received actual values and also conducts an individual calculation, emissions produced at the processing unit have to be added by applying a feedstock and allocation factor (see chapter 4.3.7 and 4.3.8).

Specific requirements for bioliquids and biomass fuels:

For the individual calculation of GHG emissions for biogas and biomethane plants the substrate quantities documented in the operations journal and the assigned GHG values must be taken into account for the calculation. The total biogas and/or biomethane yield will be allocated to the individual substrates. An exact allocation of substrate quantity and gas yield is not possible. Therefore, the allocation of gas yields is done via literature values such as methane yields (in m3 per ton of fresh mass) that can be found for instance in the German Biomass Ordinance (BiomasseV) or in scientific documents (e.g. KTBL values "Typical values for agriculture").

Biogas plants must consider emissions occurring during the storage of the digestate for the GHG calculation. At the biomethane plant, diffuse methane emissions from the fermentation process must be taken into account when calculating GHG emissions. Methane emissions of 1% of the biomethane quantity produced are assumed. Lower values must be proven by corresponding measurements. Liquefaction emissions and losses must also be accounted for. If no actual data is available, electricity consumption of 0.06048 MJ (LV) / MJ fuel and LNG losses of 0.13 kJ/MJ fuel shall be considered. The electricity consumption has to be multiplied with the respective national grid mix factor from the IR.

Where a cogeneration unit which provides heat and/or electricity to a fuel production process for which emissions are being calculated, produces excess electricity and/or excess useful heat, the GHG emissions shall be divided between the electricity and the useful heat according to the temperature of the heat (which reflects the usefulness (utility)) of the heat.

The following methodologies need to be applied:

For bioliquids: RED II Annex V, C.Methodology, point 16

For biomass fuels: RED II Annex VI, B.Methodology, point 16

The greenhouse gas intensity of excess useful heat or excess electricity is the same as the greenhouse gas intensity of heat or electricity delivered to the fuel production process and is determined by calculating the greenhouse gas intensity of all inputs and emissions, including the feedstock and CH4 and N₂O emissions, to and from the cogeneration unit, boiler or other apparatus delivering heat or electricity to the biomass fuel production process. In the

Allocation to substrate quantities

> Additional Emission Sources

Cogeneration units

case of cogeneration of electricity and heat, the calculation is performed following the two above stated references²¹.

4.3.6 Emission savings from CO₂ capture and replacement (e_{ccr}) and CO₂ capture and geological storage (e_{ccs})

Emission savings from CO₂ capture and replacement (eccr):

"CO₂ Replacement"

> "CO₂ Storage"

The RED II sets out that emission savings from carbon capture and replacement, e_{ccr} , shall be limited to emissions avoided through the capture of CO₂ of which the carbon originates from biomass. e_{ccr} can only be taken into account if it can be proven that the CO₂ replaces fossil-derived CO₂ which is used in the production of commercial products and services. Therefore, the recipient should provide information on how the CO₂ that is replaced was generated previously and declare, in writing, that due to the replacement, emissions are avoided. The auditor is responsible for deciding whether the requirements of the RED II are met on a case-by-case basis, including deciding whether emissions are actually avoided. It is not required to conduct audits on the premises of the recipient as the recipient of the CO₂ is not part of the chain of custody related to the biofuel production. Good examples for a replacement which can be expected to avoid CO₂ emissions are cases where the CO₂ that is replaced was previously produced in a dedicated process aiming at the production of CO₂.

Auditors shall verify that the estimate of emissions saving from capture and replacement of CO2 is limited to emissions avoided through the capture of CO_2 of which the carbon originates from biomass and which is used to replace fossil-derived CO_2 . That verification requires access to the following information:

- > the purpose for which the captured CO2 is used;
- > the origin of the CO2 that is replaced;
- > the origin of the CO2 that is captured;
- > information on emissions due to capturing and processing of CO2.

For the purposes to proof the origin of the CO_2 that is replaced economic operators using captured CO_2 may state how the CO_2 that is replaced was previously generated and declare, in writing, that emissions equivalent to that quantity are avoided as a consequence of the replacement. That evidence shall be considered sufficient to verify compliance with the requirements of Directive (EU) 2018/2001 and the avoidance of emissions.

<u>Emission savings from CO₂ capture and geological storage (e_{ccs}):</u> CCS savings can only be taken into account in e_{ccs} if the emissions have not already been accounted for in e_p . Valid evidence needs to be provided that

²¹²¹ For biofuels and bioliquids: RED II Annex V, C. Methodology, point 16; For biomass fuels: RED II Annex VI, B.Methodology, point 16
CO_2 was effectively captured and safely stored in compliance with Directive 2009/31/EC of the European Parliament and of the Council on the geological storage of carbon dioxide²². Where the CO_2 is geologically stored, CBs shall verify the evidence provided on the integrity of the storage site and the volume of the CO_2 stored and report compliance in the respective audit documentation. If the CO_2 is directly stored it should be verified whether the storage is in good condition, that there are no leakages, and that the existing storage guarantees that the leakage does not exceed the current state of technology. Where a third party carries out the transport or geological storage, proof of storage may be provided through the relevant contracts with and invoices of that third party.

The following formula shall be used to calculate e_{ccr} and e_{ccs} (in g CO₂eq per MJ fuel):

$$\begin{split} e_{ccr/ccs} \left[\frac{g \ CO_2 eq}{MJ} \right] \\ = \frac{\left(produced \ CO_2[kg] - energy \ consumed \ [MWh] \ * \ EF \left[\frac{kg \ CO_2 eq}{MWh} \right] - \ input \ materials \ [kg] \ * \ EF \left[\frac{kg \ CO_2 eq}{kg} \right] \right) \ * \ 1000}{produced \ quantity \ of \ biofuel \ [t] \ * \ 1000 \ * \ lower \ heating \ value \ biofuel \left[\frac{MJ}{kg} \right]} \end{split}$$

For both elements, the emissions saved must relate directly to the production of the biofuel or its intermediates that they are attributed to. All biofuels/intermediates originating from the same process must be treated equally, i.e. the allocation of arbitrarily different amounts of savings to biofuels obtained from the same process is not permitted. If the CO₂ is not captured continuously, it might be appropriate to deviate from this approach and to attribute different amounts of savings to biofuel obtained from the same process. However, in no case should a higher amount of savings be allocated to a given batch of biofuel than the average amount of CO₂ captured per MJ of biofuel in a hypothetical process where the entire CO₂ stemming from the production process is captured. Emissions related to the capture and processing of CO₂ have to be taken into account in the calculation by applying the appropriate EFs for the energy consumed and the inputs used.

On-site data gathering

For the calculation of e_{ccr} and e_{ccs} the following information needs to be gathered on-site:

Amount of biofuel, bioliquid and biomass fuel produced

e_{ccr:} Quantity of biogenic CO₂ captured for replacement of fossil CO₂ during the biofuel, bioliquid and biomass fuel production process

System boundaries

Relevant input data for CO₂ capture

²² Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 on the geological storage of carbon dioxide and amending Council Directive 85/337/EEC, European Parliament and Council Directives 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC, 2008/1/EC and Regulation (EC) No 1013/2006 (OJ L 140, 5.6.2009, p. 114).

- e_{ccs :} Quantity of CO₂ captured and stored for storage during the biofuel, bioliquid and biomass fuel production process
- Origin of the (biogenic) CO₂ (extraction, transport, processing and distribution of fuel)
- Quantity of energy consumed for the capturing and the processing of CO₂ (e.g. compression and liquefaction)
- Other input materials consumed in the process of CO₂ capture and processing

Published data

The following information needs to be gathered from recognised/certified sources:

GHG EFsfor all inputs and their sources (e.g. for input materials, energy consumption etc.)

LHV of the main product in MJ per kg

4.3.7 Working with incoming emission values

As referred to in chapter 3.1, "Use of default values" and 3.2, "Use of actual values" certified economic operators must state the calculated GHG value or DDV for all relevant elements of the calculation formula on the Sustainability Declaration of their product if the TDV is not applied.

If an ISCC System User receives different GHG values, the aggregation of GHG values from incoming input materials is only possible if the product identities and GHG values are the same. As an alternative to using single values for each incoming batch, the highest GHG value (of the least performing batch) can also be used for all incoming batches of the same kind of input material.

Incoming GHG emission values need to be adjusted from kg CO₂eq/dry-ton of feedstock to kg CO₂eq/ton of product. In order to do so, emissions of input materials are multiplied by a fuel **feedstock factor (FF)**. For some of the received actual GHG values, like processing emissions or transport emissions, actual values need to be added at each step of the chain of custody by the respective operational unit.

4.3.7.1 Feedstock factor for intermediates

A feedstock factor (FF) needs to be applied for all incoming emissions (e_{ec} , e_{sca} , e_{l} , e_{p} , e_{td} , e_{ccr} and e_{ccs}) as they are expressed in terms of the input material and need to be converted to the respective outgoing product of the certified unit. Hence, the FF represents the ratio of dry input material required to make one ton of dry output. For intermediate products the FF is *mass-based* and is calculated by dividing the total amount of feedstock (in this case raw material) by the total amount of the intermediate product. The following formula must be applied when processing intermediate products:

Relevant published data

Aggregation of different input values

Requirements for incoming and own GHG values FF = Ratio of X ton dry feedstock required to make 1 ton dry intermediate product

 $=\frac{Total \ amount \ of \ feedstock \ (ton_{dry})}{Total \ amount \ of \ output \ (ton_{dry})}$

The formula below shows an example how the feedstock factor has to be applied when a company has received a GHG value for emissions from cultivation for its input material (e_{ec} of feedstock a), processes the material into an intermediate product (e.g. vegetable oil) and needs to forward an adapted individual value for emissions from cultivation on the outgoing Sustainability Declaration (for the certified vegetable oil):

 e_{ec} interm. $product_{a}\left[\frac{kg \ CO_{2}eq}{ton_{dry}}\right] = e_{ec}feedstock_{a}\left[\frac{kg \ CO_{2}eq}{ton_{dry}}\right] * Fuel feedstock factor_{a}$

After converting the GHG emissions of the incoming input material to the GHG emissions of the intermediate product, the additional emissions of the recipient need to be added to the emissions accordingly. For instance, in figure 7, processing unit P2 has to add its actual GHG values for upstream e_{td} and apply the FF. While incoming emissions of e_p will also be multiplied by the FF, the processing unit's own processing emissions will not, but will only be added to the calculated value of e_p .

4.3.7.2 Feedstock factor for final fuels

As for intermediates, the FF also needs to be applied for all incoming emissions (e_{ec} , e_{sca} , e_{l} , e_{p} , e_{td} , e_{ccr} and e_{ccs}) for final products as they are expressed in terms of the feedstock (in this case a raw material or an intermediate product depending on the type of plant) and need to be converted to the respective outgoing product of the certified unit. An example would be when a final biofuel producer, which has received a GHG value for emissions from extraction and cultivation together with the delivery of the feedstock (e_{ec} of vegetable oil), processes the material into a final product (e.g. biodiesel) and needs to forward an adapted individual value for emissions from cultivation on the outgoing Sustainability Declaration for the biodiesel. For final biofuels the FF is calculated on an *energetic basis* by dividing the total energy content of the feedstock by the total energy content of the final biofuel mainproduct. The following formula must be applied when processing final biofuels:

Final fuel feedstock factor = [Ratio of X MJ feedstock required to make 1 MJ final fuel]

 $FF = \frac{Total \ energy \ content \ of \ feeds tock \ (MJ)}{Total \ energy \ content \ of \ output \ (MJ)}$

The energy content is calculated based on the lower heating value (LHV) of the materials.

Feedstock factor for final fuels

Adding own emissions

Feedstock factor for intermediates

4.3.8 Allocation of emissions to main- and co-products

Only emissions up to and including the production of the intermediate product and co-products can be included in the allocation via an allocation factor (AF). Downstream processing or transport and distribution emissions of an intermediate product cannot be added prior to allocation, as those emissions are not related to the co-products. The allocation of GHG emissions to any products that are considered a waste or residue (including agricultural residues like straw) is not permitted. The emissions to be divided are $e_{ec} + e_{I}$ + e_{sca} + those fractions of e_{p} , e_{td} , e_{ccs} , and e_{ccr} that take place up to and including the process step at which a co-product is produced.

Yields of intermediates/final fuels and co-products shall be measured on-site, while relevant lower heating values can come from published sources. Coproducts that have a negative energy content shall be considered to have an energy content of zero for the purpose of the calculation.

After applying the FF and AF, the certified company passes on the GHG emission information in kg CO₂eq/dry ton intermediate product or g CO₂eq/MJ final biofuel together with the product itself on the Sustainability Declaration.

4.3.8.1 Allocation factor for intermediates

Allocation is done based on the AF, which reflects the relation of the total energy content of the intermediate main product to the total energy content of all products. The energy content is calculated from the lower heating value and the yield of the respective product. The lower heating value shall always refer to the moisture content of the material. The following formula must be applied to all emissions from received materials and emissions produced at the respective certified unit ($e_{ec} + e_{I} + e_{sca}, e_{p}$, $e_{u} e_{td}$, e_{ccr} and e_{ccs}) when calculating the AF:

AF intermediate product

with

Energy content _{interm.product} [MJ] = yield _{interm.product}
$$\left[\frac{kg_{dry}}{year}\right] * LHV_{inter.product} \left[\frac{MJ}{kg}\right]$$

and

$$Energy\ content_{co-product}[MJ] = \ yield_{co-product}\left[\frac{kg_{dry}}{year}\right] * LHV_{co-product}\left[\frac{MJ}{kg}\right]$$

The following formula is used for the calculation of allocated emissions when processing intermediate products:

Relevant data

Forwarding of GHG information

Allocation of intermediates



4.3.8.2 Allocation factor for final fuels

Allocation is done based on the AF, which reflects the relation of the total energy content of the final biofuel main product to the total energy content of all products. The energy content is calculated from the lower heating value and the yield of the respective product. The following formula needs to be applied when calculating the AF:

AF fuel

 $= \frac{Energy \ content_{biofuel}[MJ]}{Total \ energy \ content \ (energy \ content_{ibiofuel}[MJ] + energy \ content_{co-product}[MJ])}$

with

Energy content _{biofuel}[MJ] = yield _{biofuel}
$$\left[\frac{kg_{dry}}{year}\right] * LHV_{fuel} \left[\frac{MJ}{kg}\right]$$

and

$$Energy\ content_{co-product}[MJ] = \ yield_{co-product}\left[\frac{kg_{dry}}{year}\right] * LHV_{co-product}\left[\frac{MJ}{kg}\right]$$

For final fuels the following formula is applicable for the relevant elements in the calculation methodology (shown for the example of e_{ec} , but all other values need to be similarly adjusted):

$$\begin{split} e_{ec}fuel_{a}\left[\frac{g\ CO_{2}eq}{MJ\ biofuel}\right]_{ec} \\ &= \frac{e_{ec}feedstock_{a}\left[\frac{g\ CO_{2}eq}{kg_{dry}}\right]}{LHV_{a}\left[\frac{MJ\ feedstock}{kg\ dry\ feedstock}\right]} * fuel\ feedstock\ factor_{a} \\ & * Allocation\ factor\ fuel_{a} \end{split}$$

AF formula applied

Allocation factor final fuels



Figure 8: Summary of steps required for incoming and own emissions with actual values in an agricultural supply chain for a biofuel

Emissions delivered with the incoming feedstock and the upstream transport emissions, which are given in kg CO_2eq/dry -ton feedstock must be multiplied by the feedstock factor (FF) in order to calculate the emissions in kg CO_2eq/dry -ton of output product. In a second step, for incoming and own emissions the allocation factor (AF) need to be applied (except for downstream transport).

Specific requirements for biomass fuels:

In the case of biogas and biomethane, all co-products shall be taken into account for the purposes of that calculation.

4.3.9 Further requirements for the producers of final biofuels, bioliquids and biomass fuels

A biofuel, bioliquid or biomass fuel is considered to be final if no further processing of the material takes place. The producers of final biofuels, bioliquids and biomass fuels (hereafter called final processing units) must also include emissions from the downstream transport and distribution (up to and including the filling station). Should the exact distance for downstream transport and distribution not be known to the final processing unit, conservative assumptions must be made (e.g. transport distance to Europe and throughout Europe). As those emissions relate only to the biofuel transport, no allocation is possible.

Disaggregated default values for transport and distribution are provided in sections D and E of Annex V and Annex VI of the RED II for certain final fuels. If a final fuel is produced for which no such values are available a conservative approach can be used and the highest value of the most logical choice from these tables can be used (please see chapter 3.1 for further specifications)...

Additionally, the final processing unit must calculate the GHG emissions of all elements of the calculation formula in g CO₂eq/MJ fuel and the GHG saving potential of the final fuel. After the conversion (via feedstock factor) and

Downstream transport and distribution

Calculating emissions in g CO₂eq/MJ fuel allocation of all GHG emissions, as referred to in chapter 4.3.7 "Working with incoming emission values" and 4.3.8 "Allocation of emissions to main- and coproducts", the final GHG emissions (of e.g. cultivation/extraction of the raw material, processing and transport & distribution) are displayed in kg CO₂eq/dry-ton of fuel. In order to determine the GHG emissions per MJ biofuel, the respective lower heating value of the fuel has to be used.

For comparing the emissions to the fossil reference, the sum of all emissions has to be build based on the formula:

Total emissions from the production of the fuel before energy conversion = $e_{ec} + e_l + e_p + eu + e_{td} - e_{sca} - e_{ccs} - e_{ccr}$

The GHG saving potential **for transport fuels** compared to the fossil reference is calculated according to the following formula:

GHG saving formulas for transport market

Biofuels:

GHG saving potential[%]

= $\frac{GHG\ emission\ from\ fossil\ fuel\ comparator\ for\ transport\ -\ GHG\ emission\ from\ biofuel}{GHG\ emission\ from\ fossil\ fuel\ comparator\ for\ transport}$

* 100

Biomass fuels:

GHG saving potential[%]

= $\frac{GHG\ emission\ from\ fossil\ fuel\ comparator\ for\ transport\ -\ GHG\ emission\ from\ biomass\ fuel\ used\ in\ transport\ }{GHG\ emission\ from\ fossil\ fuel\ comparator\ for\ transport\ }$

* 100

Energy producers must apply the respective fossil fuel comparator value for the target market. The GHG saving potential generated **from heating and cooling**, **and electricity** compared to the fossil reference is calculated according to the following formula:

GHG saving formula for heating/cooling/ electricity markets

Bioliquids and biomass fuels:

GHG saving potential[%]

= $\frac{GHG\ emission\ fossil\ from\ fossil\ fuel\ comparator\ for\ uselful\ heat\ or\ electricity\ -GHG\ emission\ from\ heat\ or\ electricity}{GHG\ emission\ fossil\ from\ fossil\ fuel\ comparator\ for\ uselful\ heat\ or\ electricity}}$

* 100

The following emission values shall be used for fossil references:

Biofuels for transport²³: 94 g CO₂eq/MJ fossil fuel²⁴,

Fossil references

²³ Including biomass fuels used as transport fuels

Bioliquids used for electricity, and production of energy for heating and/or cooling: 183 g CO_2eq/MJ ,

Bioliquids used for the production of useful heat, as well as for the production of heating and/or cooling: 80 g CO_2eq/MJ

For biomass fuels used for the production of electricity the fossil fuel comparator shall be 183 g CO_2eq/MJ electricity or 212 g CO_2eq/MJ electricity for the outermost regions²⁵

For biomass fuels used for the production of useful heat, as well as for the production of heating and/or cooling the fossil fuel comparator shall be 80 g CO_2eq/MJ heat

For biomass fuels used for the production of useful heat, in which a direct physical substitution of coal can be demonstrated, the fossil fuel comparator shall be $124 \text{ g CO}_2 \text{eq/MJ}$ heat

After applying the FF and AF, the certified company passes on the GHG emission information in g CO_2eq/MJ final fuel product together with the information on GHG savings as well as the start date of biofuel/ bioliquid/ biomass fuel production on the Sustainability Declaration.

Specific requirements for bioliquids and biomass fuels

The final producer also needs to take into account the emissions from the fuel in use (e_u). Emissions of CO₂ from fuel in use, e_u , are given as zero for biofuels, bioliquids and biomass fuels, but emissions of non-CO₂ greenhouse gases (CH₄ and N₂O) from the fuel in use shall be included in the e_u factor for bioliquids and biomass fuels. RED II, Annex VI outlines default value information on "non-CO₂ emissions from the fuel in use" for some biomass fuels. For all other biomass fuels and bioliquids which are not mentioned there but for which this additional information needs to be provided, System Users can use a conservative approach and apply the highest value given for e_u from the reference table mentioned above or values from recognised published literature²⁶ can be applied. The information on emissions from " e_u " needs to be forwarded together with the batch of sustainable material on the Sustainability Declaration.

5 Documentation and verification requirements

Depending on the type of GHG information an economic operator is using, different evidence must be kept for audit verification.

Fuel in use

²⁵ Outermost regions according to Article 349 TFEU are Guadeloupe, French Guiana, Martinique, Mayotte, Réunion and Saint Martin (France), the Canary Islands (Spain) and the Azores and Madeira (Portugal)

²⁶ E.g. JRC Science for Policy Report "Solid and gaseous bioenergy pathways: input values and GHG emissions: Calculated according to methodology set in COM(2016) 767: Version 2"

Verification of total or disaggregated default values:

When default values are used, the auditor must verifiy that following requirements are met:

- > Does the upstream supply chain fulfil the requirements for using (disaggregated) default values. This can be verified by checking the Sustainability Declarations of the incoming input material.
- > Does the economic operator fulfil the requirements for using (disaggregated) default values. This can be verified by checking the feedstock, production pathway and produced fuel and compare it with the data provided in the REDII.

Verification of individually calculated values:

The following verification approach is required for all individual calculations:

- > Every Certification Body that verifies individual GHG emission calculations needs to have at least one GHG expert auditor who is responsible for verifying the methodology and the input data prior to the audit. In order to become a GHG expert, the auditor has to participate in an ISCC GHG training²⁷
- The ISCC System User has to make the GHG emission calculation of the planned audit available to the Certification Body (e.g. in Excel) in a verifiable format (without sheet protection) in sufficient time in advance prior to the audit. The GHG calculation sheet should have a clear structure with a setup overview, process details and detailed references to enhance verification efficiency. That information shall include input data and any other relevant evidence, information on the emission and conversion factors and standard values applied and their reference sources, GHG emission calculations and evidence relating to the application of GHG emission saving credits. Further helpful information to be provided includes summarized results of emissions, as well as translations. Links to other documents and assumptions (e.g. for design data) must be indicated.
- > The GHG expert checks information (e.g. methodology, EFs, LHVs, other standard values etc.) prior to the on-site certification audit. If they have any questions and/or require any corrections, the CB must contact the client for clarification
- > During the on-site certification audit, the auditor verifies all relevant information concerning the calculation of actual GHG values (e.g. type of heat, types of inputs, consumption amounts etc.)
- > The auditor has to document emissions occurring at the audited site. For the processing of final fuels, the auditor shall record the emissions after allocation and the achieved savings. If the emissions deviate

Verification of default values

Verification approach of actual values

²⁷ Please also see ISCC EU System Document 103 "Requirements for Certification Bodies and Auditors

significantly from typical values (more than 10% deviation), or calculated actual values of emissions savings are abnormally high (more than 30% deviation from default values), then the report must also include information that explains the deviation. Certification bodies must immediately inform the voluntary scheme of such deviations.

- If the Certification Body requests any corrections, System Users must provide an updated file to the CB so that a final confirmation can take place
- > ISCC System Users are only allowed to use the actual value after the CB has explicitly confirmed that it is correct. Only values that have been verified and approved by auditors can be passed on in the supply chain. It is not allowed to alter individually calculated GHG emission values from incoming materials to random numbers for outgoing sustainability documentation.
- > Additionally, CBs need to provide GHG calculations together with other certification documents to ISCC. This is in order to facilitate a prompt investigation by ISCC in case of alleged non-compliance of actual GHG emission values. These documents (preferably in non-protected Excel) must be complete, transparent and include the methodology, formulas, input values, EFs and respective sources
- > The procedure above also applies if a System User would like to switch from default to individually calculated values
- If an actual calculation which has already been verified is updated, the System User must contact the CB. The System User must clearly communicate all relevant changes and additions made to the CB. It is the responsibility of the CB to decide if an on-site audit is necessary to verify compliance with ISCC requirements
- In any case, the CB needs to provide ISCC with updated certification documents (annex, audit procedures, GHG calculations)
- > System Users need to send the first three Sustainability Declarations issued after the recertification audit to their CB so that the auditor responsible can verify that the correct default value or, in case of actual values, the approved GHG value is used and applied correctly. All sustainability documentation necessary for verification must be provided in addition (e.g. respective incoming sustainability declarations)
- > Upon request from the European Commission or national bodies/authorities responsible for supervision of the certification bodies ISCC will provide actual GHG emission calculations to the respective parties.

If an individual calculation was conducted, the economic operator has to keep records and evidence of the following data which will be verified during the audit:

- > Evidence of all data for all relevant in- and outputs and feedstock factors of the production process (e.g. production reports, Sustainability Declarations, invoices)
- > Sources of EFs (standard values list of European Commission, ISCC list of emission factors or other scientifically peer-reviewed literature/databases) including the year of publication and their applicability (with respect to time period and region)
- > For external suppliers (e.g. of steam), individual EFs must be provided. It must be possible to verify the EF and the data/methodology used for the calculation within the scope of the audit or the EF must be certified under ISCC
- > Sources for the used lower heating values for main- and co-products (e.g. RED II, ISCC list of EFs and lower heating values (LHVs), scientifically peer-reviewed literature/ databases, documents from laboratory test results)
- > The methodology used for the individual calculation and the calculation itself must be transparent. The calculation itself must be done in a way that allows the auditor to verify the calculation
- For CO₂ Capture and Replacement (CCR), the auditor has to check if the emission saving from CCR is limited to emissions of which the carbon originates from biomass, and which is used to replace fossilderived CO₂. This requires access to information such as a declaration from the recipient of the CO₂, in writing, that fossil-derived CO₂ is avoided due to the CO₂ coming from CCR. The declaration should include information on the purpose for which the captured CO₂ is used
- > For CO₂ Capture and Storage (CCS), the auditor has to check if the emission saving from CCS are limited to emissions avoided through the capture and sequestration of emitted CO₂ and directly relate to the extraction, transport, processing and distribution of the fuel. Valid evidence that CO₂ was effectively captured and safely stored in compliance with Directive 2009/31/EC needs to be provided.
- > For CCR and CCS production processes the applied allocation approaches must be clearly documented by the system user and verified by the auditor.

Verification in case a methane capture device is installed:

Data to be provided

If a methane capture device that can guarantee actual methane capture is operated by the unit, e.g. for pre-treatment of wastewater, the following aspects need to be checked and fulfilled:

- > The methane capture technology at the palm oil mill must ensure that the methane is captured in an efficient manner similar to what has been assumed in the calculation of the default values.
- > Absorption of all wastewater in a closed system (only short-term storage of fresh wastewater) and supply to a methane capture device.
- > Use of the biogas produced for energy purposes or, in the worst case, flaring of the biogas.
- > The methane capture device is in good condition, leakages are nonexistent, and the producer provides a guarantee about the maximum methane leakage that does not exceed the current state of the technology.

Annex I

List of emission factors and lower heating values (LHVs)

The choice of emission and energy factors has an impact on the results of the GHG emissions calculation. It must always be verified that a chosen emission factor is suitable for the process/input it is applied to.

Emission factors describe the relationship between the amount of released GHG emissions and the amount of input material. They are needed in order to calculate the CO_2eq emissions related to a specific input material. Emission factors for energy supply must include direct and indirect effects. Direct effects are atmospheric emissions from combustion, waste, effluents and electricity use. They mainly depend on the carbon content of the fuel. Indirect effects are the upstream emissions of a material. They include e.g. emissions from extraction or processing steps. Both factors – direct and indirect – must be considered in the emission factor used.

Lower heating values are needed for the calculation of feedstock factors (FF) and allocation factors.

The variance of individual emission factors may be large and for some inputs emission factors might not be available or just an approximation can be used. However, to avoid cherry picking and to support objective, transparent and verifiable Individual calculations and audits, whenever possible, system users should use the values provided by the IR 2022/996. Secondly, ISCC has developed a list of emission factors. The list is mainly based on the list of standard calculation values published on the Commission website or LCA Verification of methane capture devices at palm oil mills

Relevant parts of emission factors

Possible sources

Databases such as Ecoinvent (Version 3.9.1 (2022), Allocation cut-off; IPCC 2021; GWP 100a). Alternative values might be used but must be duly justified and flagged in the documentation of the calculations in order to facilitate the verification by auditors (see chapter 4).

The following overview can be updated by ISCC on a continuous base as soon as databases provide new published values.

 Table 1: List of emission factors, lower heating values (LHVs) and their respective sources

Input	Unit	Standard factor	Source, description		
A) Emission factors for cultivation					
Fertiliser					
Ammonium nitrate phosphate	kg CO₂eq/kg N	RER: 1.541 RoW: 2.0635	Ecoinvent v. 3.9.1, 2022: ammonium nitrate phosphate production		
Glyphosate	kg CO2eq/kg	11.691	Ecoinvent v. 3.9.1 2022: market for glyphosate (GLO)		
Seeds					
Seeds corn	kg CO₂eq/kg seed	1.9935	Ecoinvent v. 3.9.1, 2022: maize seed production, for sowing, max. water content of 12% (GLO)		
Seeds soybean	kg CO₂eq/kg seed	3.0472	Ecoinvent v. 3.9.1, 2022: market for soybean seed, for sowing (GLO)		
B) Emission factors for processing					
Process inputs					
Deionised water	kg CO ₂ eq/kg	Europe without CH: 0.00043346 RoW: 0.00046746	Ecoinvent v. 3.9.1, 2022: market for water, deionised		
Magnesium oxide	kg CO₂eq/kg	2.0728	Ecoinvent v. 3.9.1, 2022: market for magnesium oxide (GLO)		
Process water	kg CO₂eq/kg	Europe without CH: 0.00030884 RoW: 0.0012409	Ecoinvent v. 3.9.1, 2022: market for tap water		

Electricity consumption from grid (electricity mix)

Input	Unit	Standard factor	Source, description		
Argentina	kg CO₂eq/kWh _{el}	0.38912	Ecoinvent v. 3.9.1,2022: electricity, high voltage, production mix (AR)		
Brazil	kg CO2eq/kWh _{el}	0.15704	Ecoinvent v. 3.9.1,2022: market group for electricity, high voltage (BR)		
China	kg CO2eq/kWh _{el}	0.94077	Ecoinvent v. 3.9.1,2022: electricity, high voltage, production mix (CN)		
Indonesia	kg CO2eq/kWh _{el}	1.1202	Ecoinvent v. 3.9.1,2022: electricity, high voltage, production mix (ID)		
Malaysia	kg CO2eq/kWh _{el}	0.80353	Ecoinvent v. 3.9.1,2022: electricity, high voltage, production mix (MY)		
Thailand	kg CO₂eq/kWh _{el}	0,765	Ecoinvent v. 3.9.1,2022: electricity, high voltage, production mix (TH)		
Energy consumption from internal production					
Heat/electricity from CHP (diesel)	kg CO₂eq/MJ kg CO₂eq/kWh	heat: 0.035576 electricity: 0.78164	Ecoinvent v. 3.9.1,2022: Heat and power co-generation, diesel, 200kW electrical, SCR-NOx reduction (RoW)		
Heat/electricity from CHP (NG)	kg CO₂eq/MJ	RoW heat: 0.027909	Ecoinvent v. 3.9.1,2022: Heat and power co-generation, natural gas, 1MW electrical, lean burn		
	kg CO₂eq/kWh	RoW electricity: 0.59214			
	kg CO₂eq/MJ	Europe without CH heat: 0.029527 Europe			
	kg CO₂eq/kWh	without CH electricity: 0.62646			
Heat from boiler (hard coal)	kg CO₂eq/MJ _{th}	0.13182	Ecoinvent v. 3.9.1, 2022: heat production, at hard coal industrial furnace 1-10MW (Europe without CH)		
Heat from boiler (light fuel oil)	kg CO ₂ eq/MJ _{th}	0.098862	Ecoinvent v. 3.9.1, 2022: heat production, light fuel oil, at industrial furnace 1MW (RoW)		

Input	Unit	Standard factor	Source, description
Heat from boiler (lignite)	kg CO₂eq/MJ _{th}	0.17958	Ecoinvent v.3.9.1, 2022: heat production, lignite briquette, at stove 5-15kW (Europe without CH)
Heat from boiler (NG)	kg CO₂eq/MJ _{th}	Europe without CH: 0.075656 RoW: 0.074026	Ecoinvent v. 3.9.1, 2022: heat production, natural gas, at industrial furnace >100kW
Liquefied petroleum gas (LPG)	kg CO₂eq/kg	Europe without CH: 1.0537 RoW: 0.98469	Ecoinvent v. 3.9.1, 2022: market for liquefied petroleum gas
Solar electricity	kg CO₂eq/kWh _{el}	0.073504	Ecoinvent v. 3.9.1, 2022: Electricity production, photovoltaic, 3kWp flat-roof install. multi-Si (RoW)
Waste wood	kg CO₂eq/kg	0.048037	Ecoinvent v. 3.9.1, 2022: treatment of waste wood, post- consumer, sorting and shredding (RoW)
Wind electricity	kg CO₂eq/kWh _{el}	0.014748	Ecoinvent v. 3.9.1, 2022: Electricity production, wind, 1- 3MW turbine, onshore (RoW)
Electricity product	tion in conventio	onal power pla	nts
Electricity (heavy fuel oil)	kg CO ₂ eq/kWh _{el}	1.0022	Ecoinvent v. 3.9.1, 2022: electricity production, oil (RoW)
Lignite in Steam Turbine	kg CO₂eq/kWh _{el}	1.29	Ecoinvent v. 3.9.1, 2022: electricity production, lignite (RoW)
NG in Combined Cycle Gas Turbine	kg CO₂eq/kWh _{el}	0.47	Ecoinvent v. 3.9.1, 2022: electricity production, NG (RoW)
Waste treatment			
EFB and POME Co-composting	kg CO₂eq/kg CPO	0.03	Stichnothe et al. 2010 doi: 10.1007/s11367-010-0223-0
	kg CO₂eq/kg POME	0.01	
	kg CO ₂ eq/kg CPO ²⁹	0.51	BLE, 2010, Guideline Sustainable Biomass Production

²⁹ CPO: Crude Palm Oil

Input	Unit	Standard factor	Source, description
POME ²⁸ treatment in open ponds	kg CO₂eq/kg POME	0.16	BLE, 2010, Guideline Sustainable Biomass Production. 3.25 kg POME per kg CPO
POME treatment in closed ponds and flaring of emissions	kg CO₂eq/kg CPO	0	Biogenic CO ₂ set to zero, No CH4, N ₂ O if pond appropriately covered without any leakages, methane is properly captured
POME treatment in open ponds with belt press	kgCO2eq/kg CPO	EF open ponds (kg CO ₂ eq/kg CPO) – (Carbon belt press cake (kg C//kg belt press cake) * Annual average belt press cake production (kg) * 30.59 (kgCO ₂ eq)/ Annual average CPO production (kg))	Enström et al., 2018, doi: 10.1007/s10668-018-0181-4
Wastewater treatment	kg CO₂eq/cbm	Europe without CH: 0.36367 RoW: 0.27207	Ecoinvent v. 3.9.1, 2022: market for wastewater, average

²⁸ POME: Palm Oil Mill Effluent



October 16, 2024

Ms. Rajinder Sahota Deputy Executive Officer Climate Change and Research California Air Resources Board 1001 I St Sacramento, CA 95814

Re: Comments on Modifications to the Proposed Low Carbon Fuel Standard Amendments Issued October 1, 2024

Dear Ms. Sahota:

The Renewable Fuels Association (RFA) appreciates the opportunity to comment on the modifications to the proposed Low Carbon Fuels Standard (LCFS) amendments released on October 1, 2024, as the Second 15-day Changes to Proposed Regulation Order. 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.

RFA has commented extensively over the last three years during the California Air Resources Board's (CARB) process of modifying and updating the LCFS program. Most recently, we provided comments on the first 15-day Changes to Proposed Regulation Order released on August 12, 2024, which should be considered in conjunction with this letter and are attached here for reference.

The Proposed Sustainability Requirements are Unnecessary for U.S.-Produced Ethanol and Are Unworkable as Proposed.

254.1 Concern about a "rapid expansion of biofuel production and biofuel feedstock demand" was CARB's stated rationale for including sustainability requirements in the proposed LCFS amendments. However, RFA has repeatedly substantiated in our comments that U.S. corn ethanol is not undergoing and does not pose a threat of rapid expansion and, therefore, the sustainability requirements should not apply to it.

Yet, CARB has been completely unresponsive to this evidence. There is a clear lack of accountability in CARB's process for incorporating stakeholder comments into its rulemaking process, as demonstrated by its continuing to subject ethanol to sustainability requirements even as those requirements have grown more stringent in successive versions of the proposal.

RFA also detailed in its previous comments that the sustainability requirements are not only unjustified but also unworkable. The second 15-day proposed changes only make matters worse.

254.2 In section 95488.9(g)(2), CARB states, "Biomass must be cultivated and harvested in accordance with all local, State and federal rules and permits." Otherwise, "the finished fuel developed from ineligible biomass must be assigned the CARBOB carbon intensity for ethanol produced using uncertified biomass." While it is the expectation of ethanol producers that their feedstock suppliers comply with all relevant rules and permits, this is outside of the knowledge or control of the ethanol producer, and it is up to the relevant local, state or federal agencies to enforce.

In section 95488.9(g)(3) that was added in the first 15-day changes, CARB prescribed "best environmental management practices" that must be followed by feedstock producers starting in 2031. Now, after the second 15-day changes, CARB would effectively be acting as the enforcer of "rules and permits" in other jurisdictions—a role for which it is doubtful CARB has the authority.

254.3

Notably, this overreaching language doesn't limit the rules and permits to environmental or sustainability criteria. In theory, if a farmer were out of compliance with a labor rule and the ethanol producer did not detect this and avoid purchasing his/her corn, the resulting ethanol would be subject to a punitive CI score. This is just one example. CARB should seriously reconsider such a broad and sweeping mandate that could result in an invalidation of LCFS credits due to an unrelated violation that occurs outside of both a fuel provider's control and CARB's jurisdiction.

254.4 By adding this provision, CARB is "piling on" to requirements that were already largely unworkable for reasons RFA detailed in its August 27 comments on the first 15-day changes. If the sustainability requirements are implemented as proposed, the practical result could be to make it infeasible for farmers, grain elevators, and biofuel producers to supply ethanol to California. California's citizens would pay more for gasoline, and greenhouse gas emissions would increase.

Accounting for Land Use Change Provisions Should be Subject to an Appropriate Public Rulemaking Process.

RFA has commented extensively on how the land use change (LUC) emissions estimates used for the LCFS are in serious need of updating. Yet, this was not included as a topic in the public workshops during the amendment process, and CARB did not include LUC revisions in its LCFS proposal. Instead, in the first 15-day comment package, CARB included broad new discretion for the Executive Officer to unilaterally adjust LUC factors for existing pathways and to assign new LUC factors for feedstock/fuel combinations not included in the current lookup table. RFA noted in its August 27 comments that the language in section 95488.3(d) was overly vague and that it appeared to allow new discretion for the Executive Officer to unilaterally increase LUC factors but not decrease them. However, no material clarifications or modifications were made to this section in the second 15-day package.

254.5 cont.

Given the magnitude of the implications of the LUC provisions, it seems inappropriate and outside of the bounds of California regulatory guidelines for CARB to make unilateral changes to LUC factors without following a well-defined process, including public workshops and a formal rulemaking. Additionally, greenhouse gas reductions from climate-smart agricultural practices should be incorporated into the LCFS the next time LUC emissions are considered. When carbon deficits are assessed for LUC without the very real and offsetting credits generated from improved agricultural practices, it unfairly disadvantages the use of biofuels to meet the LCFS.

Thank you for the opportunity to submit these comments. RFA looks forward to working with CARB board members and staff to move the LCFS program forward.

Sincerely,

Scott Richman Chief Economist

ATTACHMENT



August 27, 2024

Ms. Rajinder Sahota Deputy Executive Officer Climate Change and Research California Air Resources Board 1001 I St Sacramento, CA 95814

Re: Comments on Modifications to the Proposed Low Carbon Fuel Standard Amendments Issued August 12, 2024

Dear Ms. Sahota,

The Renewable Fuels Association (RFA) appreciates the opportunity to comment on the modifications to the proposed Low Carbon Fuels Standard (LCFS) amendments released on August 12, 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.

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 August 12 proposal and should be considered in conjunction with our other comment letters. In particular, we are attaching to this letter the comments we submitted regarding the April 10, 2024, LCFS workshop in order to ensure that they are part of the formal record.

Approval of E15 Is Necessary to Meet the Proposed Increase in Compliance Stringency at the Lowest Practical Cost to California Consumers

In our last comment letter, RFA supported an increase to a 9% one-time step-down in the compliance curve, contingent on a commitment from CARB to begin the regulatory process to approve E15. While the modifications to the proposed LCFS amendments do include the 9% step-down, a schedule for a rulemaking to approve E15 has not been released.

As RFA has pointed out multiple times, limiting ethanol to a 10% blend not only locks in a 90% petroleum dependence in the gasoline market with myriad negative environmental and public health consequences, but it also severely limits needed credit generation in the gasoline pool. The proposed caps on soybean and canola oil-derived biomass-based diesel (BBD) are likely to slow the generation of excess LCFS credits in the diesel pool that have been used to cover ever-increasing cumulative net LCFS deficits in the gasoline pool. E15 is a critical near-term strategy for decarbonizing liquid fuels, which will continue to dominate transportation in California for years, if not decades, to come.

From a consumer perspective, E15 offers a unique opportunity to lower the cost of gasoline while cutting emissions of greenhouse gases and criteria pollutants. California drivers could save \$0.20 per gallon if the state allowed gas stations to sell E15 fuel, according to a new study authored by David Zilberman, PhD, a distinguished professor in the Agricultural and Resources Economics Department at the University of California, Berkeley, and Scott Kaplan, PhD, assistant professor in the Economics Department at the U.S. Naval Academy.¹ The study found that the potential savings for California consumers could reach \$2.7 billion annually and that "low-income commuters may stand to gain the most from a transition towards E15," given their propensity to have longer commutes and less fuel-efficient vehicles.

California is the only state in the U.S. that has not approved E15. The state's failure to approve the use of E15 essentially amounts to a gas price hike at a time when hard-working Californians can least afford it.

SB 32, which extended the goals of California's groundbreaking AB 32 legislation, is clear in the mandate for CARB to adopt rules and regulations to "achieve the maximum technologically feasible and cost-effective greenhouse gas emissions reductions." Expeditiously approving E15 use in California is consistent with that directive and necessary for CARB to comply with state clean-air policies, bringing significant environmental, health, and cost benefits to California citizens.

The Primary Rationale for Introducing Biomass Sustainability Requirements in the LCFS Amendments No Longer Exists

During public workshops held in 2022 and 2023 regarding potential changes to the LCFS, CARB openly considered whether any measures should be taken in response to the growth in the use of crop-based feedstocks for BBD. In the workshop on July 7, 2022, staff noted that CARB had received feedback in which it was "[r]ecommended that CARB set an upper limit on biofuel volumes from lipid-based feedstocks."² For CARB's February 22, 2023, workshop, the staff presentation contained three slides showing increases in BBD and related crop-based feedstock usage and then asked, "Are there regulatory mechanisms staff should consider?"³

Rather than imposing a lipid "cap," CARB established feedstock sustainability requirements in the proposed LCFS amendments issued in December 2023. In the Crop-Based Biofuels Sustainability Criteria section of its Initial Statement of Reasons,

¹ <u>https://d35t1syewk4d42.cloudfront.net/file/2823/Impact%20of%20Introducing%20E15%20in%20California%207-9-24.pdf</u>

² https://ww2.arb.ca.gov/sites/default/files/2022-07/LCFSWorkshop_Presentation.pdf

³ https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/lcfs_meetings/LCFSpresentation_02222023.pdf

CARB explained, "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."⁴

However, in the 15-day changes to the proposed amendments issued on August 12, 2024, CARB reversed course and capped the generation of credits for BBD from "virgin soybean oil and canola oil" at 20% of annual BBD volumes on a company-wide basis. Yet, CARB did not remove the sustainability requirements, even though they were intended to accomplish the same objective. Instead, CARB doubled down by making the requirements more onerous.

Certification Under the Proposed Sustainability Requirements Is Unnecessary for U.S.-Produced Ethanol

As discussed at length in the attached comments RFA submitted in response to the CARB workshop that was held on April 10, 2024, the risk that U.S. ethanol production will result in adverse outcomes of concern to CARB is essentially nonexistent.

As noted above, the proposed sustainability requirements were intended to reduce the risk associated with a *"rapid expansion* of biofuel production and biofuel feedstock demand." (Emphasis added.) However, fuel ethanol production has receded since 2018, and the market for ethanol in U.S. road transportation is mature. Moreover, total U.S. cropland has been declining for decades, and the entire increase in U.S. corn production since 2007 has come from rising yields (and switching acreage from other crops), not expanding crop area.

This was implicitly acknowledged by CARB. In the Crop-Based Biofuels Sustainability section of the staff presentation to the April workshop, which was held four months after the proposed amendments were issued, all six of the charts focused on BBD and related feedstocks, especially soybean oil. In the Topics for Discussion slide in that section, the first three bullets addressed BBD and related feedstocks. Notably, however, CARB asked, "Should E15 be considered to help reduce retail gasoline costs?" This indicates that the same concerns did not extend to ethanol.

The Latest Version of the Sustainability Requirements Is Unjustifiably Onerous and Likely Unworkable, Which Could Have Ramifications for the State's Fuel Supply

The sustainability requirements are scheduled to be phased in over time. Starting in 2026, biofuel producers "must maintain attestations … and geographical shapefiles or coordinates of plot boundaries (farm, plantation or forest) that are managed to produce the biomass with the annual fuel pathway report."⁵ However, even this initial phase will be difficult for some ethanol producers and unworkable for others.

⁴ https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/isor.pdf

⁵ https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/15day_atta-1.pdf

For those ethanol producers that predominantly originate corn and sorghum directly from farmers, a typical facility will buy grain from hundreds of growers. And, for those producers that purchase a significant share of their feedstock from grain elevators, the complications of complying with the requirements would be compounded.

Not all farmers will want to share their shapefiles/coordinates with ethanol producers or elevators, and land sales and shifts in rentals from year to year would make it challenging to ensure that all records are up to date. Often, elevators and the grain-purchasing areas of ethanol plants are sparsely staffed and have basic computer systems, and elevators operate on razor-thin margins, making it unattractive to incur additional costs that do not come with associated revenues.

Additionally, an officer of each ethanol company will be required to sign an attestation *under penalty of perjury* that "the biomass used to produce [the fuel] is sourced from land that was cleared or cultivated prior to January 1, 2008, and actively managed or fallow, and non-forested since January 1, 2008. Biomass has not been sourced from land that is protected by international or national law or by the relevant competent authority for nature protection purposes." He or she must "further certify that geographical shapefiles or coordinates of plot boundaries (farm, plantation or forest) accurately represent the source of biomass used under this fuel pathway."

However, ethanol facility employees will not have firsthand knowledge of the land history and field dimensions of farms where the feedstock was produced, and they will likely be extremely reluctant or unwilling to sign such an attestation. This requirement is unlike the one for specified source feedstocks (e.g., waste fats, oils, and greases), where suppliers, who are directly responsible for and knowledgeable about the origin and handling of the materials, are required to provide the attestations.

Starting in 2028, biofuel producers are required to meet chain-of-custody requirements similar to those for specified source feedstocks, including feedstock transfer documents. In the case of corn, a highly efficient elevator system, in which grain from numerous origins is commingled, has evolved over decades if not longer. For an ethanol plant that sources a significant share of its grain from one or more elevators (i.e., an elevator is the "first gathering point"), having to "show shipments of feedstock type and quantity directly from point of origin to the fuel production facility" is not workable, at least without receiving a premium for ethanol that would offset the cost of setting up and operating an identity-preservation system. Using a mass-balance approach would at least be theoretically possible, but "material balance or energy balance systems that control and record the assignment of input characteristics to output quantities at relevant points along the feedstock supply chain between the point of origin and the fuel production facility" are not currently in place.

However, some farmers and elevators would not want to go through the extra effort associated with the 2026 and 2028 requirements and would instead sell their grain into other market channels (e.g., for livestock feeding or exports) rather than ethanol. As

discussed in RFA's comments on the April 2024 workshop, if California moves ahead with any feedstock certification program, there should be a provision to designate all U.S.-produced ethanol as already in compliance, so long as aggregate cropland area does not expand beyond a 2007 baseline. This would be consistent with the EPA's approach under the federal Renewable Fuel Standard.

The final set of sustainability requirements to be implemented in 2031 would be extremely onerous for ethanol facilities' purchases of feedstock directly from farmers and completely unworkable for purchases through grain elevators. While the objective underlying the requirement that feedstock "be produced according to best environmental management practices" might be commendable, the four sustainability areas that are addressed (biodiversity, soil quality, "contamination" from fertilizers and other inputs, and water quality) are all-encompassing for farm operations yet barely defined in the CARB proposal.

In 2023, 1.34 billion gallons of corn- and fiber-based ethanol were used in California toward the LCFS.⁶ This represented 8.6% of the ethanol produced in the U.S. During the 2023/24 crop-marketing year, USDA estimates that 35.5% of the U.S. corn crop will be used for ethanol and coproducts.⁷ This means that the equivalent of 3.0% of the U.S. corn crop is used to produce ethanol consumed in California. Given the Advanced Clean Cars II program, it is likely that less ethanol will be consumed in California in 2031—especially if it remains the only state not to allow sales of E15 blends—while corn yields will continue to increase. As a result, on the present trajectory, well under 3% of the U.S. corn crop will be used to provide ethanol to California in 2031.

As a result, a large majority of farmers would have the option not to incur the additional effort and cost of complying with the California sustainability requirements. They are supplying commodity corn that is not receiving a premium, so why would they choose to sell it at a lower profit with a higher administrative burden? They could simply sell it into livestock feeding or export channels—or even to ethanol plants that are not shipping to California.

The same applies to grain elevators. They typically buy from local farmers or from smaller elevators and then commingle the corn that they receive. They do not necessarily know in advance which farms they will originate/handle corn from—and if they buy from a feeder elevator, they might never know. Elevators would suddenly be in the position of having to stipulate in advance to farmers the production practices that must be followed, in addition to undertaking the additional recordkeeping. Again, they are supplying commodity corn that is not receiving a premium, so why would they choose to sell it at a lower profit with a higher administrative burden?

The situation would be exponentially more difficult in a drought year. An ethanol plant in a drought area can have to buy substantial quantities of corn from a distant elevator, rather than purchasing from local farmers and elevators with which they usually do

⁶ https://ww2.arb.ca.gov/resources/documents/low-carbon-fuel-standard-reporting-tool-guarterly-summaries

⁷ https://www.usda.gov/oce/commodity/wasde/wasde0824.pdf

business. The shift in suppliers is unexpected, so there is no ability to retroactively have the distant elevator inform growers in the area that they will need to meet California's environmental requirements that season.

All of this could cause some ethanol producers to have great difficulty complying with the sustainability criteria in 2028 and 2031—or they could simply not want to incur the potential exposure associated with noncompliance and particularly with signing the attestation. Therefore, they might decide not to sell ethanol to California. From the state's perspective, this could cause volume constraints and price increases in the gasoline pool at a time when California is already concerned about how to avoid problems in the liquid fuel supply during the transition to ZEVs.⁸

If the state is going to consider sustainability criteria, it would be far more reasonable for those to be implemented as part of a program that allows greenhouse gas-reducing feedstock production practices to be recognized in determining the carbon intensity (CI) of the resulting biofuels—after an extensive process of consultation with industry. This would provide an opportunity for a premium to be received for feedstock that would at least offset the additional cost and effort incurred by farmers, elevators, and biofuels producers. It is worth noting that at the federal level the Inflation Reduction Act provided billions of dollars to incentivize farmers to undertake climate-smart agriculture practices, rather than simply mandating that they follow such practices, in order to dramatically kickstart adoption where it was not already occurring.⁹

The New Language Regarding Land Use Change Is Unclear and Potentially Problematic

In the proposed amendments, a column labeled 2015 Region of Analysis was added to Table 6, Land Use Change Values for Use in CI Determination. Ostensibly, this was done to assist in the determination of a land use change (LUC) "value appropriate to use for a region/feedstock/fuel combination not currently listed" in the table.

However, CARB also added the following language about LUC as section 95488.3(d)(2):

The Executive Officer may determine that no value in Table 6 is conservatively representative of a particular region/feedstock/fuel combination and assign a more conservative LUC value. Such determination must be based on the best available empirical data, including but not limited to satellite-based remote sensing data for land cover monitoring, crop yields, and emission factors from the AEZ-EF model or carbon stock datasets. For feedstocks not listed in Table 6, the Executive Officer may determine and assign an appropriate LUC value based on empirical land cover data, crop yields, and emission factors.

⁸ <u>https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/oil/081624-californias-governor-looks-to-regulate-gasoline-price-shocks-during-the-energy-transition-period</u>

⁹ https://www.usda.gov/media/press-releases/2024/08/16/fact-sheet-celebrating-two-years-inflation-reduction-act

The first sentence in the section is open-ended, and only the last sentence refers to a factor (limited to feedstock) that is not listed in Table 6. In order to ensure that this provision cannot be interpreted more broadly, CARB should add language at the beginning of section 95488.3(d)(2) specifying that it only applies to region/feedstock/fuel combinations not listed in Table 6.

It is also notable that the section appears to allow new discretion for the Executive Officer of CARB to unilaterally increase LUC factors but not decrease them. RFA and many other stakeholders have documented how the existing LUC factors for corn ethanol are overstated and should be revised downward.

RFA and others have also provided analysis demonstrating that modern farming practices are capable of significantly decreasing feedstock CI. The federal government is recognizing these benefits in the regulatory framework for tax credits under the Inflation Reduction Act, and CARB should finally move forward with similar recognition under the LCFS.

Thank you for the opportunity to submit these comments. RFA looks forward to working with CARB board members and staff to strengthen and extend the successful LCFS program.

Sincerely,

Scott Richman

August 27, 2024

Chair Liane Randolph & Members of the Board California Air Resources Board 1001 I Street Sacramento, CA 95814

Via electronic submission

Re: Proposed 15-Day Changes to the Proposed Regulation Order

Dear Chair Randolph and Members of the California Air Resources Board,

On behalf of the Kentucky Soybean Association (KSA), thank you for the opportunity to comment on the proposed 15-day changes (15-Day Changes) to the Low Carbon Fuel Standard (LCFS) program. KSA represents soybean farmers across Kentucky on public policy issues important to the soybean industry. Growers across Kentucky have long been committed to producing the world's food, feed, fuel, fiber, and thousands of bioproducts in an environmentally and economically sustainable way.

255.1 CARB's 15-Day Changes to revise the LCFS was quite surprising, as the final package diverged significantly from what was included in the Initial Statement of Reasons (ISOR) and the April 10 public workshop. Of top concern for farmers across our state and the rest of the nation is a proposal that would cap the use of soybean oil and canola oil as feedstocks for biofuels at 20 percent by company.

Placing an artificial limit on the market, combined with the inclusion of sustainability guardrails, as proposed will fail to reduce emissions and will only increase costs. Kentucky farmers remain frustrated that CARB insists on using data and methods that are over two decades old to set carbon intensity (CI) scores for soy, while refusing to consider new economic data and failing to consider the potential indirect emission impacts their expanding preference for waste is having.

KSA opposes the proposed discretionary authority provided to the Executive Officer to stop
 accepting new pathways for biomass-based diesel. In addition to discriminating against
 the lipid-based fuel platform, we are concerned this could have unintended impacts for
 non-lipid pathways which could produce biomass-based diesel as a co-product. We are
 also concerned that the aggressive step-down of CI benchmarks, which partially result
 from the removal the proposed regulation of fossil jet fuel, combined with other changes,
 will reward importers of waste feedstocks while penalizing farmers across Kentucky and
 the broader United States.

As CARB seeks to finalize updates to the LCFS program in the coming months, we strongly encourage the agency to ensure these updates are based on science as required by AB-32. The determination to make such drastic changes to previous CARB proposals so late in the game was shocking to the soybean and biofuels industries. For CARB to move from arguing that, based on the modeling, a vegetable oil feedstock cap was detrimental to the goals of the LCFS at the April public workshop, to now recommending a wildly stringent cap on those feedstocks without data or science, is quite difficult to comprehend. CARB's own April 10 analysis showed that a feedstock cap would increase greenhouse gas (GHG) emissions in California, which is contrary to requirements in AB-32.

Vegetable Oil Feedstock Cap

The inclusion of a virgin vegetable oil feedstock cap in the 15-Day Changes was alarming to farmers and the entire biofuels value chain, as reflected in market activity. You may understand our surprise based on the April 10 workshop in which CARB noted that liquid fuels would continue to be needed in the transportation sector in California for at least the next decade. In that same workshop, CARB also argued that the imposition of a virgin vegetable oil feedstock cap would increase the utilization of petroleum diesel in the transportation sector. In the staff's own presentation on April 10, staff noted that nearly eighty percent of vehicles on the road in California will still use combustion engines by 2030. Further, they noted that such a stringent cap on virgin vegetable oils may result in 2.8 billion gallons of fossil diesel utilization in 2030, versus 1.9 billion gallons using a scenario that does not impose the cap proposed by the Environmental Justice Advisory Committee.

In a full reversal of staff's prior analysis, which concluded only four months ago, staff is now essentially recommending to the board that more fossil diesel be sold into the market in 2030. This recommendation appears to not only go against the goals of AB-32, but also science. This recommendation seems to flatly disagree with the Intergovernmental Panel on Climate Change, which notes in its sixth assessment report that using existing low carbon technologies is a crucial component to avoiding catastrophic temperature increases, stating that "biodiesel and renewable diesel fuels...could offer important nearterm reductions" for several technologies, including buses, rail, and long-haul trucking.¹

In its current interpretation, the cap may lock out of the market producers of the lowest cost, lowest carbon intensity soybean oil-based biofuel (soy methyl esters). Most soy methyl esters are produced at biodiesel plants adjacent to soybean processing plants. Often, the companies which own/operate these soybean processing facilities are not involved in the procurement and processing of non-crop-based oils, such as UCO and tallow. They exclusively make biofuels out of soy oil or canola oil. The current language

255.8

¹ Jaramillo, P., S. Kahn Ribeiro, P. Newman, S. Dhar, O.E. Diemuodeke, T. Kajino, D.S. Lee, S.B. Nugroho, X. Ou, A. Hammer Strømman, J. Whitehead, 2022: Transport. 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. https://report.ipcc.ch/ar6wg3/pdf/IPCC_AR6_WGIII_FinalDraft_Chapter10.pdf

- 255.8 limits crediting of soy and canola to 20 percent of reported gallons. This leaves integrated cont. agriprocessing/biofuel producers two choices: 1) exit the market entirely, or 2) be denied a government benefit on 80 percent of their fuel. If this is the current interpretation of the proposed provision, it would significantly and arbitrarily disadvantage the sustainable oilseed biodiesel community.
- 255.9 We echo the concern of the American Soybean Association that the new requirement appears to contradict the cost-minimizing statutory guidance laid out in AB-32.

Sustainability Guardrails

255.10 KSA was surprised to find that not only was a feedstock cap in the 15-Day Changes, but the sustainability guardrails were also retained. The cap, sustainability guardrails and Indirect Land Use Change score all additively, and redundantly, address land use change. This has the equivalent effect of giving soy and canola a much higher CI score increasing the compliance cost associated with delivering the product, despite the lack of direct evidence.

Broadly we are concerned that the requirement proposed by CARB is unneeded given the longstanding, excessively high ILUC figure (relative to more recent modeling efforts). Furthermore, we are extremely disheartened that CARB has not followed the example of governments across North America, where farmers who submit data for compliance are also given the opportunity to be incentivized for conservation efforts. This additional cost without benefit contradicts language authorizing the LCFS. Section 38562 (b)(7) of AB-32 directs CARB to, "Minimize the administrative burden of implementing and complying with these regulations." Adding supply chain traceability to a bulk delivery system adds significant administrative burden without changing the GHG emissions of the pathway.

255.12

255.11

CARB's efforts could be improved and enhanced by outreach to U.S. Department of Agriculture (USDA) personnel who have engaged in activity regarding climate-smart farming practices. USDA recently closed a comment period on its Request for Information on Procedures for Quantification, Reporting, and Verification of Greenhouse Gas Emissions Associated with the Production of Domestic Agricultural Commodities Used as Biofuel Feedstocks. With the information received, USDA seeks to quantify and qualify the benefits of climate smart agriculture practices for biofuel programs at the state, national, and international level. Communication between CARB and USDA could be enlightening regarding ongoing agricultural sustainability practices.

Through the current sustainable aviation fuel (SAF) federal tax credit (40B), the CI of soybased biofuels can improve through no-till and cover cropping on the field that the soybeans were produced. Other farming practices like low-till, nutrient management, enhanced efficiency fertilizers, buffers, wetland and grassland management, tree planting on working lands, planting for higher carbon sequestration, and soil amendments all can and should be accounted for to assign a lower CI score to an agricultural feedstock. USDA

- 255.12 cont. In addition, there are a variety of other practices that scientifically lower the CI score of soybean feedstocks for biofuels, and USDA is actively working to develop mechanisms to account for those.
- 255.13 Given the work being undertaken by USDA and EPA as part of the implementation of the Inflation Reduction Act, KSA urges CARB to reconsider its proposed sustainability requirements to allow soybean growers the opportunity to participate in the California biofuels market through innovative and climate smart agriculture practices.

Outdated Scoring

For the last several years, state soybean associations, national associations, and biofuel producers have urged CARB to consider updating its scoring methodology for crop-based biofuels. CARB has refused to even consider the request.

> We remain deeply concerned that without a comprehensive update to the Global Trade Analysis Project model for biofuels (GTAP-BIO) that CARB utilizes, soy-based feedstocks will be phased out of the LCFS even without the additional limitations being proposed in the 15-Day Changes. Current data indicates a much lower CI score for soybeans, as growers continue to improve soil practices, limit water use, lower on-farm emissions and more. On the one hand, CARB is recommending stringent sustainability guardrails for U.S. soy, but on the other hand is still on track to likely phase-out soy-based biofuels from credit generation by approximately 2035 or sooner.

> CARB has indicated plans to update all major models for lifecycle emissions calculations except for GTAP-BIO in the updated LCFS rulemaking. 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 soybased 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 soybeans². 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 and capping virgin vegetable oil feedstocks, then the modeling should also be updated to reflect current land use change data.

² Taheripour, F., Karmai, O., and Sajedinia, E. (2023). *Biodiesel Induced Land Use Changes: An Assessment Using GTAP-BIO 2014 Data Base*. Purdue University

Entities Eligible to Apply for Fuel Pathways

We are concerned about CARB's 15-Day Changes to give the Executive Officer discretion to stop accepting new pathways for biomass-based diesel starting in 2031. We do not 255.15 understand what provision of AB-32 statue is served, or justifies, this arbitrary and highly selective change. CARB must, under statute, minimize costs and maximize GHG reductions. It is unclear how this is served by rejecting new pathways. In fact, the requirements of current law are met by allowing the most available pathways. If these pathways cannot achieve cost-effective GHG savings, they will not be utilized by the market in the LCFS. In essence, an increase in pathways can only serve to improve GHG benefits in California. Singling out a single fuel for prejudicial treatment is baffling given the goals of the LCFS and the authority that establishes it. Executive Order S-01-07 establishing the LCFS specifically cites diversity of fuels as a motivation for the program, and this proposal contradicts one of the stated purposes of the program. In addition, this provision (if implemented) could also significantly disadvantage other biofuel production processes which may produce biomass-based diesel as a co-product, for example in systems where SAF is a main product.

Conclusion

255.16 KSA is encouraged by the continued successes of programs that support the development of cleaner, low-carbon fuels. However, it is critical that CARB finalizes updates in a way that does not arbitrarily exclude agricultural feedstocks through policies that are not science-based and run afoul of CARB's mandate, including capping vegetable oil feedstocks and applying onerous sustainability guardrails that add cost without rewarding farming practices that lower CI.

255.18
 CARB's 15-Day Changes, released in August 2024, is deeply concerning. CARB has singled out soybean and canola oil for adverse, prejudicial treatment. No scientific evidence is ever given for this treatment. In fact, CARB has refused to update the science as required by law for these feedstocks. This alone calls into question the integrity of a performance-based LCFS. On top of this, CARB is now proposing feedstock caps, traceability requirements and authority to reject applications for these fuels produced from them. Again, CARB has not shown any scientific justification. In fact, the LCFS is already over-penalizing soy for any land use change requirements.

Farmers across Kentucky remain eager to continue working with CARB to support the role of agriculture in diversifying the fuel supply while reducing GHGs and increasing clean air 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 Am 20

Adam Hendricks Kentucky Soybean Association President and Logan County Soybean Farmer

October 16, 2024

256.1



Chair Randolph and Members of the Board California Air Resources Board 1001 I St. Sacramento, CA 95814

RE: American Biogas Council Comments on the Second 15-Day Changes to the Low Carbon Fuel Standard

Dear Chair Randolph and Members of the Board,

The American Biogas Council (ABC) appreciates the opportunity to comment on the second proposed 15-Day changes amendments to 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 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 renewable energy and soil products. All of this is an effort to protect our air, water, and soil – crucial parts of the solution our members provide to help California meet its environmental and climate goals. The technology-neutral and 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. These are foundational pillars of the program that cannot afford to be lost in future rulemakings.

The ABC is encouraged to see that CARB staff issued a second 15-Day changes package following the feedback received on the first 15-Day changes package, which was released on August 12, 2024. While the second 15-Day changes package focused on more targeted modifications to the proposed regulatory text, the ABC would like to express our general support for the new amendments to the program. More specifically, the ABC supports the modifications made in the second 15-Day changes to the auto-acceleration mechanism (AAM). Switching from a calendar year of data to the most recent four quarters of data as the determination for whether the AAM is triggered will allow for greater transparency and market certainty to LCFS participants.

Additionally, the ABC would like to express our approval of the addition of a temporary pathway for low-carbon intensity (CI) electricity produced by a fuel cell from biomethane from dairy or swine manure as well as the clarification on the temporary fuel pathway for hydrogen produced from dairy or swine biomethane. It is also our understanding that, in principle, the addition of this temporary pathway utilizing fuel cell technology is about uplifting non-combustion technologies, thus supporting other innovative, non-combustion technologies such as linear generators operating on renewable fuels.^{1,2} Similarly, the 15-day changes propose to allow for book-and-claim accounting of biomethane to produce electricity for

² California Energy Commission, *SB 423 Emerging Renewable and Firm Zero-Carbon Resources Report (Draft)*. August 2024. <u>https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=21-ESR-01</u>

¹ Assembly Bill 1921 (Papan, Chaptered 2024).

https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202320240AB1921

256.4 electric vehicle charging, but only if the electricity generated is from a fuel cell. Both of these modifications increase the application of biomethane beyond its traditional uses in other technologies. Recognizing the importance that biomethane has in advancing non-combustion technologies, such as fuel cells, is a critical part of the energy transition and will help California meet its climate goals.

The ABC, however, does not support the phaseout of avoided methane emission crediting in the 45-day package, nor the modified language regarding the requirements for crediting periods in the second 15-day changes. The second 15-Day changes package adjusts these requirements to state that a project certified

256.5 before the effective date of the regulation is allowed three consecutive 10-year crediting periods, and projects certified after the effective date of regulation or after January 1, 2030, will be limited to two consecutive 10-year crediting periods. The ABC believes that CARB should honor the dairy biomethane projects developed under the previous rules, specifically those that have received a temporary CI score before the new amendments go into effect, and allow these projects to be eligible for three consecutive 10-year crediting periods. There are two years of operating projects set to come online that were developed with the assumption that they were eligible for three consecutive 10-year crediting periods but will now be forced to have two consecutive 10-year crediting periods due to CARB's long wait times for project certifications. As stated in our August 27, 2024, comment letter, any changes to this system places these projects at a significant disadvantage, could potentially lead to shutdowns, and will certainly stifle investments in new projects going forward.³ Emission reductions continue to occur for the life of the methane capture project (i.e., the biomethane digester's asset life). Therefore, the crediting period for avoided emissions should mirror the asset life of the capture technology, which is greater than 20 years. Furthermore, the ABC would like to reiterate that we do not believe the addition of deliverability 256.6 requirements under the program is necessary. The ABC urges CARB to work with biomethane stakeholders to come up with a better solution for these issues.

As stated in our February 16, 2024, comment letter on the 45-Day package, the proposal indicates that a shortfall (i.e., a verified operational CI that is higher than the certified CI upon which project credits were generated) is subject to a "penalty" that is 4 times the spread for the applicable volume of fuel.⁴ The rationale for a 4X spread is unclear as a smaller spread (e.g., 2X) serves as a significant disincentive to producers for being overconfident in their analysis. The ABC asks CARB to explain their rational for including this provision and to consider a more balanced response that provides flexibility to consider situation-specific factors rather than defaulting to a 4X penalty.

Over the past two years, CARB staff have held numerous public workshops to gather feedback on potential changes to the program, where ABC participated, and we are happy to see that the rulemaking is nearing completion. As the technology in the transportation sector continues to evolve and advance
 towards lower carbon alternatives, ABC members are following suit and are ready to serve these new markets, such as alternative jet fuel (AJF), low-CI hydrogen, as well as exploring opportunities where biomethane can be utilized outside of transportation. As these markets continue to grow, the ABC asks CARB to remain mindful of the success of the historical framework of the program and to continue to apply it to newer pathways and technologies, including the use of avoided emissions and book-and-claim. Additionally, the ABC recommends that CARB, starting with the 2024 amendments to the LCFS, send a clear policy signal that biomethane is a necessary and effective decarbonization strategy in these other sectors (e.g., residential, commercial, industrial) that are fundamental to the state meeting its ambitious GHG reduction targets.

³ American Biogas Council Comments on the first 15-Day Changes Amendments to the Low Carbon Fuel Standard. August 27, 2024. <u>https://www.arb.ca.gov/lists/com-attach/7513-lcfs2024-ADIGNFdmVzwGMgl1.pdf</u>

⁴ American Biogas Council Comments on the Proposed Amendments to the Low Carbon Fuel Standard. February 16, 2024. <u>https://www.arb.ca.gov/lists/com-attach/7513-lcfs2024-ADIGNFdmVzwGMgl1.pdf</u>

256.10 Lastly, the ABC strongly urges the Board to swiftly adopt the amendments now. We would like to thank CARB staff for their hard work and persistence throughout this rulemaking, and we look forward to working with staff on these issues in the future.

Sincerely,

PALEST

Patrick Serfass, Executive Director


October 16, 2024

The Honorable Steven S. Cliff, Ph.D. Executive Officer California Air Resources Board 1001 I Street Sacramento, California 95814 The Honorable Liane M. Randolph Chair California Air Resources Board 1001 I Street Sacramento, California 95814

RE: Proposed Low Carbon Fuel Standard Amendments; Second Notice of Public Availability of Modified Text

Dr. Cliff and Chair Randolph:

NATSO, Representing America's Travel Centers and Truckstops, and SIGMA: America's Leading Fuel Marketers (together, the "Associations") represent more than 80 percent of retail sales of motor fuel in the United States.¹ On behalf of the diverse and forward-thinking retail fuel industry, we are eager to work with the California Air Resources Board ("CARB" or the "Agency") to advance policies that lower transportation emissions in California. This second iteration of 15-Day Changes (the "Proposed Amendments")², in concert with CARB's other recently proposed changes to the Low Carbon Fuel Standard ("LCFS"),³ threaten to unnecessarily stunt investment in clean fuels while simultaneously raising prices at the pump consumers.⁴

257.1 The Associations urge the Agency to modify the Proposed Amendments for heavy duty hydrogen refueling infrastructure ("HRI") by (i) removing the restrictions on credit generation tied to capital expenditure; and (ii) adjusting the proposed derating factor for HRI credits to 37.5 percent. The Associations also encourage the Agency to dispense with the Proposed Amendments that would cap soy-, sunflower-, and canola-based fuel credit generation under the LCFS, while maintaining the new, robust sustainability provisions that would apply to these crops.

¹ NATSO currently represents approximately 5,000 travel plazas and truckstops nationwide, comprising both national chains and small, independent locations. SIGMA represents a diverse membership of approximately 260 independent chain retailers and marketers of motor fuel. The retail fuels and convenience industry provide 2.38 million jobs at approximately 120,000 retail establishments across the country.

² "Second Notice of Public Availability of Modified Text and Availability of Additional Documents and/or Information, Proposed Low Carbon Fuel Standard Amendments", California Air Resources Board, (October 1, 2024), *available at* <u>https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/l5day_notice.pdf</u>

³ "Notice of Public Availability of Modified Text and Availability of Additional Documents and/or Information, Proposed Low Carbon Fuel Standard Amendments", California Air Resources Board, (August 12, 2024), *available at* <u>https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/l5day_notice.pdf</u>

⁴ The Associations previously filed extensive comments on the first iteration of 15-Day Changes proposed by the Agency in August, and encourage CARB to closely consider the fuel market implications detailed at length in those comments, in addition to the concerns outlined in this document. *See* NATSO, SIGMA comments (August 27, 2024), *available at* www.arb.ca.gov/lists/com-attach/7482-lcfs2024-AmxTNFwpUnJXPgJd.pdf.

I. The Proposed Amendments for Heavy Duty Hydrogen Refueling Infrastructure.

Many of the Associations' members – particularly those with highway locations that service heavy duty commercial trucks – are actively expanding their hydrogen capabilities in response to market- and federal policy signals. They have developed new commercial relationships with companies in the hydrogen value chain, actively participate in multiple "hydrogen hub" projects – including the ARCHES project in California – and are actively exploring hydrogen grant and loan guarantee opportunities.

Commercial decisions to invest in heavy duty vehicles will be grounded in economics. Businesses will not buy heavy duty electric or hydrogen vehicles at scale unless the total cost of operation is comparable to the cost of diesel-powered trucks. The cost of hydrogen is, by far, the most impactful component of a prospective consumer's total cost of ownership. Minimizing fuel costs should therefore be an essential element of any policy intended to decarbonize heavy duty trucking, including via hydrogen as a transportation fuel. As transportation energy retailers and distributors, our membership will rely upon hydrogen producers to provide an economical supply of clean hydrogen in the years ahead.

The LCFS should *maximize* the market's ability to realize these objectives. Any additional requirements or restrictions should be pursued only if they do not effectively preclude the industry from developing in the first place. The Proposed Amendments threaten to do precisely that.

The proposed derating factor for public HRI (50 percent), coupled with low station capacity requirements (set at 6,000 kilograms per day), will result in LCFS incentives being inadequate to prompt investments in heavy duty HRI in California. Unless rectified to ensure the viability of the HRI credits, the Proposed Amendments will fail to support the capacity necessary to achieve the Agency's decarbonization objectives. The Associations recommend a derating factor of *at most* 37.5 percent. A derating factor of 37.5 percent (62.5 percent capacity factor) will partially remediate the capital risk taken by heavy duty hydrogen station developers and encourage investment.

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The Agency has also proposed to restrict HRI credit generation by capping it at 1.5 times the capital expenditures ("capex"). The capex restrictions and derating factor are intended to serve identical purposes, but when combined, add considerable, unnecessary investment risk for developers. This will hinder the development of heavy duty hydrogen refueling stations that are vital for the state to achieve its low carbon goals. The Associations thus urge CARB to eliminate the 1.5x capex limitation and adjust the derating factor for heavy duty HRI to 37.5 percent.

II. The Proposed Cap on Certain Biomass-Based Feedstocks.

257.7 There is no environmental rationale for imposing company-wide 20 percent caps on credits for biomass-based diesel produced from virgin soybean, sunflower, and canola oil (the "Proposed

Cap").⁵ The LCFS is designed to reward the most environmentally compelling feedstocks through a progressive reduction in carbon intensity ("CI"). The Proposed Amendments would abandon this approach, representing a dramatic departure from the direction Agency staff has signaled throughout the workshop process. Indeed, CARB has worked extensively to develop robust feedstock sustainability provisions for soy-, sunflower- and canola-based fuels.

257.7 cont.

257.8

A structure under which fuels are no longer assigned a CI score based on their actual environmental attributes is antithetical to the stated purpose of the LCFS and decidedly undermines the Program's environmental integrity. The imposition of a cap on soy-, sunflower-, and canolabased feedstocks would also severely hinder the market's ability to satisfy the ambitious CI reduction targets included in the Proposed Amendments. The Proposed Cap will also expose California's transportation emissions to a small number of economically viable, low-carbon feedstocks, many of which are imported from overseas and thus exposed to protectionist policy changes now under consideration at the federal level.

Finally, the Proposed Cap on sunflower-based fuels is a violation of the California Administrative Procedures Act (the "APA"). The principle of fair notice is a fundamental underpinning of the California APA, and serves to ensure that regulated industries are able to engage meaningfully in the rulemaking process. Indeed, the APA requires a 45-day notice for any "substantial" changes to a proposal that are not "sufficiently related" to the original text.⁶ The addition of the Proposed Cap is both a substantial change and one that diverges significantly from the initial proposal. Limiting stakeholders to a 15-day comment period undermines the fair notice requirement and thus impedes the ability of the public to evaluate, and respond to, the Proposed Amendments.

III. Conclusion

Thank you for considering our perspective on these important topics. We would welcome the opportunity to further discuss these issues with you at any time.

Sincerely,

NATSO, Representing America's Travel Plazas and Truckstops SIGMA: America's Leading Fuel Marketers

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⁵ The "Proposed Cap" in this comment letter is used to refer to the proposed amendment to assess biomass-based diesel from virgin soybean ("soy"), sunflower, and canola oil in excess of 20 percent the carbon intensity of the applicable diesel pool benchmark for that year.

 $^{^{6}}$ See Cal. Gov. Code § 11346.8(c) ("No state agency may adopt, amend, or repeal a regulation which has been changed from that which was originally made available to the public pursuant to Section 11346.5, unless the change is (1) non-substantial or solely grammatical in nature, or (2) sufficiently related to the original text that the public was adequately placed on notice that the change could result from the originally proposed regulatory action.").



October 16, 2024

Carolyn Lozo Chief, Transportation Fuels Branch California Air Resources Board 1001 "I" Street Sacramento, CA 95814

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

Via electronic submission

Re: Proposed Low Carbon Fuel Standard 15-Day Changes

Transportation Fuels Branch Chief Lozo:

Thank you for the opportunity to comment in response to the California Air Resources Board's (CARB) additional modifications to the Proposed Amendments to the Low Carbon Fuel Standard (LCFS) Regulation (Second 15-Day Package or Proposal). The National Oilseed Processors Association (NOPA) appreciates the opportunity to provide additional insights.

NOPA continues to strongly urge CARB to reject the imposition of a vegetable oil cap and adopt NOPA's proposed targeted, risk-based approach to sustainability requirements which would not penalize sustainable U.S. fuels and feedstocks at the expense of increased foreign and/or fraudulent imports.

Background

Organized in 1930, the National Oilseed Processors Association (NOPA) represents the U.S. soybean, canola, flaxseed, safflower seed, and sunflower seed-crushing industries. NOPA's membership is 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's 17 member companies operate 70 softseed and soybean solvent extraction plants across 21 states, crushing over 95% of all soybeans processed in the United States, the equivalent to more than 2 billion bushels annually.

Soybeans are made of up of approximately 80% meal and 20% oil meaning as more oil becomes available for renewable energy use, even more meal will become available for food and feed use. NOPA members have been building capacity to process domestic row crops into biofuel feedstocks in line with state and federal renewable fuel provisions. NOPA members - and new entrants into the soy processing sector - have announced plans to invest approximately \$6 billion to expand U.S. crushing capacity by nearly 30% relative to 2023 installed capacity.

A Cap on Vegetable Oils Is Impractical and Could Bring Unintended Consequences

258.3 While CARB's proposal intends to diversify feedstock sources and promote sustainability, it will likely have the opposite effect. First and foremost, capping the use of vegetable oils will significantly increase fuel costs. Because vegetable oil is currently one of the most efficient and cost-effective feedstocks, limiting its use will constrain the supply of renewable diesel. Renewable diesel and biodiesel are crucial components of California's efforts to reduce greenhouse gas emissions and transition to cleaner energy sources. This artificial limitation will create a supply-demand imbalance, driving up the costs of renewable diesel production and, consequently, the price at the pump for consumers.

258.4 Moreover, reaching CARB's goal of 100% renewable liquid fuels with the proposed feedstock constraints in place is unrealistic and impractical. The proposed cap on vegetable oil usage risks stalling the progress made to reduce carbon emissions by creating a bottleneck in renewable diesel production. In fact, CARB's own analysis supports this assessment.

As shown in Figure 1, total biomass-based diesel (BBD) production from soybean and canola oil for the California market was 30% in the first quarter of this year and has been above CARB's proposed 20% cap since Q3 of 2022, while renewable diesel from soybean and canola oil has been greater than 20% since Q1 of 2021.



Figure 1

% of Veg Oils in BBD by Quarter

NOPA appreciates the inclusion of clarifications and improvements to the vegetable oil cap in the 2nd 15-Day Package. However, the market will be significantly challenged to maintain, much less increase, its current 72% displacement of fossil diesel demand, while simultaneously having to replace 10% of feedstock demand in three years. In fact, CARB came to the same conclusion when it presented its findings at the April 2024 workshop – that a vegetable oil cap will require more fossil diesel use in lieu of renewable diesel and

258.5

- 258.5 cont. biodiesel, stating that it "does not achieve the same level of NOx and PM2.5 emissions reductions as the proposed amendments and potentially exacerbates existing air quality challenges in the State."
- A 10% feedstock displacement rate will either not be possible, or so costly that it will be prohibitive. In cases where biodiesel production facilities are integrated with oilseed crush facilities, there are structural impediments to changes in feedstock which provides no feasible feedstock optionality. Taken together, these proposed feedstock restrictions will effectively create a decreasing volumetric cap as the price of compliance to maintain market access becomes cost prohibitive.
- 258.7 NOPA urges CARB to return to its previous position and oppose a cap on vegetable oil feedstocks. In its place, we continue to recommend policies that encourage the responsible production and use of renewable feedstocks while addressing concerns about deforestation through targeted risk-based measures.

CARB Should Officially Deem Canada's Clean Fuels Regulations Compliant

258.8

NOPA appreciates the mention of Environment and Climate Change Canada's Clean Fuels Regulations (CFR) in the 2nd 15-Day Package Notice as it relates to CARB's ability to remove or suspend certification systems. The implication of its inclusion would be that CARB intends to recognize certification systems approved under Canada's CFR, which NOPA strongly supports.

As NOPA previously submitted, for regions where crop-based feedstocks comply with another established sustainability system, such as the CFR, CARB should permit some level of mutual recognition. The CFR offers established frameworks for verifying sustainable practices and is a practical and effective way to achieve CARB's environmental goals without sacrificing any sustainability gains. Consequently, NOPA urges CARB to officially recognize the CFR as an approved certification system by including it in the Proposed Regulation Order under "Approved Certification Systems."

<u>CARB Should Take a Targeted Risk-Based Approach to Sustainability Requirements While Increasing Scrutiny</u> of Waste Feedstocks

258.9 As NOPA previously submitted, 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.

In addition, for regions where crop-based feedstocks comply with another established sustainability system, such as the Renewable Fuel Standard (RFS), Canada's CFR, or energy tax credit provisions in the Inflation
 Reduction Act (IRA), CARB should permit some level of aggregate compliance. These programs offer established frameworks for verifying sustainable practices and are a practical and effective way to achieve CARB's environmental goals without sacrificing any sustainability gains.

As NOPA's members have experienced with existing certification schemes, including those approved by the EU and Canada, farmers are extremely reluctant to provide additional data or sign attestations. This reluctance often requires processors to build education campaigns which can take a significant amount of time to fully capture a supply chain.

258.11 Further, a 2026 implementation date for the first phase of sustainability criteria does not account for the growing cycle of agricultural feedstocks. 2026 crop-based feedstocks need to be planted in the spring of

- 258.11 2025, which means farmers are purchasing inputs for that crop as we speak today. If delivery points for the next soybean crop will require data disclosure, producers need to know that now as they plan out their upcoming crops and lock in investments.
- In addition, CARB has not provided a clear definition of a farm, which raises significant implementation
 questions as farmers often farm disconnected parcels of land. Furthermore, farmers often store much of their crop to sell at a later date. Depending on how a farm is defined, it raises a further question of how on-farm storage will be handled.

In the event CARB is unwilling to deem U.S. and Canadian feedstocks compliant, CARB should, at a minimum,
 extend the implementation timeline for the sustainability criteria provisions beyond 2026 to account for the time necessary to cultivate feedstocks, obtain the data necessary for compliance, and acquire a sufficient number of farmer attestations.

NOPA members have also witnessed the impacts from limiting crop-based feedstocks and increased crediting
 for waste feedstocks under the Renewable Energy Directive (RED II). EU policymakers have struggled to
 address the subsequent impacts from fraudulent waste feedstocks,¹ while significant imports of Chinese
 biodiesel recently led the Commission to place substantial provisional import duties² of up to 36.4%.

At CARB's April workshop, staff noted additional measures under consideration to address potential fraud in sourcing waste feedstocks, including "additional detailed traceability, verification and/or enforcement of waste feedstocks to avoid fraud." Yet, both 15-Day Packages inexplicably failed to include any of those additional measures.

In addition, as previously noted, the proposal requires at least an additional 10% of waste feedstocks to offset the reduction in crop-based feedstocks, which, according to CARB's Recirculated Draft Environmental Impact Analysis (EIA), would "create an even stronger incentive to utilize waste feedstocks." Yet, the 2nd 15-Day Package was published without any additional analysis of direct or market-mediated effects from such a policy, nor any additional proposed compliance requirements to ensure waste feedstocks are not fraudulent.

NOPA continues to urge CARB's inclusion of enhanced traceability and enforcement measures on waste feedstock imports and maintains that a targeted, risk-based approach would streamline compliance requirements while ensuring that sustainability criteria are met. Recognizing biofuels produced in compliance with existing U.S. programs is a practical and effective way to achieve CARB's goals without sacrificing any sustainability gains. NOPA has and continues to support heightened scrutiny, oversight, and traceability to ensure the integrity of biofuels programs. NOPA believes origin disclosure and product makeup must be verifiable and traceable for imported feedstocks. NOPA strongly supports paperwork and in-person audits as well as testing where applicable.

Conclusion

258.18 In conclusion, CARB analysis, and market and scientific data collectively demonstrate that consideration of a cap or limitation on crop-based feedstocks is unwarranted and could further exacerbate the importation of potentially fraudulent foreign feedstocks.

¹ Kelly Norways, "<u>New biofuel data triggers fresh fraud concerns over EU imports,</u>" S&P Global, December 14, 2023 ²Kelly Norways, "<u>EU imposes anti-dumping duties targeting cheap Chinese biodiesel imports</u>," S&P Global, August 16, 2024

NOPA continues to encourage CARB to adopt 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. At a minimum, CARB should consider extending the implementation data of the sustainability criteria provisions to account for the real-world challenges of acquiring farmer data and attestations.

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 Kailee Tkacz Buller President & CEO NOPA

258.19



October 16, 2024

Liane Randolph, Chair California Air Resources Board 1001 I Street Sacramento, California 95814 Via electronic submission

Re: Second Notice of Public Availability of Modified Text and Availability of Additional Documents and/or Information for the Proposed Low Carbon Fuel Standard Amendments (Second 15-Day Notice)

Dear Chair Randolph:

Thank you for the opportunity to comment in response to the second 15-day proposed modifications to the Low Carbon Fuel Standard (LCFS) by the California Air Resources Board (CARB) on October 1. CHS appreciates the opportunity to share insights on behalf of our businesses and farmer-owners with interest in this issue.

CHS is a leading global agribusiness *owned by farmers, ranchers and cooperatives* across the United States. Diversified in energy, agronomy, grains and foods, CHS is uniquely positioned to provide expertise in the areas of agriculture commodities and liquid fuels.

CHS supplies farmer customers with more than 2.5 billion gallons of refined fuels annually, including diesel and gasoline. In addition, CHS operates soybean and canola processing facilities and two ethanol plants in the Midwest. With more than four decades of experience as a leading marketer of renewable fuels, CHS provides a critical link between grain farmers, ethanol manufacturers and biofuel blenders. The company is also one of the largest U.S. marketers of ethanol products, a leading marketer of biodiesel blended fuels and a growing participant in global liquid fuels imports and exports.

CHS comments are focused in three areas of the proposed LCFS amendments: vegetable oil cap, sustainability compliance requirements and fuel pathways. Implementation of a cap on biomass-based diesel (BBD) feedstocks, complex and duplicative sustainability requirements, and phaseout of BBD pathways will result in fuel price increases and poorer air quality.

Vegetable oil cap

Biodiesel and renewable diesel are LCFS credit generating fuels that are key components to California greenhouse gas emission (ghg) reductions. Limiting the availability of these fuels in the California LCFS market will create market volatility, reduce ghg emission reductions by excluding domestic production of low carbon renewable fuels and increase fuel prices for California consumers. CARB modeling illustrates this conclusion.



259.1 cont. At the April 10, 2024 CARB workshop, staff presented the implications of a vegetable oil cap including the impact to LCFS progress. Modeled in Alternative 1, fuel costs increased to \$162 billion more than a comparable policy scenario without a vegetable oil cap. With respect to ghg emissions, less renewable diesel volume from the artificial cap in Alternative 1 resulted in an increase of NOx and PM 2.5 emissions by 10,981 tons and 2,773 tons, respectively.

The second 15-day revisions continue to disadvantage cost-effective solutions to reduce ghg emissions. CHS encourages CARB to promote policies that encourage the responsible production and use of renewable feedstocks while addressing concerns about deforestation through targeted risk-based measures. CARB should increase the stringency factor, which would raise credit prices while allowing the market to determine the lowest cost options to achieve ghg emission reductions.

Sustainability requirements

CARB proposed sustainability requirements are unrealistic and unnecessarily complex given existing
 compliance programs. CHS encourages CARB to consider a targeted, risk-based approach that
 prioritizes regulatory efforts in areas with higher risk deforestation potential and waste feedstock
 origination over lower risk regions like the U.S. and Canada. Existing provisions in the U.S Renewable
 Fuel Standard (RFS) and Canada's Clean Fuel Regulation (CFR) are practical and functioning models.

As proposed, it is not realistic for farmers to implement sustainability certification by 2026 due to agricultural supply chain and crop harvest cycles. Alternatively, it is realistic to meet sustainability requirements by permitting a level of aggregate compliance from crop-based feedstocks produced within the sustainability provisions of the RFS, Canadian CFR or energy tax provisions in the Inflation

CHS specifically encourages CARB to not include North American soy, canola and sunflower oil in the credit generation cap since they are already qualified to generate RINs in the RFS by attesting that the feedstocks are grown on land that hasn't been converted since January 1, 2008. In turn, the Canadian CFR exempts U.S. crop-based feedstock given this RFS compliance provision. Recognizing biofuels produced in compliance with existing U.S. programs is a practical and effective way to achieve CARB's goals without sacrificing any sustainability gains.

Fuel pathways

Reduction Act.

As the science on land use change (LUC) continues to evolve, CARB should recognize that there are instances in which LUC should be reduced, as well as the instances where LUC should be increased. CHS encourages CARB to consider repeated requests to update LUC models when science reduces LUC penalties, including soybean oil. CARB's LUC modeling for BBD is nearly a decade old, producing a score of 29.1 gCO2/MJ. Evolving data from models like Argonne GREET's Carbon Calculator for Land-Use and the Land Management Change from Biofuels Production (CCLUB) illustrate lower estimated values of 12.5 and 12.2 gCO2/MJ for soybean oil, respectively.



259.7 CHS encourages CARB to initiate a targeted rulemaking to update the 2014 GTAP dataset and related to LUC values by the end of Q2 2025.

Conclusion

259.8 CHS respectfully suggests CARB convene an expert working group in early 2025 to consider issues related to the cap on credit generation, sustainability provisions, and land use change.

259.9 CARB analysis, existing federal regulations and recent LUC modeling support the ongoing ability for U.S. grown feedstocks and renewable fuels to enable California to achieve decarbonization goals.

259.10 The proposed second 15-day changes, including the vegetable oil cap, would have the unintended consequence of increasing fuel prices and reducing ghg emissions by limiting the credit generation of biodiesel and renewable diesel. Restricting credit generation of domestically produced fuels would consequentially advantage global market participants over U.S. crop-based feedstock and renewable fuels.

Leveraging existing sustainability frameworks in the U.S. and Canada enables CARB to achieve a
 targeted, risk-based sustainability compliance program. This approach supports the evolving biofuel industry and domestic markets for farmers.

Sincerely,

rian Schawell

Brian Schouvieller SVP, Trading and Risk Management CHS Inc.



October 15, 2024

Chair Liane Randolph and Members of the Board California Air Resources Board 1001 I St. Sacramento, CA 95814

RE: Newtrient Comments on the Second 15-Day Changes to the Low Carbon Fuel Standard

Dear Chair Randolph and Members of the Board,

Newtrient appreciates the opportunity to comment on the Second 15-Day Changes to the Low Carbon Fuel Standard (LCFS). Newtrient was founded by leading milk cooperatives and organizations, representing 20,000 dairy farmers producing approximately half of the nation's milk supply.

Newtrient applauds the success that has been achieved by the LCFS program and the two programs directed by the California Department of Food and Agriculture (CDFA) that have been particularly vital to the progress California has made. The Dairy Digester Research and Development Program (DDRDP) and the Alternative Manure Management Program (AMMP) have received 1.86% of the California Climate Investments program as of May 31, 2023, and the GHG reductions from these two programs represent 23.69% of the total for all California Climate Investments program has the largest GHG reductions of any single subprogram (22.1 million MTCO₂e) and represents the single most effective program in the overall strategy to achieve the ambitious climate goals set by the State of California.

Analysis shows that continued implementation and commitment to the incentive-based climate smart solutions that are currently driving voluntary dairy methane reduction in California should, by 2030, achieve the full 40 percent reduction in dairy methane sought by state regulators without the need for direct regulation."²

 ¹ California Climate Investments Program: 2023 CARB Mid-Year Data Update (May 31, 2023), (<u>https://ww2.arb.ca.gov/sites/default/files/auction-proceeds/cci_2023mydu_cumulative_statistics.pdf</u>)
 ² Kebreab, Ermias, Ph.D., Mitloehner, Frank, Ph.D., and Sumner, Daniel A., Ph.D., Meeting the Call: California is Pioneering a Pathway to Significant Dairy Methane Reduction (December 2022), available at:

https://clear.ucdavis.edu/news/new-report-california-pioneering-pathway-significant-dairy-methane-reduction



With our support of CARB and the LCFS and the success of the dairy industries programs that are producing these significant results in mind, Newtrient would like to offer the following comments on the Second 15-Day Changes to the Low Carbon Fuel Standard:

Auto Acceleration Mechanism (AAM)

The second 15-Day changes package is focused on targeted modifications to the proposed regulatory text and Newtrient would like to express our support for the new amendments to the program. Specifically, the modifications made in the second 15-Day changes to the Auto Acceleration Mechanism (AAM). Switching from a calendar year of data to the most recent four quarters of data as the determination for whether the AAM is triggered will allow for greater transparency and market certainty to LCFS participants. Adoption and implementation of this mechanism will ensure that potential emission reductions are not left on the table and will help California reach its climate goals faster if triggered.

Temporary Pathway for Low Carbon Intensity (CI) Electricity Produced from Biomethane

Newtrient would also like to express our approval of the addition of a temporary pathway for low carbon intensity (CI) electricity produced by a fuel cell from biomethane from dairy or swine manure as well as the clarification on the temporary fuel pathway for hydrogen produced from dairy or swine biomethane. Similarly, the 15-day changes propose to allow for book-and-claim accounting of biomethane to produce electricity for electric vehicle charging, but only if the electricity generated is from a fuel cell. Both modifications increase the application of biomethane beyond its traditional uses in other technologies. Recognizing the importance that biomethane has in advancing non-combustion technologies is a critical part of the energy transition and will help California meet its climate goals. Newtrient would suggest that the pathway language could be more inclusive recognizing "non-combustion technologies" in general instead of specifying only "fuel cell technology".

Avoided Emission Crediting

Newtrient did not support the phaseout of avoided methane emission crediting in the 45day package, nor the modified language regarding the requirements for crediting periods in the first 15-day changes. The second 15-Day changes package adjusts these requirements to state that a project certified before the effective date of the regulation is allowed three consecutive 10-year crediting periods, and projects certified after the effective date of regulation or after January 1, 2030, will be limited to two consecutive 10-year crediting periods. As stated previously, Newtrient opposes any changes to the current system.

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260.3



260.3 cont. All the recommended proposals place dairy biomethane projects at a significant disadvantage, could potentially lead to shutdowns, and will certainly stifle investments in new projects going forward. Emission reductions continue to occur for the life of the methane capture project (i.e., the biomethane digester's asset life). Therefore, the crediting period for avoided emissions should mirror the asset life of the capture technology, which is greater than 20 years.

Newtrient strongly believes that the proposed phaseout is inconsistent with the incentivebased approach outlined in SB 1383. Moreover, eliminating or phasing out the avoided methane crediting in the dairy sector would lead to an inability to meet the state's targeted methane reduction goals and result in significant dairy methane emissions leakage. Avoided methane crediting is a key component of dairy methane reduction incentives that has achieved significant reductions to date and is one of the most effective tools to meet California's GHG goals.

According to a UC Davis analysis:

... misguided efforts to change course by forced coercion to pasture-based operations, direct regulation of dairy farms, or limitation on dairy digesters incentives will not only fail to achieve the desired greenhouse gas emissions reductions but will exacerbate the problem by causing significant emissions leakage. Revenue streams that incentivize investment in biogas capture and beneficial use are critical. Phasing out of avoided methane crediting in the dairy sector would jeopardize existing projects, making them uneconomic in the longterm, and dry up investment capital for the additional digester projects sought by CARB to achieve the state's ambitious and aggressive targets.³

The ultra-low carbon indices within the dairy Anaerobic Digestion (AD)/Biogas sector are real and well-vetted within the national laboratory-developed Greenhouse Gases, Regulated Emissions, and Energy Use in Technologies (GREET) model. The low carbon intensity of these projects arises from a combination of well-to-wheels carbon gains plus the methane offsets from baseline methane emissions from manure management, storage, and application. Methane offsets from baseline emissions are a legitimate accounting practice as baseline, pre-AD/biogas systems emissions exist, and are largely removed through the installation of the AD/biogas systems.

Avoided methane emissions are a critical part of science-based, life cycle assessments, and their inclusion in carbon intensity scores are consistent with internationally

³ Kebreab, Ermias, Ph.D., Mitloehner, Frank, Ph.D., and Sumner, Daniel A., Ph.D., Meeting the Call: California is Pioneering a Pathway to Significant Dairy Methane Reduction (December 2022), available at: <u>https://clear.ucdavis.edu/news/new-report-california-pioneering-pathway-significant-dairy-methane-reduction</u>



260.3 cont. recognized standards of carbon accounting. The scientific evidence for this is robust and recognizes that the baseline includes methane emissions that would otherwise be released into the atmosphere. Recognizing methane and its role as a short-lived climate pollutant, while incentivizing its removal from the atmosphere, has proven highly successful in supporting the reduction of millions of metric tons of carbon dioxide equivalents. We strongly encourage CARB to continue its longstanding commitment to a science-driven framework that utilizes proven science including Argonne National Laboratory's GREET model.

Furthermore, Newtrient would like to reiterate that we do not believe the addition of
 deliverability requirements under the program is necessary. We urge CARB to work with
 biomethane stakeholders to come up with a better solution for these issues.

True-Up Provision

260.5 Newtrient is pleased to see the proposed amendments to expand the credit true-up to include periods using temporary pathway CIs after annual verification following stakeholder input highlighting the benefits of the credit true-up. Based on our understanding of the language, reporting that is submitted March 31, 2025, will cover the years 2023-2024 and include a credit true-up back to 2023. However, Newtrient continues take issue with the proposed true-up provisions that adjust credits based on verified operational CIs relative to certified CIs, applying a penalty of four times the spread for shortfalls. The rationale for a 4X spread is unclear as a smaller spread (e.g., 2X) serves as a significant disincentive to producers for being overconfident in their analysis. Newtrient asks CARB to explain their rational for including this provision and to consider a more balanced response that provides flexibility to consider situation-specific factors rather than defaulting to a 4X penalty.

Conclusion

As the technology in the transportation sector continues to evolve and advance towards lower carbon alternatives, Newtrient and other members of the dairy industry are following suit and are ready to serve these new markets, such as alternative jet fuel (AJF), low-CI hydrogen, as well as exploring opportunities where biomethane can be utilized outside of transportation. As these markets continue to grow, Newtrient asks CARB to remain mindful of the success of the historical framework of the existing LCFS program and to continue to apply it to newer pathways and technologies, including the use of avoided emissions and book-and-claim. Additionally, Newtrient recommends that CARB, starting with the 2024 amendments to the LCFS, send a clear policy signal that biomethane is a necessary and effective decarbonization strategy in these other sectors (e.g., residential, commercial, industrial) that are fundamental to the state meeting its ambitious GHG reduction targets.



Over the past year and a half, CARB staff have held numerous public workshops to gather feedback on potential changes to the program, in which Newtrient has participated, and we are pleased to see that the rulemaking is nearing completion.

Thank you for the opportunity to comment on the proposed amendments, and we look forward to engaging with CARB staff on these topics.

Sincerely, ark

Mark Stoermann Chief Operating Officer Newtrient LLC



VESPENE ENERGY 1331 7th Street Suite F Berkeley CA 94705		Dear California Air Resources Board,
	261.1	I am writing on behalf of Vespene Energy, a biogas developer who converts biomethane from dairy digesters into renewable electricity. Our projects provide significant environmental and community benefits by reducing CO ₂ and other pollutants while generating clean, reliable power. As part of our commitment to sustainability, we urge CARB to include linear generators alongside fuel cells in the proposed language on non-combustion technologies.
		Linear generators, like those from Mainspring, meet California's strictest air emissions standards, with data proving their emissions profiles match or exceed those of fuel cells. By only including 'fuel cells,' the current language limits available technology options and slows innovation in non-combustion energy solutions.
		Linear generators are highly effective when paired with renewable natural gas (RNG) to power electric vehicles via book-and-claim mechanisms. Their clean emissions, dispatchability, and full turn-down capability make them ideal for projects like those we develop with California dairies.

A simple fix would be to replace 'fuel cells' with 'fuel cells or linear generators' in the regulation. This change would ensure fairness, foster technological diversity, and support California's goals of reducing carbon emissions and promoting clean energy

Thank you for considering this important update, which will allow us and others in the industry to make the best decisions for California's clean energy future.

Sincerely,

Adro

Adam Wright

CEO

BŪNGE

1391 Timberlake Manor Parkway Chesterfield, MO 63107 314.292.2000 bunge.com

October 16, 2024

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

Re: Second 15-Day Package of Proposed Low Carbon Fuel Standard Amendments

Dear Chair Randolph:

Thank you for the opportunity to comment in response to the second 15-day package of proposed modifications to the 2024 Low Carbon Fuel Standard ("LCFS") amendments that the California Air Resources Board ("CARB") released on October 1, 2024. Our comments provide draft regulatory language that would clarify that winter canola, when it is grown in North America as a second crop or cover crop, should be considered a distinct feedstock from traditional canola for purposes of the proposed oilseed cap and the Table 6 canola value. Part I offers background on the issue and proposed regulatory text. Part II provides more general comments on the second 15-day package.

As a leading oilseed processor, Bunge buys and processes agricultural commodities to turn them into products used in food, animal feed, and renewable diesel. Bunge is also a 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 chains in 2025. Bunge's robust traceability and monitoring systems give us significant insight into our supply chains. We are using technology and data to scale our efforts in geographies where deforestation is a higher risk and working with farmers to incentivize sustainable practices. We have already achieved 100 percent traceability in our direct supply of soy in priority areas in South America. We achieved 97.7 percent traceability in our indirect supply of soy in Brazil's high-risk areas in 2023.

I. Proposed Regulatory Language Related to Winter Canola

A. Background on Winter Canola

In North America, winter canola is canola grown as a second crop—that is, planted in the fall and harvested in the spring between primary crops in a multi-year rotation. Farmers overwhelmingly grow winter canola on land that would otherwise be fallow during that period. As a result, winter canola does not displace other crops or generate additional demand for new October 16, 2024 Page 2

cropland, and it therefore has a demonstrably lower ILUC risk than spring canola.¹ Winter canola also provides soil health and other environmental benefits associated with cover crops. At this time, the market is relatively small for this innovative crop with many environmental benefits and few negative impacts.

262.1 cont. Bunge is concerned that two aspects of the current regulatory text may be susceptible to an interpretation that would discourage the market for winter canola.

First, the proposed oilseed cap might be read to include winter canola. In the first 15-day package, CARB proposed a cap on LCFS crediting for canola oil and soybean oil. In the second 15-day package, CARB added sunflower oil to the cap and included other clarifications.² CARB has stated that the oilseed cap is intended to address the "potential adverse impacts" of these crops.³ However, CARB did not clarify in the second 15-day package that the cap does not apply to winter canola. Because the cropping practices used to grow winter canola result in a low or zero ILUC risk, LCFS crediting for winter canola would not cause the "adverse impacts" CARB is trying to address in production of conventional canola, soybean, or sunflower feedstocks. If the cap is interpreted to include winter canola, that would prevent this innovative market from scaling.

Second, Table 6 could be interpreted to require a higher ILUC value for winter canola than is justified by the scientific research. The current regulatory text does not make clear how winter canola would be treated for purposes of LUC accounting under § 95488.3(d) and Table 6.⁴ Table 6 includes ILUC values for six "region/feedstock/fuel combinations," including "canola biomass-based diesel" from North America.⁵ Although that ILUC value reflects 2015 modeling of conventional North American canola—i.e., canola grown as a primary crop—Table 6 does not specifically say so. As a result, there is risk that Table 6 could be read to mean that same "canola biomass-based diesel" ILUC value applies to North American winter canola, even though its cropping practices justify a lower value.

B. Proposed Regulatory Language

262.1 cont. To address these ambiguities, Bunge encourages CARB to clarify that winter canola will not be considered as conventional canola for purposes of the proposed oilseed cap and for purposes of the Table 6 ILUC values. Failure to include these changes could seriously chill efforts to

¹ See, e.g., Farzad Taheripour & Ehsanreza Sajedinia, Purdue University, Induced Land Use Change: Case of Winter Rapeseed Biodiesel (May 2024) (examining the ILUC of the entire canola market and concluding that using winter canola oil as the feedstock "has a significant effect and decreases the corresponding ILUC emissions to about half of spring [canola] ILUC values").

² CARB, LCFS Second 15-Day Package: Proposed Regulation Order at 36, § 95482(i) (Oct. 1, 2024), https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/2nd_15day_atta-1.pdf. ³ CARB, LCFS Second 15-Day Package Notice at 3 (Oct. 1, 2024),

https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/2nd_15day_notice.pdf. ⁴ Second 15-Day Package: Proposed Regulation Order at 124–25, § 95488.3(d), Table 6.

⁵ Id.

262.1 cont. develop winter canola in the United States. Accordingly, we recommend adopting the following proposed regulatory language.

First, we recommend adding a new definition to "Definitions and Acronyms" in § 95481(a):

"Primary-Crop Canola" means canola that is the crop produced during that geographical area's main growing season. Primary-crop canola does not include canola that is grown as a second crop or as a cover crop. A second crop or cover crop would not displace a main crop and would not be detrimental to soil quality.

Both "second crop" and "cover crop" in the above proposed definition are defined by Department of Agriculture regulations.⁶

Second, we recommend including "primary-crop" before "canola oil" in Section 95482(i) to clarify that the oilseed cap applies to conventional canola:

Biomass-based diesel produced from soybean oil, <u>primary-crop</u> canola oil, and sunflower oil is eligible for LCFS credits for up to twenty percent combined of total biomass-based diesel annual production reporting, by company, based on the following transaction types: production in California, produced for import, and import. Any reported quantities of biomass-based diesel produced from soybean oil, <u>primary-crop</u> canola oil, and sunflower oil in excess of twenty percent on a companywide basis will be assigned a carbon intensity equivalent to the carbon intensity benchmark shown in Table 2 in Section 95484(e) for the applicable data reporting year, or the certified carbon intensity for the associated fuel pathway – whichever is greater. For companies which have submitted a biomass-based diesel pathway certification application under CA-GREET3.0 or which have a certified biomass-based diesel pathway prior to the effective date of this regulation, this provision takes effect beginning January 1, 2028.

Third, we recommend making clear that the canola LUC value in Table 6 applies only to conventional canola by revising "Canola Biomass-Based Diesel" to read "<u>Primary-Crop</u> Canola Biomass-Based Diesel."

Fourth, we recommend inclusion of the phrase "<u>cropping practices</u>" throughout § 95488.3(d) to confirm (1) that the pathways in Table 6 may be specific to certain "cropping practices," and (2) that CARB has authority to designate a distinct pathway and LUC value depending, in part, on cropping practices.

⁶ See 7 C.F.R. § 457.8 ("Second crop. With respect to a single crop year, the next occurrence of planting any agricultural commodity for harvest following a first insured crop on the same acreage. The second crop may be the same or a different agricultural commodity as the first insured crop, except the term does not include a replanted crop. If following a first insured crop, a cover crop that is planted on the same acreage and harvested for grain or seed is considered a second crop . . ."); *id.* ("Cover crop. A crop generally recognized by agricultural experts as agronomically sound for the area for erosion control or other purposes related to conservation or soil improvement, unless otherwise specified in the Special Provisions. A cover crop may be considered a second crop (see definition of 'second crop')").

262.1 cont. (d) Accounting for Land Use Change.

(1) The Executive Officer calculated LUC effects for certain region-specific cropbased biofuels using the GTAP model (modified to include agricultural data and termed GTAP-BIO) and the AEZ-EF model. LUC values for six region/feedstock/cropping practices/fuel combinations are provided in Table 6 below. The Executive Officer may require a fuel pathway applicant to use one of the values in Table 6, if the Executive Officer deems that value appropriate to use for a region/feedstock/cropping practices/fuel combination not currently listed in Table 6, based on empirical LUC, crop yields, cropping practices, and emissions factors.

(2) The Executive Officer may determine that no value in Table 6 is conservatively representative of a particular region/feedstock/cropping practices/fuel combination and assign a more conservative LUC value. Such determination must be based on the best available empirical data, including but not limited to satellite-based remote sensing data for land cover monitoring, crop yields, cropping practices, and emission factors from the AEZ-EF model or carbon stock datasets. For regions/feedstocks/cropping practices/fuel combinations⁷ not listed in Table 6, the Executive Officer may determine and assign an appropriate LUC value based on empirical land cover data, yields, cropping practices, and emission factors.

In comments on the first 15-day package, Bunge shared its concerns about how the proposed regulatory changes could affect the viability of winter canola-based fuels. Both the oilseed cap and Table 6 LUC values are intended to address land-conversion concerns that are likely inapplicable to winter canola. The narrow edits proposed above reinforce that allowing differential treatment for winter canola in light of its unique cropping practices is fully compatible with CARB's goals in this regulatory process. Even as the proposed changes ensure that winter canola may secure an appropriate, science-based ILUC score, they do not tie CARB's hands or *require* the agency to provide winter canola with a lower ILUC score. This language would simply ensure that the agency maintains discretion to make a science-based determination in light of all potentially relevant factors.

While Bunge believes that the regulatory language proposed above is a promising solution, Bunge is also open to other avenues to clarify that winter canola would not be subject to the oilseed cap and that a pathway with a carbon intensity value lower than that in Table 6 could be certified. We welcome further engagement with CARB on alternative possible solutions.

II. General 15-Day Package Comments

Bunge has long supported the LCFS, which has increased volumes of low-carbon fuels including the biofuels for which Bunge supplies feedstocks—to cause California's petroleum fuel

⁷ The inclusion of "regions" and "fuel combinations" here addresses an apparent drafting omission in the existing regulation.

October 16, 2024 Page 5

use to fall by 1.3 billion gallons since 2019. We are pleased to have contributed in a small way to the 12.63% decline in the carbon intensity of the state's transportation fuels since 2010.

- However, Bunge is disappointed that the proposed cap on vegetable oils remained in CARB's second 15-day package, and that the sustainability certifications and associated timelines remained largely unchanged. Historically, the LCFS has carefully set CI scores for fuels based on science, which has been a hallmark of its success. This new proposed policy of adopting arbitrary limits on certain feedstocks threatens to undermine that science-based approach. Bunge also notes that CARB first proposed the sustainability certifications to address LUC concerns *in lieu of a cap*. Now, CARB proposes both, even though they are duplicative. Further, we maintain the concerns that we have previously raised with respect to the proposed sustainability certifications, which do not account for the fact the land-conversion risk is almost non-existent in North America. We encourage CARB to re-examine its proposed certifications to ensure the approach it is taking is commensurate with the risks specific to each region of the world.
- While Bunge disagrees with the cap, Bunge appreciates that CARB has amended the proposal to give parties more time to prepare by proposing that the cap take effect January 1, 2028 for companies that have submitted biomass-based diesel pathway certification applications or have certified biomass-based diesel pathways prior to the effective date of the regulation.⁸ Bunge encourages CARB to take a similar approach with the sustainability certifications by moving back implementation of requirements related to farm boundary data and attestations so that these would apply for the 2028 data year, rather than the 2026 data year as currently proposed.⁹ As Bunge expressed in its comments on the first 15-day package, our experience implementing both voluntary and European Union sustainability measures informs our view that beginning compliance in 2028 is a more realistic timeline.

III. Conclusion

In conclusion, Bunge encourages CARB to clarify that the proposed oilseed cap and Table 6 canola ILUC value will not adversely impact winter canola, which has significant promise for further reducing the carbon intensity of California's liquid fuels without causing significant adverse impacts to land use. The draft regulatory language provided here offers one path to make this important clarification.

Bunge appreciates CARB's commitment to improving the LCFS in the 2024 amendments. We hope our comments on the second 15-day package help enhance the program in its final version.

Sincerely,

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⁸ Second 15-Day Package: Proposed Regulation order at 36, § 95482(i).

⁹ *Id*. at 169–70, § 95488.9(g)(B).

October 16, 2024 Page 6

Robert Coviello Chief Sustainability Officer and Government Affairs



To: California Air Resources Board

Thank you for the opportunity to again provide comments on the Board's LCFS rulemaking process. Allotrope Partners LLC, has been working for over a decade on developing sustainable demand for forest biomass waste streams in order to create long-term economic drivers for increased forest health management in California. This work closely aligns with the CARB 2022 Scoping Plan for Achieving Carbon Neutrality, specifically its goal to "accelerate the pace and scale of climate smart forest management to at least 2.3 million acres annually."¹

Through our subsidiary, Allotrope Cellulosic Development Company (ACDC), we have been actively developing a cellulosic ethanol plant in Anderson, CA. The plant will utilize 330,000 bone dry-tons of biomass per year and produce 22 million gallons of low-carbon ethanol, which will ultimately be used for the production of sustainable aviation fuel (SAF), as well as approximately 500,000 MMBTUs of renewable natural gas per year. The plant will contribute to carbon neutrality while improving forest management by expanding waste biomass processing infrastructure, a strategy specifically cited in the CARB Scoping Plan,² and also improving air quality by mitigating the risk of wildfires and reducing open pile burning of forest and agricultural biomass.

ACDC presently has key technology, offtake and strategic partners in place, including Axens North America, bp, and Sumitomo Corporation of the Americas, respectively. ACDC and its partners have invested significant time and resources into the development of this project, which will be one of the largest economic opportunities benefiting Shasta County in many decades. The project will qualify for federal tax credits through the Inflation Reduction Act and is in the second stage of the USDA's 9003 loan guarantee process.

Forest Biomass Waste and Specified Source Feedstocks

ACDC is concerned about what appears to be contradictions between the definition of "Forest Biomass Waste" in section 95481(a) and the definition of "Specified source feedstock" in section 95488.8(g)(1)(A)(3). The definition of Forest Biomass Waste is:

> ""Forest Biomass Waste" means small-diameter, non-merchantable residues, limited to forest understory vegetation, ladder fuels, limbs, branches, and logs that

¹ CARB 2022 Scoping Plan Update, December 2022, at page 252.

² Id at page 252

263.1 cont. do not meet regional minimum marketable standards for processing into wood products."

Meanwhile the specified source feedstock definition is:

"3. Forest biomass waste from non-industrial forestland removed for the purpose of wildfire fuel reduction, to reduce the risk to public safety or infrastructure, to create defensible space, or for forest restoration; and from a treatment in which no clear cutting occurred and that was performed in compliance with all local, State, and federal rules and permits."

This definition of a specified source feedstock as a subset of forest biomass waste creates challenges. For instance, Forest Biomass Waste, as defined, is only non-merchantable material,³ but, as described in our earlier letter, material generated from wildfire fuel reduction activities in California often includes a percentage of merchantable material. In situations where, for instance, a smaller private land owner is removing material, only a portion of the material is merchantable and it can be too costly to treat the merchantable material separately and more efficient to treat all the material as Forest Biomass Waste. That cost/benefit decision is best made on a case-by-case, site-specific basis by those doing the work. By defining forestry related specified source feedstock as only non-merchantable material, certain, quite common fire mitigation activities — ones that produce some amount of merchantable material but not enough to make it cost effective to extract — will be precluded, thus discouraging rather than promoting more fire mitigation activities.

In addition, excluding "treatment[s] in which no clear cutting occurred" — another term that is not defined in the LCFS Regulation and is thus ambiguous — creates challenges. Fire breaks are essential parts of many proven fire mitigation programs, but fire breaks may well be considered clear cuts. This would further hinder additional fire mitigation activities from qualifying.

Furthermore, as discussed in our earlier letter, the term "non-industrial forestland" is ambiguous. It is not defined in the LCFS Regulation, nor does Section 95488.8(g)(1)(A)(3) reference a definition in any other regulation. While we strongly support the apparent intention to promote material from smaller landowners, we fear that

³ Note also that the term "regional minimal marketable standards" is vague and could lead to controversies as there are no third party standards that define merchantable timber material.

263.1 the inconsistencies in this definition will make it difficult for smaller landowners to take advantage of the specified source feedstock channel. We therefore respectfully request that in the Final Statement of Reasons (the FSOR) for this rulemaking the Board clarify the meaning of the term "non-merchantable" as it is used in Section 95481(a) as well as the meaning of the terms "non-industrial forestland" and "clear cutting" as they are used in section 95488.8(g)(1)(A)(3).

Sustainability Requirements For Forest Biomass

263.2 We support the addition of 95488.9(g)(1)(B), which ensures that biomass sourced from forest land that meets CARB's Compliance Offset Protocol for U.S. Forest Projects General Eligibility Requirements also will meet LCFS eligibility requirements. We are concerned that while most larger forest operators in California will qualify, there may be non-conformances such as requirements around salvage harvesting that could create challenges. We are hopeful that such issues can be addressed as part of the pathway development process, but respectfully request that the Board clarify the intent of this language in the FSOR for this rulemaking.

We believe that meeting those eligibility requirements or another "continuous third-party sustainability certification" will be a viable option for many large forest landowners that have the resources to meet such standards. But we are concerned that this approach will be difficult for smaller landowners that do not have the resources to maintain such certifications. Combined with our concerns regarding the forest biomass definition of Specified Source Feedstocks listed above, we fear that biomass from smaller forest landowners may be difficult to utilize in a manner that assures that it can qualify for LCFS credits.

A significant portion of the forest land in the "Wilderness Urban Interface" (WUI) in California is held by smaller forest landowners or as housing lots that desperately need regular treatments to ensure fire risk is minimized. We believe that, as the rules stand, it will be exceedingly difficult for the use of such material to qualify for LCFS credits.

We believe the best solution to this challenge is, as we suggested previously, that the definition of Forest Biomass Waste be amended as follows:

263.2 cont. "Forest Biomass Waste" means <u>residues that are 1) removed for wildfire mitigation</u>, <u>forest restoration projects, or the protection of public safety, or 2)</u> small-diameter, nonmerchantable residues, limited to forest understory vegetation, ladder fuels, limbs, branches, and logs that do not meet regional minimum marketable standards for processing into wood products.

Note that if the definition of Forest Biomass Waste were amended in this manner, this would expand the amount of forests biomass that could qualify as Specified Source Feedstock. If the Board instead chooses to leave the definition of Forest Biomass Waste as is, then removing the word "waste" from the Specified Source Feedstock definition would expand the definition of Specified Source Feedstock in a manner that could provide flexibility that would enable all fire mitigation work to qualify. As such, we respectfully request that the Specified Source Feedstock definition for forest biomass should be amended as follows:

"3. Forest biomass waste-from non-industrial forestland removed for the purpose of wildfire fuel reduction, to reduce the risk to public safety or infrastructure, to create defensible space, or for forest restoration; and from a treatment in which no clear cutting occurred and that was performed in compliance with all local, State, and federal rules and permits."

Thank you for the opportunity to contribute to this rulemaking process. Our goals are strongly aligned with the State's vision for scaled-up forest management as a key solution to California's wildfire crisis as well as combating climate change. We respectfully request the LCFS program rules be amended to support sustainable forest management that helps avoid megafires and associated climate and health impacts.

Sincerely,

24 HAA

Robert Hambrecht Partner Allotrope Partners LLC, and its subsidiary, Allotrope Cellulosic Development Company LLC



October 16, 2024

264.1

264.2

Honorable Chair Liane Randolph and Honorable Board Members California Air Resources Board 1001 | Street P.O. Box 2815 Sacramento, CA 95812

> Re: Proposed Second 15-day Change Amendments to the Low Carbon Fuel Standard Regulation

Submitted to https://ww2.arb.ca.gov/applications/public-comments

Dear Chair Randolph and Honorable Board Members:

CalETC appreciates this opportunity to SUPPORT the Low Carbon Fuel Standard (LCFS) regulation and provide feedback for CARB Board member consideration. As discussed in detail below, CalETC supports the proposed draft regulation order ("draft order") dated August 12, 2024, version ("15-day changes") with the additional October 1, 2024, modifications (second 15-day changes). We appreciate the many changes proposed in the October 1 version that respond to our two prior letters and our two joint letters with the EV Charging Association.

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, Northern California Power Agency, 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. Additionally, CalETC believes that LCFS provides benefits for consumers and is an important tool in the transition to a decarbonized economy (see attached factsheet for details). This letter is submitted on behalf of the CalETC board of directors.

CalETC supports a number of changes that were made in the second 15-day changes that address our concerns from the February 20 and August 27, 2024, comment letters. As described in more detail in CalETC's previous comment letters dated February 20, 2024, and August 27, 2024, CalETC supports the following changes to subsection 95483(c)(1)(A),which are critical to the ongoing successful implementation of programs by all utilities:

1015 K STREET, SUITE 200 SACRAMENTO, CA 95814 P [916] 551-1943 F [916] 441-3549

- Specifying that base credit proceeds previously allocated to the Clean Fuel Reward program by Electrical Distribution Utilities (EDUs) that remain unspent will be returned to those EDUs if base credits are allocated to the original equipment manufacturers (OEMs). CalETC supports this proposed amendment because these banked credits will significantly expand the utilities' holdback programs, including programs to support medium- and heavy-duty EV adoption, which will be especially needed if CARB does not create the statewide medium- and heavy-duty Clean Fuel Reward program.
- Addition of "panel and service upgrades" to the equity holdback project list.
- Addition of coordination with "a community-based organization, or a California Community College" to the re-skilling and workforce development projects to the equity holdback project list.
- Addition of a ten percent administrative cost cap to the utility holdback programs instead of five percent.
- Changing the holdback equity requirement from "proceeds" to "spending" and further specifying that if an EDU does not spend the required percentage on equity projects in a calendar year, the shortfall of spending will roll over to their total equity spending requirement for the following year.
- Clarifying that non-large or medium-sized investor-owned EDUs are required to spend 50 percent of holdback credit proceeds on equity projects, as opposed to75 percent for large-or medium-sized investor-owned EDUs.
- Clarifying that equity holdback projects approved by the Executive Officer pursuant to subsection 95483(c)(1)(A)(5)a. ix. comply with the LCFS regulation.
- Specifying that any unspent proceeds from non-opt-in EDU base credits that were allocated to the Large EDUs beginning with the deposit of Q2 2019 credits through the deposit of Q2 2024 credits and then transferred to the Clean Fuel Reward program may be transferred by the Clean Fuel Reward Program Administrator to small EDUs that opted in to the LCFS program by March 31,2025. Base credit proceeds allocated in this manner are subject to the same spending requirements included for other utilities under sections 95491(e)(5) and 95483(c)(1)(A).

264.3 Similarly, CalETC supports staff's proposed changes in section 95481(a) to the following definitions. Please refer to our previous letters for further explanation.

- "Clean Fuel Reward,"
- "Commercial Vehicle,"
- "Electrical Distribution Utility," and
- "Shared HD-FCI Charging Site."
- For all of the reasons staff provided in the second 15-day change notice, CalETC supports staff's proposed changes in subsection 95484(b) ensuring that the determination for whether the Automatic Acceleration Mechanism is triggered will be based on data from the most recent four quarters of reporting.

- 264.5 In our February 20 and August 27, 2024, comment letters, CalETC expressed concern with some implementation issues which we believe are important to improve clarity and operations for the utility holdback programs and medium-and heavy-duty Statewide Clean Fuel Reward (CFR) program. We understand from CARB staff that these remaining items can be resolved through language in the Final Statement of Reasons and future guidance documents. We look forward to ongoing collaboration with staff following adoption of the regulation.
- 264.6 As noted in our February 20 and August 27, 2024 comment letters, CalETC strongly supports the Low Carbon Fuel Standard as it has been tremendously successful in supporting the transition from petroleum to cleaner transportation fuels including electric fuel. As described in more detail in the attached fact sheet, the LCFS has also supported utility charging and infrastructure programs that directly benefit California's electric utility customers. 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,

Laura Renger Executive Director

cc: Rajinder Sahota Matthew Botill Jordan Ramalingam

CaleETC POWERING THE ELECTRIC VEHICLE TRANSITION

The Low Carbon Fuel Standard (LCFS) supports utility EV and charging infrastructure programs.

California must utilize every tool available to achieve its climate and electric vehicle (EV) goals. Utilities strongly support the LCFS because it:



Supports zero-emission vehicle and infrastructure adoption.



Leads to downward pressure on electric utility rates.



Enables Californians to switch to electricity for their transportation fuel, which helps them spend less on energy bills overall.

Adopting a strong LCFS will ensure the equitable adoption of EVs for all Californians. Utilities and CalETC members support CARB's proposed LCFS amendments that:

- Cut harmful diesel pollution by updating the rebate program so that money goes to new and used electric medium and heavy-duty vehicles.
- Support disadvantaged communities by increasing the amount of LCFS proceeds going to equity customers and communities from 37% to 80%.

730,000+ The number of EV rebates that

utilities provided through the LCFS.

BENEFITING UTILITY CUSTOMERS DIRECTLY

The LCFS reduces total energy costs for customers by funding utility transportation electrification programs and services not typically included in the ratemaking processes. Critical transportation electrification programs the LCFS has helped utilities launch and sustain include:

- California Clean Fuel Reward program
- Pre-owned EV rebate programs
- Incentives for residential chargers
 including multi-family
- Rebates for electric drayage trucks
- Incentives for commercial, city and non-profit chargers

Over the past 10 years, the LCFS has been a catalyst for billions of dollars of investments in EVs and infrastructure and will continue to attract private capital to the state. In addition, the LCFS has the added benefit of not relying on funding from the California state budget.

INVESTING IN CLEAN AIR AND EQUITY COMMUNITIES

By helping utilities get more EVs and infrastructure into communities the LCFS is cutting harmful air pollution in lowincome customers and customers in disadvantaged communities.

Without this funding, utility EV programs are not likely to exist at the same scale and many low- and middle-income customers would be left behind. In the future, utilities will continue to utilize LCFS for similar programs and some utilities plan to use LCFS for critical grid upgrades to support the state's growing EV fleet.





Of the credits utilities have earned from the LCFS **go back to programs incentivizing EV adoption**. Zero credits go toward their bottom line or any other purpose.

SAVING CUSTOMERS MONEY ON ELECTRICITY

By helping get more EVs on the grid, the LCFS applies downward pressure on electricity rates, benefiting all electricity customers, not just EV drivers.

With more EVs on the road, more money is available to invest in building a more efficient, affordable, clean energy grid for customers that use all types of technologies from data centers to highefficiency space heating to EV chargers. (<u>Synapse/NRDC</u>).



Surprisingly, adding more EVs to the grid has an even greater impact than non-targeted electric bill credits in reducing rates, especially within equity communities.

REDUCING THE IMPACT OF GAS PRICES

CalETC believes that the LCFS's impact on gasoline prices is overstated and that market pressures from EV adoption will help lower prices at the pump.

As shown in the graph below, there has been no direct, quantifiable link between quarterly LCFS prices and the price of gasoline. There does not appear to be a direct relationship between LCFS credit prices and gasoline prices. Other global macroeconomic factors play a much larger role in influencing gasoline prices.

Research shows that oil prices will be lower in the future if low-carbon transportation technologies are mass deployed, as these technologies will drive a significant reduction in global demand for oil (<u>International Council on</u> <u>Clean Transportation</u>).



Historical LCFS Credit and Retail Fuel Prices Show No Evidence of a Direct Relationship

FUNDING FUTURE CLEAN TRANSPORTATION PROJECTS

If CARB's proposed LCFS changes are adopted, over the next two decades utilities expect to fund billions of dollars in new programs that will advance clean transportation and charging access including:

- Rebates for electric medium and heavy-duty vehicles for small fleets
- Rebates for low-income buyers of new or used EVs
- Incentives for residential chargers for low-income individuals including multifamily
- Subsidized public EV charging for low-income EV drivers

- Finance programs for electric buses and trucks and infrastructure
- City and county-owned EV chargers
- EV education programs
- Training the EV workforce
- Managed charging programs
- Grid upgrades to support EVs

ELECTRIC

VEHICLE

Support for the LCFS

The CalETC members below submitted a letter to Governor Newsom on March 12, 2024, calling for him to support the LCFS.




October 16, 2024

Clerk's Office California Air Resources Board 1001 | Street Sacramento, CA 95812

Submitted electronically via: https://ww2.arb.ca.gov/applications/public-comments

Re: Northern California Power Agency's Comments on 15-Day Changes to the Low Carbon Fuel Standard Regulation

The Northern California Power Agency¹ ("NCPA") respectfully submits these comments to the California Air Resources Board ("CARB") regarding the Second 15-day Changes to the Low Carbon Fuel Standard ("LCFS") regulation as posted on October 1, 2024.

265.1 NCPA SUPPORTS the proposed changes to the LCFS program and encourages the Board to adopt the amended LCFS program. The LCFS is vital for the continued deployment of publicly owned utility (POU) transportation electrification programs, and NCPA and its Members urge CARB to continue this important program.

The comments below detail NCPA's support for several changes made in the second 15-day package. In addition, NCPA requests that specific clarifications be incorporated into CARB's Final Statement of Reasons (FSOR) and future guidance documents to help avoid confusion during the implementation of the proposed amendments to the LCFS.

I. THIRD-PARTY VERIFICATION OF ELECTRICITY CREDITS

A. Delay of Third-Party Verification Requirements for Electricity

265.2 NCPA supports the delay of the third-party verification requirements for electricity credit generators to 2027. However, applying third-party verification requirements to electricity credit generators that generate a very low credit number, under 1,000 annually, will likely cause these entities to drop out of the LCFS program because their credit proceeds will not cover the

¹ NCPA was established in 1968 to construct and operate renewable and low-emitting generating facilities and assist in meeting the wholesale energy needs of its 16 members: the Cities of Alameda, Biggs, Gridley, Healdsburg, Lodi, Lompoc, Palo Alto, Redding, Roseville, Santa Clara, Shasta Lake, and Ukiah, Plumas-Sierra Rural Electric Cooperative, Port of Oakland, San Francisco Bay Area Rapid Transit District, and Truckee Donner Public Utility District – collectively serving nearly 700,000 electric consumers in Central and Northern California.

October 16, 2024 Page 2

verification costs. Many POUs with owned EV chargers will be forced to stop generating nonresidential credits and instead rely on base credits alone, thereby having to scale back their transportation electrification programs. While it is helpful that the LCFS allows for a two-year delay of the verification requirements for credit generators under 6,000 credits, entities such as small cities and non-profits may still need to stop generating non-residential credits in 2029 due to the increased costs. CARB should consider whether they can further delay the requirements for small credit generators and should monitor the impact of third-party verification on small credit generators.

B. Reduce Need for On-Site Visits

265.3 NCPA supports the clarification in the second 15-day package that the regulation does not require on-site visits to individual EV chargers. However, even visits to the central record location may be unnecessary, as reporting for EV chargers is done electronically and can be verified through an online meeting with third-party verifiers. Unnecessary site visits will add costs to contracts for third-party verifiers, taking credit proceeds away from local communities and funneling them to consultants instead. CARB should clarify that desktop verification qualifies as an "on-site visit" whenever possible, and monitor verification reports to ensure that more onerous on-site visits are not required unless warranted.

II. ASSIGNMENT OF BASE CREDITS TO ORIGINAL EQUIPMENT MANUFACTURERS

A. EDU Holdback Allocations Must Be Protected

- 265.4 NCPA supports CARB's clarification that if base credits are allocated to the original equipment manufacturers (OEMs), base credit proceeds previously allocated to the Clean Fuel Reward (CFR) program that remain unspent will be returned to the Electric Distribution Utilities (EDUs).
- 265.5 However, the Second 15-Day Changes did not clarify how the Executive Officer will redirect future base credits from the EDUs to the OEMs, if such an allocation is triggered. Small POU transportation electrification programs depend on LCFS base credits; a loss of credits would severely impact and limit future program offerings. The current language only specifies an allocation of "up to 45% of base credits" – if 45% of base credits are re-allocated evenly from each EDU, small POUs will lose nearly half of all their base credits.

The FSOR should clearly state that the provision's intent is for the OEM allocation not to impact the number of holdback credits issued to each EDU, and the Executive Officer should ensure that the holdback credit allocations for individual EDUs are not negatively impacted. October 16, 2024 Page 3

265.6 B. Clean Fuel Reward Program Timing Is Unclear

The Executive Officer should coordinate with the EDUs on the timing of the OEM allocation decision so that the utilities have appropriate time and information to determine whether to implement the revised CFR program.

If the amendments to the LCFS program are adopted on November 8, 2024, it is unclear whether the EDUs should move forward with planning a modified medium- and heavy-duty Clean Fuel Reward program or if they should await a decision by the Executive Officer. With limited LCFS funds and staff resources available, it would be unfortunate for the EDUs to spend months planning a new program that won't actually be launched. This uncertainty would also negatively impact medium- and heavy-duty fleet owners, who won't know if or when funding will become available.

III. UTILITY HOLDBACK PROGRAMS

A. <u>The Equity Requirement for POUs</u>

- 265.7 NCPA supports CARB's correction of the equity requirements in section 95483 (c) to align with the stated Appendix E: Purpose and Rationale for Low Carbon Fuel Standards Amendments. The corrected equity requirements for POUs will help ensure that POUs can design and implement effective transportation electrification programs for low-income and/or disadvantaged communities.
 - B. <u>Potential Barriers to Accessing Base Credits</u>
- 265.8 CARB did not clarify or remove the requirement in section 95483 (c) for EDUs to specifically provide rate options, despite the requirement being inappropriate and potentially delaying or stopping transportation electrification programs in areas with low EV adoption. CARB should provide clarification in the FSOR that the language in 95483 (c) is meant to encourage a variety of methods for encouraging off-peak charging, as needed by individual utility areas, and does not explicitly require the adoption of a formal rate.
 - C. <u>Caps for Administrative Costs for Equity Programs</u>
- 265.9 NCPA supports the proposed change in the Second 15-Day Changes to return the administrative cost cap for equity programs to 10%, which is more consistent with the needs for administering equity programs.
 - D. Additional Resources for Transportation Electrification in Small POU Territories
- 265.10 NCPA supports the additional language in section 95483 (c)(1)(A)(6) to clarify the process for redistributing unallocated base credits to small POUs that have joined the LCFS program by

October 16, 2024 Page 4

March 31, 2025. These accumulated credit proceeds will help provide additional funding for the state's smallest utilities to design and launch transportation electrification programs.

- E. <u>Clarification to Holdback Program List</u>
- 265.11 NCPA supports CARB's clarifications to the equity holdback program list, such as including "panel and service upgrades" and broadening the list of organizations with which utilities can coordinate workforce development projects.
- 265.12 However, CARB staff should clarify in the FSOR and future guidance documents that any project for electric medium- and heavy-duty (eMHD) infrastructure qualifies as an "equity" project without consideration of the location for the charger. eMHD vehicles provide many benefits to equity communities, whether or not the charging depot happens to be located within an equity community. An overly restrictive interpretation of the requirements for eMHD projects would severely hamper the ability of EDUs to support eMHD projects with LCFS funds.

IV. CONCLUSION

265.13 We appreciate the Board's consideration of these comments, and urge the Board to adopt the proposed amendments to the LCFS program. NCPA looks forward to continuing our collaboration with CARB and other stakeholders to implement the LCFS amendments and ensure the success of the LCFS program.

Respectfully submitted,

Emily hemi

Emily Lemei Customer Programs Manager Northern California Power Agency 651 Commerce Drive Roseville, CA 95678 emily.lemei@ncpa.com



October 16, 2024

The Honorable Liane Randolph Chair, California Air Resources Board 1001 I St, Sacramento, CA 95814 Sacramento, California 95814

RE: Second 15-Day Package for the Low Carbon Fuel Standard Update

Dear Chair Randolph and Members of the Board:

266.1 Clean Energy supports the adoption of the proposed update to the Low Carbon Fuel Standard (LCFS) and would like to express our appreciation for a thorough public process. CARB remains committed to a fuel neutral approach using the best scientific data to measure greenhouse gas emissions performance to ensure the cleanest fuels are used in our state.

While we do broadly support the LCFS update, there are a few constructive improvements that we believe will maximize carbon reductions, improve LCFS credit prices, and foster expanded low carbon investments:

1. Carbon Intensity (CI) Benchmarks:

266.2 The proposed CI benchmarks of 22.75% in 2025 and 30% in 2030 are not aggressive enough to support a 2045 carbon neutrality target, let alone a near-zero/zero emissions future. The LCFS is a nation-leading transportation decarbonization policy last updated in 2018, so the time to be bold and have sufficient ambition with the program is now, not in another 5-6 years.

As of Thursday, October 9th, LCFS credit prices were \$69 from a \$42 low earlier this year. The market really needs to possess a credit price at or above \$120 a credit to support project investment and meet program targets. This is especially the case for dairy digester projects to be built in years 2025-2029, which as proposed, only receive two crediting periods for avoided methane crediting. Low LCFS prices already impact project returns, putting project development on-hold (this has already occurred) and prevents existing projects from operating profitably.

PROPOSED AMENDMENT: CARB staff should recommend a more ambitious benchmark for 2030 that signals a minimum 35% target or a maximum 40% target to the Board. Not only will setting a more ambitious mid-term target send a necessary market signal to investors, it's also critical to curb global warming and support the program's overall viability.

2. Avoided Methane Credit (AMC):

266.3 We appreciate CARB proposing to provide three (3) AMC crediting periods to legacy projects ("grandfathered") certified prior to the adoption of the new regulation. This protects project investments made previously under the program that have seen project returns rapidly deteriorate under the current LCFS market environment, but we must also recognize that new projects need extended AMC length if they are going to be successful.

PROPOSED AMENDMENT: The AMC should not be limited to two consecutive 10-year crediting periods for new projects built between 2025-2029. This action may inadvertently stunt new dairy project investments that California needs to meet its SB 1383 goals. Most dairy projects require long-term agreements with farmers and front-end manure management programs/infrastructure projects to be built at the dairy. AMC crediting is essential to all of this, so reducing the crediting opportunity by one (1) period (10 years) changes the investment criteria, especially at smaller dairies. Unmitigated dairy emissions are one of the largest sources of methane emissions in the state, so removing the AMC tool used to combat these emissions may materially impact the market, especially amongst the smaller dairy facilities. Reducing AMC crediting periods is counterproductive to our climate goals, and therefore, we urge CARB to retain the three (3) crediting periods for projects pre- and post-certification of the regulation.

3. Four-To-One CI Penalty:

266.4 Dairy projects are biological in nature and are impacted by many factors, including but not limited to, ambient temperature, energy input increases and/or decreases, cloud cover, manure quality, herd count, etc., which ultimately can adjust a project's CI. When these types of natural changes occur, the operator of an anaerobic digester will manage the fluctuating project CI and subsequent change in credits being generated. In the event the CI changes unfavorably (moves towards 0, i.e., from -250 to -200) resulting in an over-generation of credits, the appropriate step is to "bank or inventory" these credits in your LCFS LRT account for retirement through the Annual Fuel Pathway Reporting (AFPR) process. This is the normal course of operation and best practice in the industry.

Unfortunately, the proposed regulation would apply a four-to-one penalty to the project if the "operational CI" moves unfavorably compared to the credit generating CI. The four-to-one penalty concept is taken from Cap-and-Trade regulation which levies the penalty against an obligated party that falls outside its threshold, but a low CI project in the LCFS, like a dairy farm, is not an obligated party. To our knowledge, there is no precedent to use a Cap-and-Trade like penalty in the LCFS and doing so would have a material impact on the market.

As an example, and for illustrative purposes only, a 182,500 MMBtu per year (1.46M GGE) dairy project with a CI of -250 would generate approximately 57,232 credits per year. Assuming the project had operational changes resulting in an AFPR CI of -200, the effective credits would be 48,527. But because the LCFS only allows you to change your CI in the LRT system once per year, the project over-generated 8,705 credits. Under the proposed four-to-one penalty, the project would retire the 8,705 credits in the LRT system and then pay a penalty to the state which would be equivalent 8,705 credits x 4 x an assumed LCFS credit price. At a \$60 LCFS the cost is

266.4 cont. \$2.08M and at a \$120 LCFS the cost is \$4.17M. This undoubtedly creates massive exposure and risk to the project with no real net environmental benefit to the state.

Because the four-to-one penalty is so severe, the only opportunity to mitigate it would be to leverage the Margin of Safety ("MOS") mechanism in the regulation which allows you to apply an additional CI adder to your official CI score. A project may have a certified CI score of -250, but the owner of the facility may elect to apply a 50 CI MOS yielding an effective credit generation score of -200. Again, this provides no net environmental benefit to the state of project, but ensures the project is not left with an egregious penalty by generating at a low CI than the AFPR CI. The material downside of being conservative through a MOS is that any "true-up" credits due back to the project, i.e. the MOS CI is -200 but the AFPR CI is -225, means you will not get those credits back for nearly two years. This results in long-term revenue deferral and LCFS price spread risk at the project.

PROPOSED AMENDMENT: CARB should eliminate the Four-to-One penalty as it provides no environmental benefit to the state and only encumbers a project with more financial risk and liability. If the proposed penalty stays, projects will be ultra conservative with their CI and forced to wait nearly two years to get their "true-up" credits after going through the AFPR and verification process. The state will not realize the actual emissions reductions occurring at the projects as they occur.

4. Automatic Adjustment Mechanism (AAM):

- **SUPPORT:** We support the proposed change to the AAM trigger to using data from the most recent four quarters of reporting.
- 266.6 PROPOSED AMENDMENT: While we appreciate that CARB is keeping the AAM as a tool to be enacted in 2027, we believe the AAM would better serve the market if it could be applied immediately upon the LCFS Update's implementation versus waiting to 2027. This is exemplified with the credit price recently hovering around the mid- to high \$60s in direct reaction to the release of both "15-day Packages." The credit bank continues to build due to lower carbon fuels like renewable diesel expanding in the program, so implementing the AAM sooner will help work down the bank and increase pricing.

We strongly believe <u>the AAM should be triggered as early as 2025</u> if the credit bank is awash with credits (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. If left unaddressed or ineffective, the program cannot raise credit prices to levels private capital needs to further invest in low carbon fuel projects.

5. Book-and-Claim:

266.7 Book-and-claim is successfully contributing to reduced amounts of carbon and avoided methane emissions and we support CARB's position to protect it. It is the preferred method for delivering

266.7 cont. RNG in North American clean fuel programs, including EPA's Renewable Fuel Standard,¹ the Canadian Clean Fuel Regulation, the Oregon Clean Fuels Program, and the Washington Clean Fuels Program, as well as for electricity and hydrogen projects. Gas utility procurement programs for RNG also primarily use similar concepts, and Europe's Renewable Energy Directive requires book-and-claim for successful RNG project buildout in the European Union.

The second 15-day package includes a new proposal that if the number of unique Class 3-8 ZEVs reported or registered in California exceeds 132,000 ZEVs or NZEVs on December 31, 2029, then the entity reporting under bio-CNG, bio-LNG and bio-L-CNG pathways for CNG vehicles must demonstrate physical flow toward California after December 31, 2037 and not 2041. The first 15-day package required the Executive Officer to approve a "gas system map identifying interstate pipelines and their majority directional flow based on specified flow data by July 1, 2026", and therefore bio-LNG, and bio-L-CNG combustion in vehicles would need to demonstrate physical flow to California after December 31, 2037."

PROPOSED AMENDMENT: While a creative alternative since the previous proposal was difficult in which to collect mapping data, we are concerned that including classes 7-8 in this single broad threshold could inaccurately trigger this requirement when most ZEVs produced by December 31, 2029, could be light to medium-duty classes 3-6, which do not utilize much if any RNG. A trigger exclusive to classes 7-8 is a more accurate measurement of heavy-duty ZEV readiness and would better protect the RNG market and California's emission goals should estimates fall short.

We recognize both "15-day Packages" are a vast improvement over what was proposed over three years ago. We appreciate CARB's commitment to ambitious state goals and targets, backed by science-based and fuel neutral policies. The LCFS needs to be stringent and continue rewarding 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

Som Z

Ryan Kenny Policy Director – Western U.S. Clean Energy

¹ <u>https://www.biocycle.net/biogas-rng-projects/</u>



October 16, 2024

Matthew Botill Division Chief, Industrial Strategies Division California Air Resources Board 1001 I Street Sacramento, CA 95814 *VIA ELECTRONIC DELIVERY*

RE: Comments on the October 1st, 2024, Proposed Low Carbon Fuel Standard Amendments (Second 15-day changes)

Dear Mr. Botill:

UsAutoForce

I write on behalf of U.S. Venture, and our U.S. Energy subsidiary, regarding the Proposed Low Carbon
 Fuel Standard (LCFS) Amendments published October 2nd. We appreciate the California Air Resources
 Board's (CARB's) continued efforts over the last four years to balance the input of diverse stakeholders in
 developing the current LCFS update. We see missed opportunities in the results, including the decision
 to forgo a more stringent greenhouse gas reduction target. Nonetheless, we believe that the Board
 should approve this final set of changes to increase investor confidence in the future of the LCFS
 program. We will also offer comments on three specific elements of the October 2nd proposed
 amendments related to renewable natural gas (RNG).

As background, U.S. Venture is a 70-year-old family-owned company based in Northeast Wisconsin. Our vision is to be the very best provider of transportation products, sustainability solutions, and insight driving the world forward. Our more than 4,600 employees at 110 locations nationwide include more than 600 employees in California. Our U.S. Energy division is nationally recognized as an innovative leader in the distribution of renewable and traditional energy products, including RNG as a drop-in replacement for compressed natural gas (including at 72 California dispensing locations), for thermal applications and as a feedstock for hydrogen production. We have actively participated in the LCFS program since 2013 and commend CARB for continuing to be a global leader in promoting the development and use of low carbon transportation fuels.

267.2 We would like to highlight three issues in the proposed Amendments. First, the changes to deliverability requirements remain problematic for RNG development, as the proposal ties these requirements to Zero Electric Vehicles (ZEV) and Near ZEV's (NZEV) vehicle penetration in California. While we understand CARB's intention to prioritize RNG use in ZEVs if penetration goals are met, the unpredictable trigger makes it difficult for RNG developers to plan and invest. In addition, we question CARB's proposal to bar imported RNG from the North American gas system, given California's reliance on broad energy markets and the recent in-state RNG production increase. Achieving methane reductions and displacing fossil

U.S. Venture, Inc. | 425 Better Way, Appleton, WI 54915 | 920.739.6101 | www.usventure.com

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267.2 cont. gas should remain the primary focus of California's RNG policy, and we would welcome further discussions with CARB staff on this issue.

- 267.3 Second, we remain disappointed by the proposal to reduce the avoided methane crediting periods from three to two for RNG projects built after January 1, 2030. This policy will pose significant challenges for agricultural waste diversion projects that rely on LCFS revenue to justify investments. The methane avoidance components of carbon intensity (CI) scores are crucial and removing recognition of these benefits, without a replacement policy, will undermine the viability of associated projects. Reducing incentives during the critical 2025–2030 period also contradicts CARB's goals and statutory guidance, as it forces RNG projects to rely on much higher LCFS prices to recover capital costs over 20 instead of 30 years. At lower prices, LCFS revenue may not cover operating costs, and even if prices rebound, fewer projects will remain viable under this new scheme.
- 267.4 Finally, we commend the new Amendments that promote RNG use in electric vehicle fuel cells. These pathways emphasize the need for flexible accounting mechanisms, such as book-and-claim, for both gas and power. We suggest expanding this approach to include other low-emission gas power generation technologies, such as RNG-to-electric generators, or other low-emission solutions that can address California's ongoing electricity interconnection challenges. U.S. Energy recently launched a low-emission EV charging solution called Volt Vault¹, future versions of which could create electricity through any traditional or linear generator, fuel cell or other similar technology. These options should also be included in the LCFS rulemaking to help the state meet its vehicle electrification goals.

Thank you again for the opportunity to provide feedback on the proposed LCFS changes. If you would like additional information related to any of the comments above, please let me know.

Sincerely,

s/Brian Casey

Brian Casey Head of Government Affairs U.S. Venture/U.S. Energy bcasey@usventure.com

¹ https://www.us-energy.com/what-we-do/energy-marketing/volt-vault/



October 16, 2024

Chair Liane Randolph & Members of the Board California Air Resources Board 1001 I Street Sacramento, CA 95814

Via electronic submission

Re: Second 15-Day Changes to the Proposed Regulation Order

Dear Chair Randolph and Members of the California Air Resources Board:

The Indiana Soybean Alliance (ISA M&P) Membership and Policy Committee appreciates the opportunity to comment on the proposed modifications (Second 15-Day Changes) to the Low Carbon Fuel Standard (LCFS) program. ASA has welcomed engagement with the California Air Resources Board (CARB) and staff throughout this multi-year process to update the LCFS program.

ISA M&P represents our members who are Indiana soybean farmers and works with the American Soybean Association (ASA) to help shape the future for agriculture through national policy.

- 268.1 CARB's Second 15-Day Changes to revise the LCFS did not address our major concerns with provisions included in the August 15-day notice nor did it provide
 268.2 additional clarification or detail related to sustainability reporting requirements for agricultural feedstocks. We do appreciate the additional flexibility related to virgin
 268.3 vegetable oil feedstock limitations, by extending the compliance deadline to January 1, 2028, for all approved pathways at the date of adoption. However, additional feedstock limitations included in the Second 15-Day Changes document could further limit soybean oil market share in California, when compared to the August proposal.
 - In addition to the new proposals in the Second 15-Day Changes package, ISA M&P remains deeply concerned with the drastic pivot CARB has made in the past few months related to agricultural feedstocks used for biofuels. We continue to encourage that updates to the LCFS program are based on science, as required by AB-32.

Amended Feedstock Cap Considerations

8425 Keystone Crossing, Suite 200 Indianapolis, IN 46240 317-347-3620 incornandsoy.org



268.6

ISA M&P has significant concerns with the virgin vegetable oil feedstock cap that was included in the initial 15-Day Changes posted in August, especially after CARB itself noted that a cap will increase the utilization of petroleum diesel. The current proposal limits, or caps, the amount of soybean oil that is allowed to generate credits in the program at an arbitrary 20%. Now, CARB is expanding on this cap in its Second 15-Day Changes with the inclusion of sunflower oil. Adding additional feedstocks to the 20% aggregate cap will further limit market access for soybean oil and additional gallons of low-carbon fuels.

Based on CARB's own analysis, a cap on credit generation for vegetable oil feedstocks will lead to an increase in fossil diesel use compared to the status quo. While ISA M&P agrees that all feedstocks entering the California LCFS market should maintain fidelity to the assumptions underlying their life-cycle assessment (LCA), domestic agricultural feedstocks are facing a redundant, triple penalty through an outdated indirect land use change (ILUC) score, stringent sustainability reporting requirements, and a proposed arbitrary cap on credit generation while all other feedstocks, including imports, do not face the same restrictions.

The proposed cap increases soy's carbon intensity (CI) score for amounts over the cap from the established pathway, which is based on science, to the benchmark CI, which is not based on an LCA for soy. This is effectively increasing soy's ILUC score by upwards of 50% for many pathways without a scientific basis. In fact, CARB has refused to use new data related to ILUC while at the same time effectively increasing it by an arbitrary amount.

The increase in ILUC for ag feedstocks above the 20% threshold will effectively shut them out of the LCFS. Biomass-based diesel provides GHG and emissions benefits that are unpriced by the market. As a result, they cost more to produce than they can be sold for and rely on policy to account for these benefits. Without the credit generation, soy will not be able to compete against waste feedstock imports, thereby capping use in the LCFS.

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 North American agricultural feedstocks for biofuel production are already held to a high standard for participation in the Renewable Fuel Standard (RFS) and the Canadian Clean Fuels Regulations. Rather than adding additional sustainable North American feedstocks to its arbitrary proposed cap, CARB should consider updating carbon intensity analysis and oversight of imported feedstocks, which are not held to the same level of accountability.

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268.7



While ISA M&P is steadfast in its opposition to the virgin vegetable oil feedstock cap and the rationale used to reach this conclusion, the Second 15-Day Changes added some additional flexibility to come into compliance with the arbitrary cap. We appreciate CARB's acknowledgement that biofuel production facilities cannot shift production overnight, and thank CARB for updating the grandfathering clause to provide a 2028 compliance date for all approved pathways in the LCFS program.

Carbon Intensity Scoring and Auto Acceleration Mechanism

ISA M&P remains concerned that without a comprehensive update to the Global Trade Analysis Project model for biofuels (GTAP-BIO) that CARB utilizes, soy-based feedstocks will be phased out of the LCFS even without the additional limitations being proposed in the Second 15-Day Changes. Current data indicates a much lower CI score for soybeans, as growers continue to improve soil practices, limit water use, lower onfarm emissions and more. On the one hand, CARB is recommending stringent sustainability guardrails for U.S. soy, but on the other hand is still on track to likely phase-out soy-based biofuels from credit generation by approximately 2035 or sooner.

As CARB looks to develop a more aggressive auto acceleration mechanism to reach CI reduction benchmarks sooner, using outdated methodologies will only limit the output of actual improvement over time in terms of emissions reductions. As CARB updates all other major lifecycle emissions models through this rulemaking, we once again urge action to update the GTAP-BIO model so that the most current, science-based data may be used to determine carbon intensity reductions.

268.14 In terms of updating the timeline for analysis of data to trigger the auto acceleration mechanism, ISA M&P appreciates that CARB is seeking to provide additional notice to the market before a trigger is implemented through the ability to analyze data quarter over quarter rather than just annually. This will allow the industry more time to plan and make business decisions ahead of new benchmarks triggering.

Sustainability Guardrails and Traceability Concerns

268.15 ISA M&P remains very concerned about the sustainability guardrails. The sustainability guardrails are more onerous than the specified source requirements used for waste feedstock imports. Palm oil in Southeast Asia has had forced labor concerns¹, but

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¹ https://apnews.com/article/virus-outbreak-only-on-ap-indonesia-financial-markets-malaysia-7b634596270cc6aa7578a062a30423bb



268.15 cont.
 268.16 CARB does not require used cooking oil derived from palm to track social or economic sustainability. Concerningly, petroleum also does not have to track these criteria. CARB's proposal makes it administratively easier to use non-sustainable petroleum² in the state than biofuels that have lower CI scores and are produced from sustainable feedstocks grown in the United States. Land use change is already captured in the ILUC score, which makes it unclear what purpose the guardrails serve.

The Second 15-Day Changes offered a bit more detail about how CARB plans to implement its reporting and requirements in terms of traceability, but we continue to have serious concerns about how this proposal will work in practice. By way of background, soybean products pass through many hands before final use. A soybean is produced, potentially transported to a grain elevator, then must reach a soybean processor to be separated into soybean oil and soybean meal (crushed). The meal and oil can then be delivered to end users. Because of this, ensuring the identity preservation of a soybean is not easily accomplished. Soybeans are a bulk commodity, and infrastructure in the U.S. was not developed to segregate subunits of the crop. This bulk handling system based on comingling is one of the inherent advantages the United States has as it reduces transportation costs, and subsequently on-ground emissions.

CARB's proposal states that farmers will have to declare the geographical shapefiles or coordinates of farm boundaries starting in 2026. This raises many issues including the definition of a farm and how grain must be traced and reported if harvested from several fields but comingled at storage. While the deforestation requirements do not start until 2028, the questions posed above are relevant for the attestations starting in 2026. At that point, farmers will have to declare the boundaries of their farm. CARB settling on one definition for 2026 and another for 2028 would create much confusion. Educational efforts will be needed ahead of 2026. Once farmers understand the program, it will be very difficult to change fundamental definitions.

While 2026 may seem like plenty of time, it is much less for farmers in practice. Soybeans available starting at the beginning of 2026 are from the crop harvested in the fall of 2025 and planted in the spring of 2025. Farmers are purchasing inputs for that crop currently. If delivery points for the next soybean crop require data disclosure, producers need to know that now as they plan out their upcoming crops and lock in investments. So, if new LCFS regulations are not finalized until January 2025 and planting begins in March 2025, it leaves virtually no planning time for a farmer to update practices to adhere to these new attestation requirements.

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² https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2022.858512/full



268.19

If CARB insists on agricultural feedstock traceability, then it should reward sustainable practices beyond what is already assumed in the LCA. For instance, some soybeans are double cropped meaning they are grown as a secondary crop following a primary crop within a growing season. They are not displacing other crops or land uses. Double-crop soybeans should be eligible to have the ILUC component of the CI score removed, or at least shared with the other crop in the rotation.

Entities Eligible to Apply for Fuel Pathways

ISA M&P is concerned about CARB's proposal to give the Executive Officer the discretion to stop accepting new pathways for biomass-based diesel starting in 2031. We do not understand how this benefits the LCFS. Under AB-32, CARB must under statute minimize costs and maximize GHG reductions. It is unclear how this is served by rejecting new pathways. In fact, the LCFS is best served by allowing the most available pathways. If these pathways cannot achieve cost-effective GHG savings, they will not be utilized by the market in the LCFS. In essence, an increase in pathways can only serve to improve GHG benefits in California. Singling out a single fuel for prejudicial treatment is baffling given the goals of the LCFS and the authority that establishes it.

Recommendations to CARB

As CARB finalizes its update to the LCFS, ISA M&P aligns itself with the American Soybean Association (ASA) recommendations that will likely prevent an increase in fossil diesel use, improve carbon intensity calculations, and improve market access for sustainable agricultural feedstock providers.

First, CARB should not apply the vegetable oil feedstock cap proposal to North American feedstocks. As noted above, these feedstocks are already subject to guardrails to ensure production on land that has not been converted since 2008. The RFS was designed specifically to prevent land conversion for biofuel production, and U.S. Department of Agriculture (USDA) data shows a decrease in farmland over the same period.

Second, CARB should convene an expert working group to consider issues related to the sustainability provisions and indirect land use change. CARB has utilized working groups in the past to analyze complex issues related to the LCFS and this is no different. Through meetings with CARB staff and board members, decisions are being made using competing schools of thought. Gathering experts to coalesce around an

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268.23 agreed upon science-based approach moving forward would ensure that CARB is utilizing the best information available. We recommend that this expert working group convenes in 2025 and provide recommendations by October 2026.

268.24 Lastly, CARB must undertake a comprehensive update of the GTAP-BIO model for soybean oil used in biofuel production. Without using the most up-to-date and accurate data, CARB is doing a disservice to the feedstock producers and California's citizens by calculating carbon intensity scores not rooted in current fact. Through CARB's own analysis we know that basing decisions off old data will lead to more—not less—emissions in the California transportation sector.

Conclusion

- 268.25 ISA M&P is encouraged by the continued successes of programs that support the development of cleaner, low-carbon fuels. However, it is critical that CARB finalizes updates in a way that does not arbitrarily exclude agricultural feedstocks through policies that are not science-based and run afoul of CARB's mandate, including capping vegetable oil feedstocks and applying onerous sustainability guardrails that add cost without rewarding farming practices that lower CI.
- 268.27 CARB's Second 15-Day Changes did not address any of the fundamental issues raised by soybean farmers in the first 15-Day Changes and fails to acknowledge the potential unintentional consequences of a feedstock outlined by its own employees only a few months before. CARB is required under the law to achieve the maximum technically feasible and cost-effective reductions in GHGs. The two most recent 15-Day Changes show a lack of willingness to achieve the statutory obligations set forth in AB-32.

ISA M&P is eager to continue working with CARB to support the role of agriculture in diversifying the fuel supply while reducing GHGs and increasing clean air 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,

Steve Howell Senior Director of Industry Affairs Indiana Soybean Alliance

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VIA ELECTRONIC FILING

October 16, 2024

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



Re: RNG Coalition's Comments on Low Carbon Fuel Standard 15-Day Amendments

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 October 1, 2024 Second Notice of Public Availability of Modified Text and Availability of Additional Documents and/or Information for the Proposed Low Carbon Fuel Standard (LCFS) Amendments (Second 15-Day Package).

- We thank CARB staff for continued adjustments to various RNG provisions in the Second 15-Day Package. Specifically, we support the expanded opportunities for RNG-to-electricity via fuel cells
 generation used in electric vehicle pathways. We recommend that same treatment be extended to other clean sources of power production, including linear generators.
- 269.3 We also support the updates to the Automatic Accelerator Mechanism. Triggering the AAM mechanism off a rolling quarterly assessment is preferable to using an annual look-back. Clearer timing of when the adjustment would impact the market should be supplied.

Other specifics of the 15-Day Package continue to create uncertainty about RNG investment. Programmatic ambition remains well below what would provide an appropriate response to the dire threat of climate change. Further, complex triggers on RNG deliverability rules and timing for reduced recognition for avoided methane crediting remain unclear. These arbitrary decisions have ensured there will be fewer RNG projects motivated by the LCFS and have limited how the RNG industry can contribute to California's methane reduction goals.

Sincerely,

/S/ Sam Wade Director of Public Policy Coalition for Renewable Natural Gas

¹ For more information see: <u>http://www.rngcoalition.com/</u>

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269.5 **1** This Rulemaking Represents a Lost Opportunity for Climate Progress. Four Years of LCFS Uncertainty and Low Credit Prices Has Slowed Growth in All Low Carbon Fuels.

1.1 The Second 15-Day Package Should Be Adopted to Address Near-Term Oversupply. However, the Proposal Fails to Maximize LCFS GHG Abatement and is an Insufficient Response to the Magnitude of the Climate Crisis.

Climate change impacts are in the headlines again. Sacramento recorded the hottest temperature experienced in October since weather recordkeeping began (nearly 150 years ago) following a summer that contained the hottest 20-day stretch in the city's history.^{2,3} The Southern portions of the United States were hit by devastating back-to-back hurricanes in just the past few days.⁴ Ensuring that the LCFS is ambitious enough to continue California's leadership on clean fuels and match the magnitude of the climate challenge remains the most critical topic addressed in this rulemaking.

Incenting private capital to invest in a diverse portfolio of low carbon fuels to achieve all technologically feasible GHG reductions in a cost-effective fashion was previously a cornerstone of the LCFS program. CARB initiated discussion of how to increase LCFS targets almost exactly four years ago,⁵ yet much of the period since has been spent probing (and at times degrading) these core programmatic concepts rather than building on prior LCFS success.⁶

Throughout this process, RNG Coalition and a diverse group of clean fuel voices contracted with the consulting firm ICF to independently analyze what level of greenhouse gas improvement is feasible from clean fuels and related sectors. ICF's work continues to show significantly different outcomes than CARB's analysis, especially with respect to the greater magnitude of greenhouse gas benefit that could be achieved by RNG and other clean fuels, the rate of drawdown of the credit bank, and associated cost and price trends.

Simply put, if all clean fuels were more clearly incented, greater GHG reduction—at less cost than predicted by CARB's analysis—would occur. Even with the constraints in the proposal through the Second 15-Day Package, the ICF work continues to show that a CI reduction of >40% by 2030 is feasible, which would be in-line with economy wide goals for GHG reduction.

269.6

The rule should be adopted as proposed at the November hearing, because the proposed increase in near-term stringency is needed to address near-term oversupply. However, CARB should also commit to returning to the rule to considering at least a 35% CI reduction by 2030 through a future rulemaking.

² <u>https://www.sacbee.com/news/local/article293455944.html</u>

³ https://www.sacbee.com/news/weather-news/article290082049.html

⁴ <u>https://www.worldweatherattribution.org/yet-another-hurricane-wetter-windier-and-more-destructive-</u> because-of-climate-change/

⁵ See the October 14, 2020, CARB LCFS Workshop that discussed how to begin to improve the LCFS targets to align with the Governors Executive Order N-79-20 which states we needed to, "more quickly move toward our low-carbon, sustainable and resilient future." See: <u>https://ww2.arb.ca.gov/sites/default/files/2020-10/101420presentation_carb.pdf</u>

⁶ Back in 2020 the LCFS was being praised for its effectiveness and seriously being considered by many other jurisdictions: <u>https://ghginstitute.org/2020/01/22/the-low-carbon-fuel-standard-has-succeeded-but-how-does-it-work/#:~:text=So%20far%2C%20California%20has%20successfully,2018)%20with%20its%20LCFS%20program.</u>

269.7 1.2 We Support the Auto Acceleration Mechanism Being Able to Trigger Earlier

The changes to the Auto Acceleration Mechanism (AAM) in the Second 15-day Package are positive. Evaluating the AAM on a rolling four quarter basis is more likely to detect oversupply more quickly than evaluating on only a calendar-year basis.

- 269.8 However, the implementation schedule post-trigger could be further clarified. For example, if the AAM triggers based on 2027 Q2 2028 Q1 (and CARB has all needed data on 7/31/2028), would the acceleration event trigger on 1/1/2029 or would it wait until 1/1/2030? We recommend that CARB staff develop and publish examples through a future guidance document and allow for the correction to trigger as soon as possible after an oversupply is detected.
 - 2 Some of the Second 15-Day Package RNG-Related Changes Are Helpful, but More Clarity is Needed to Improve RNG Investor Confidence and Increase the Pace of Methane Emissions Abatement by 2030

269.9 2.1 Shift in Crediting Periods Allowed for Avoided Methane Needs More Clarification

We remain disappointed that CARB plans to reduce the total number of crediting periods for avoided methane emissions for RNG projects from three to two. This is an extremely problematic change as both agricultural and organic waste diversion projects are heavily dependent on LCFS revenue for profitability, driven by the avoided methane components of their CI scores, and recognition for this GHG benefit should not simply be ignored (as we've stated in prior comments, such credit should be given unless and until a replacement policy is put in place).

Providing *less* incentive to develop methane capture projects during the critical period between 2025 and 2030 seems counter to statutory direction and CARB's own goals. Attempting to recover capital costs over 20 years will mean that RNG projects built between 2025 and 2030 will need much higher LCFS prices, all else equal, than they would if they receive a full 30 years of avoided methane crediting. At low prices, LCFS revenue (with avoided methane recognition) cannot even cover operating costs in some cases. Even if LCFS prices recover more quickly, as suggested by the scenarios in Attachment C to the First 15-Day Package, fewer RNG projects will be viable because of this proposed change.

Further, while the Second 15-Day Package attempts to clarify when this transition from three to two periods occurs, it fails to fully alleviate concerns that existing projects will unintentionally be impacted. We request additional guidance from CARB on this topic. Taking away crediting periods from projects that are already built is classic change-in-law risk (colloquially called "stroke-of-the-pen" risk when government acts in an arbitrary fashion) a concept we warned against in detail in our informal workshop comments back on December 21, 2022.⁷

For the initial years of the LCFS, prospective low carbon fuel producers included anticipated credit revenue in financial models and the investors would ignore or heavily discount the LCFS line item, due to perceived change-in-law risk. CARB should be motivated to do all it can to avoid this prior paradigm of

⁷ https://www.arb.ca.gov/lists/com-attach/74-lcfs-wkshp-nov22-ws-U2FSZINjWThWYgMy.pdf

269.9 cont. market distrust. Unfortunately, this rulemaking has instead reignited these fears and soured many clean tech investors on the program.

269.10 2.2 Deliverability Trigger is Impossible to Predict

The Second 15-Day Package's changes to deliverability requirements are also still problematic for RNG development. The new proposal is to trigger the timing of deliverability requirements for RNG to natural gas vehicle pathways based on medium- and heavy-duty zero-emission (ZEV) and near-zero-emission (NZEV) vehicle penetration.

While we understand conceptually that CARB may not want RNG to be used in natural gas vehicles if ZEV penetration goals succeed, and we support ZEV uses of RNG, the trigger itself is not something that RNG developers are comfortable predicting. Because LCFS crediting requires having an established end use for the RNG (to receive pathway approval) and because projects need to understand eligibility for federal Renewable Fuel Standard credits, investment in methane reduction cannot be made with much certainty based on this trigger.

Given that California clearly benefits from broad North American and global energy markets for other types of energy—and the recent trend toward significant increases of the California-based supply of RNG,⁸ with in-state production increasing from 6.74% in 2021 to 18.23% in 2023—we continue to question why CARB would propose eliminating imported RNG eligibility from any portion of the North American gas system.

All RNG projects produce the desired benefits of displacing fossil gas, and most create significant methane reductions. Achieving these benefits should remain the primary focus for California RNG policy. RNG stakeholders will be happy to engage further with CARB staff on this topic.

269.11 2.3 4-to-1 Penalty Should be Eliminated

It is disappointing to see the Second 15-Day Package retains a "4-to-1" penalty for the case where a verified CI is higher than the certified CI. This is overly punitive. We continue to recommend that, if the verified CI is higher than the certified CI, the project should simply repay CARB for any excess credits claimed, and not be subject to any further enforcement liability (unless there is malfeasance or other such separate cause).

269.12 2.4 Linear Generators Should Be Treated Like Fuel Cell to EV Pathways

We are happy to see changes in the Second 15-Day Package encouraging RNG to be provided to fuel cells for power generation when that power can be matched to electric vehicle use. We believe this combination of clean technologies has multiple "wins" for the environment—both from a criteria pollutant and GHG reduction perspective.

The framework for RNG/biogas to power to EV pathways could be further improved by allowing other forms of low-emission gas power generation to use the same accounting framework. Power production matched to EVs is generally an option RNG Coalition members want to have available. We continue to encourage ARB to approve a temporary pathway for other forms of electricity (e.g., generated by biogas

⁸ https://ww2.arb.ca.gov/resources/documents/lcfs-data-dashboard

269.12 cont. on site through non-fuel-cell technologies, generated at the best combined cycle plants, etc.). When no temporary pathway at all exists for these projects, they cannot take advantage of the true-up opportunity created by the new rule and are, therefore, much harder to finance.

We would prefer to see technology-neutral performance metrics so that power generation that meets similar efficiency and/or emissions profiles as fuel cells are equally recognized. For example, linear generators are now serving truck charging demand at The Denker Hub associated with the Port of Long Beach.⁹ At a minimum, this technology should be treated in an equivalent fashion to fuel cells.

Such pathways also demonstrate the importance of flexible accounting mechanisms for both renewable gas and power. RNG suppliers are smaller sources of gas, each fuel cell's gas demand is individually modest and distributed (compared to the average utility-scale gas power plant), and EV load is also often distributed. Only through flexible accounting mechanisms—like book-and-claim for both gas and power—can this useful combination of technologies be properly recognized and incented under the LCFS.

3 Conclusion

RNG Coalition appreciates the opportunity for continued engagement on these topics and CARB's timely release of the Second 15-Day Package. CARB should adopt the Proposed Rule in November. While imperfect, the proposed rule can still help leverage renewable gas production to reduce methane emissions, improve organic waste management, and decarbonize California's transportation sector.

We thank CARB for your continued work toward these goals and look forward to the successful conclusion of the LCFS rulemaking and future continued work on the issues identified above.

⁹ <u>https://www.prologis.com/insights/success-stories/north-americas-largest-heavy-duty-ev-charging-hub-powered-microgrid</u>

October 16, 2024

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

Re: Comments on the Second Proposed 15-Day Changes to the Low Carbon Fuel Standard (LCFS) Amendments

Dear Ms. Sahota:

We represent a group of distinct businesses and perspectives related to the Low Carbon Fuel Standard (LCFS) and the State's various climate change-related programs. Individually, we each have specific priorities and recommendations for the program, which we may address in separate comment letters. Collectively, however, we agree that the LCFS is a critical program for achieving the State's methane reduction, transportation electrification, and other climate change related goals.

- We would like to thank CARB for incorporating additional flexibility in the recent proposed 15-day changes to the LCFS, particularly the added flexibility for Heavy-Duty Fast Charging Infrastructure (FCI)
 crediting. We also appreciate that CARB has recognized the importance of book-and-claim access for biomethane-to-electricity pathway crediting, which reflects the Board's openness to feedback from stakeholders like us.
- 270.3 However, we are concerned that book-and-claim accounting for electricity pathways may exclude linear generators and green hydrogen-to-electricity as an eligible pathway. As Prologis' pioneering real-world efforts to speed development of industrial charging infrastructure for heavy-duty electric fleets shows, linear generators are a critical technology to meet our customers' and the state's heavy-duty electrification goals with similar emissions (essentially zero) as fuel cells but also immediately affordable, flexible between hydrogen- and biomethane-to-ZEV pathways, and able load-follow megawatt-level EV charging events without degradation. Linear generators are now eligible under California's Renewable Portfolio Standard (RPS) and are business critical to enterprises such as Prologis, which sees 36% of U.S. goods move through its U.S.-based facilities.¹

Explicitly allowing book-and-claim access for green hydrogen-to-electricity pathways would provide additional flexibility for supporting the state's transportation electrification and renewable hydrogen goals. We ask that the Board to clarify that linear generators are an eligible technology under the biomethane-to-electricity book-and-claim provisions. We also ask that CARB enable book-and-claim accounting for green hydrogen-to-electricity pathways via hydrogen-blending gas distribution networks within California. Our feasibility assessments show warehouse rooftop solar electrolysis supplying electric vehicle charging hubs can be an economical and expedient pathway to decarbonization in California.

Linear Generators Now RPS Eligible, Like Fuel Cells

The clean emissions performance of linear generators and comparability to fuel cells was recently

¹ <u>https://www.prologis.com/news-research/economic-impact-report</u>

270.3 cont. validated through AB 1921, which was signed into law by Governor Newsom last month. AB 1921 explicitly includes linear generators using renewable fuels as eligible under the state's RPS, just like fuel cells currently are. <u>This bill received no "no" votes throughout the process</u>, reflecting widespread stakeholder buy-in and strong legislative intent to promote linear generators as part of California's broader clean energy goals. We urge CARB to align the LCFS regulations with this legislation by expressly including linear generators as eligible technology for biomethane-to-electricity crediting.

Linear Generators: Clean Technology with Low Emissions

Linear generators, such as those developed by Mainspring and Hyliion, are clean, low-emission technologies. We understand that CARB staff have seen data comparing emissions from linear generators to those from fuel cells, which demonstrate similar criteria pollutant emissions between the technologies. Indeed, data for Prologis' Denker Avenue EV charging depot in Los Angeles shows that linear generators achieve more than 97% NOx reductions compared to diesel trucks, with minimal VOC emissions *(see appendix following letter)*. These results demonstrate the technology's potential for significant emissions reductions, particularly in applications supporting electric vehicle (EV) charging. Including linear generators in the LCFS program aligns with CARB's objectives of reducing transportation-related emissions and promoting cutting-edge, clean technologies.

As detailed in our previous comments,² Prologis Mobility and Performance Team, a Maersk company that operates electric vehicles across the country, recently demonstrated a unique solution to infrastructure challenges facing heavy-duty fleet operators by developing the world's largest EV charging project powered by a self-sufficient microgrid, which uses Mainspring technology with green hydrogen, renewable natural gas, and green methanol fuel flexibility.³ The project was constructed in five months, rather than the years it would have taken otherwise (as estimated by the local utility), allowing the fleet to electrify quickly while interconnection to the electrical grid proceeds later. Once the project is directly interconnected to the grid, the added resiliency for critical EV fleet operations during periods of grid stress or power outage will be critical. The infrastructure also preserves partial infrastructure flexibility for expanding to support fuel cell vehicles in the future. This is a replicable model that can serve to accelerate progress toward the State's ZEV goals.

The ability to use renewable fuels, such as biomethane or renewable hydrogen, would further align these projects with California's climate goals. Explicitly including linear generators would provide additional market clarity and flexibility to support the use of this pioneering model to overcome infrastructure challenges that hinder CARB's transportation electrification goals. Similarly, allowing for book-and-claim access for renewable hydrogen-to-electricity pathways would provide additional optionality and cost savings to support resilient, renewable EV charging.

Critical technoeconomic risk mitigations of linear generators

Linear generators offer critical real world operational risk mitigations that make them especially important tools for EV charging infrastructure:

• **Cost-Effective**: Linear generators today are 25%-50% the capital cost of commercially available fuel cells. They also last for 20 years and do not degrade which results in significantly lower

² <u>https://www.arb.ca.gov/lists/com-attach/7539-lcfs2024-VDdSNVMgUmMHXgBi.pdf</u>

³ <u>https://www.prologis.com/insights/success-stories/north-americas-largest-heavy-duty-ev-charging-hub-powered-microgrid</u>

270.3 cont.

maintenance and lifecycle costs of electricity for our customers.

- **ZEV pathway flexible**: Linear generators can handle the volatility and nascency of green fuel markets today by allowing fuel switching from one green fuel to another green fuel during times of supply chain stress for the incumbent. For example, the margin for error is unacceptably small in operations that use fuel cells for the next few years while green hydrogen supply chains are in infancy.
- **Dispatchable**: Linear generators are genuinely dispatchable machines. For a business with many challenging load profile cases this makes their selection simple and makes designs and maintenance programs transferable from one site to the next.
- **Efficient**: Linear generators have exceptional fuel efficiencies that are competitive, predictable and do not degrade. This is critical for low lifecycle costs of electricity for our customers.

These features, along with their low emissions profile, make linear generators an ideal fit for California's LCFS book-and-claim program.

Conclusion

We strongly support the LCFS and greatly appreciate CARB's continued leadership in refining the program to support the State's transportation electrification goals and foster growth of low-carbon technologies. By explicitly including linear generators in the program, CARB can further accelerate the deployment of low-emission EV charging infrastructure and align the program with the AB 1921 statute. We look forward to continuing to collaborate with CARB to meet California's ambitious climate goals. The exact changes we request are shown below the signatures.

Thank you for considering these comments and recommendations.

Respectfully submitted,

Alexis Moch Vice President, Government Affairs Prologis

Kent Leacock Senior Director, Public Affairs Mainspring **Bobby K. Cherian** Senior Vice President, Government Affairs Hyliion Inc

Allie Detrio Senior Advisor Microgrid Resources Coalition

270.3 cont. Section §95488.8(i)(2):

Book-and-Claim Accounting for Pipeline-Injected Biomethane Used as a Transportation Fuel, to Produce Electricity for EV Charging, or to Produce Hydrogen. Indirect accounting may be used for RNG used as a transportation fuel, to produce electricity using a fuel cell<u>, including a linear generator</u>, for EV charging, or to produce hydrogen for transportation purposes (including hydrogen that is used in the production of a transportation fuel), 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 to produce electricity using a fuel cell, including a linear generator, for EV charging, or as an input to hydrogen production, 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 to produce electricity using a fuel cell, including a linear generator, for EV charging, or as an input to hydrogen production must demonstrate compliance with the following requirements:
 - 1. Starting January 1, 2041, for bio-CNG, bio-LNG and bio-L-CNG pathways, and January 1, 2046, for biomethane used to produce electricity using a fuel cell, **including a linear generator**, for EV charging, or as an input to hydrogen production, 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. Notwithstanding the above, if the number of unique Class 3-8 ZEVs reported or registered in California exceeds 132,000 ZEVs or NZEVs on December 31, 2029, based on the evaluation and notification specified by subsection 95488(d)(1), then the entity reporting under bio-CNG, bio-LNG and bio-L-CNG pathways for CNG vehicles must demonstrate the physical flow listed above after December 31, 2037. 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.
- (C) To substantiate RNG quantities injected into the pipeline for dispensing as bio-CNG, bio-LNG, or bio-L-CNG, or to produce electricity using a fuel cell, including a linear generator for EV charging, or as an input to hydrogen production, the pathway application and subsequent Annual Fuel Pathway Reports must include the following documents linking the environmental attributes of RNG (in MMBtu or Therms) with corresponding quantities of natural gas withdrawn:
 - 1. Unredacted monthly invoices showing the quantities of RNG (in MMBtu) sourced and the contracted price per unit;

- 270.3 cont. 2. Unredacted contract by which the fuel pathway holder obtained the environmental attributes.
 - (D) Starting January 1, 2041, for bio-CNG, bio-LNG and bio-L-CNG pathways (unless the accelerated timeline is activated by the criteria described in section 95488.8(i)(2)(B)1.), and January 1, 2046, for biomethane used to produce electricity using a fuel cell, including a linear generator for EV charging, or as an input to hydrogen production, to substantiate RNG quantities injected into the pipeline for biomethane fuel pathways associated with projects that break ground after December 31, 2029, the pathway application and subsequent Annual Fuel Pathway Reports must include the documents required by section 95488.8(i)(2)(C) as well as the following documents.
 - 1. Monthly pipeline nomination reports for each pipeline along the delivery path.

270.3 cont. Section §95488.8(i)(3)(A):

(A) Low-CI hydrogen is injected into a **dedicated hydrogen** pipeline physically connected to California.

Table 8. Temporary Pathways for Fuels with Indeterminate CIs

Fuel	Feedstock	Process Energy	CI (gCO2e/MJ)
Low-Cl electricity	Biomethane from Dairy	N/A	-300
produced by fuel cell <u>or</u>	and Swine Manure		
linear generator			
Low-Cl electricity	Electrolysis of Water	N/A	<u>110</u>
produced by fuel cell	using zero-Cl or		
or linear generator	Negative-Cl electricity		

Appendix - Comparison of Emissions of Alternative technologies at Denker



MEMORANDUM

June 28, 2024

TO: JT Steenkamp, Prologis

FROM: Patrick Couch, GNA

SUBJECT: Comparison of emissions for alternative technologies at Denker

Background

Prologis operates a microgrid at its Denker facility in Los Angeles designed to support charging of heavyduty electric vehicles. The microgrid includes 8.64MW of EV chargers (24x 360kW chargers), supplied by ~10MW of peak on-site power via 2.76MW of linear generators and 7.2 MW (18MWh) of battery storage. The facility enables the use of heavy-duty electric vehicles (HDEV) that avoid emissions from traditional diesel trucks that would otherwise operate from the facility. However, the site's use of linear generators does entail some direct emissions. This memorandum summarizes the methodology and results used to compare the emissions associated with the Denker facility under a diesel baseline, the constructed HDEV project, and two alternative technology options; 1) the use of near-zero emission natural gas trucks and 2) the use of solid oxide fuel cells (SOFC) in place of the linear generators.

Methodology

Emissions for oxides of nitrogen (NOx), particulate matter (PM2.5 and PM10), and volatile organic compounds (VOC) were characterized for each technology option, with two exceptions. PM emissions data were not available for the linear generator or SOFC technologies. All emissions were characterized on a grams-per-mile basis as this most uniformly compares the work done by the trucks that would operate at the facility. Further, all trucks were assumed to be Class 8 semi-tractors typical of trucks serving the San Pedro Bay Ports and operating in local goods movement.

Data sources and specific methods by technology type

Diesel – emissions data for each pollutant were taken from California Air Resources Board's (CARB) EMFAC emissions model for on-road vehicles. EMFAC is the required emissions model for estimating emissions inventories as part of the State Implementation Plan required under the federal Clean Air Act. The model provides estimates of total emissions (tons per year) for each pollutant and total miles traveled per year by vehicle type. Note that the EMFAC model provides emissions for Reactive Organic Gases (ROG) and it was assumed that ROG and VOC emissions are approximately equal.

For this analysis, the baseline diesel truck emissions and activity reflected the following EMFAC settings:

MODEL SETTING	VALUE
Region	South Coast Air Basin
Calendar Year	2022
Vehicle Category	T7 POLA Class 8
Model Year	2015
Speed	Aggregate

www.trccompanies.com

To: JT Steenkamp, Prologis Subject: Comparison of emissions for alternative technologies at Denker Date: June 28, 2024

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CNG with Near-zero Engine – emissions data for each pollutant were taken from EMFAC. The truck model year is assumed to be 2022 and is intended to reflect an alternative deployment of new vehicles (CNG rather than EV). The following EMFAC settings were utilized:

MODEL SETTING	VALUE
Region	South Coast Air Basin
Calendar Year	2022
Vehicle Category	T7 POLA Class 8
Model Year	2022
Speed	Aggregate

MFC to EV – this scenario reflects direct emissions occurring from natural-gas fueled linear generators (also called a "mechanical fuel cell" or MFC) associated with the generation of electrical energy needed to charge and power a Class 8 HDEV. Test data provided by the generator manufacturer, Mainspring Energy, were used to derive emissions from the generator on a grams-per-kilowatt-hour (g/kWh) basis. Emissions data were averaged over three tests and included two "cores" or power-generating units. Testing was performed under South Coast Air Quality Management District (SCAQMD) test methods 100.1, 2.3, 4.1, and 25.3.

Energy-specific mass emissions from the generators (in g/kWh) were converted to grams per mile of HDEV operation assuming an energy economy of 2.1 kWh/mile. This factor is consistent with energy economies reported for Class 8 trucks operating in the South Coast Air Basin in drayage and local goods movement.

SOFC to EV – this scenario reflects direct emissions occurring from a solid oxide fuel cell associated with the generation of electrical energy needed to charge and power a Class 8 HDEV. Emissions data were based on the Series 10 product fueled with standard pipeline natural gas. Data provided by the generator manufacturer were used to derive emissions from the generator on a grams-per-kilowatthour (g/kWh) basis. Testing was performed under SCAQMD test methods 100.1 and 25.3.¹

Energy-specific mass emissions from the generators (in g/kWh) were converted to grams per mile of HDEV operation assuming an energy economy of 2.1 kWh/mile. This factor is consistent with those reported for Class 8 trucks operating in the South Coast Air Basin in drayage and local goods movement.

Results

Based on the assumptions and data sources described above, the following emissions rates were calculated for each technology type.

PROJECT TYPE	NOX (G/MI)	PM 2.5 (G/MI)	PM 10 (G/MI)	VOCS (G/MI)
Linear Generator with NG	0.06	N/A	N/A	0.06
Solid Oxide Fuel Cell	0.002	N/A	N/A	0.01
Diesel Trucks	1.78	0.03	0.03	0.04
CNG NZE Trucks	0.32	0.003	0.003	0.02

¹ https://www.bloomenergy.com/wp-content/uploads/Series10-V12.pdf

www.trccompanies.com

To: JT Steenkamp, Prologis Subject: Comparison of emissions for alternative technologies at Denker Date: June 28, 2024

As shown, the linear generator and SOFC technologies offer the lowest NOx emissions rates, providing over 96% NOx reductions relative to the diesel baseline.

As previously noted, PM emissions data were not available for the SOFC and linear generator but are expected to be very low owing to the continuous (not intermittent) fuel oxidation processes that are inherent in these technologies.

VOC emissions for all technologies are very low. Typically, diesel engines emit VOCs predominantly as hydrocarbons. Certification levels for hydrocarbon emissions from diesel engines are often 90% or more below the current State and federal emissions limits. As all technologies produced VOC emissions of the same order of magnitude as the baseline diesel engine, it is evident that the VOC emissions are well below the existing diesel standards.



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California Air Resources Board (CARB) Low Carbon Fuel Standard (LCFS) Proposed Amendments | Stakeholder Feedback

271.1 This comment is intended to recommend the use of the carbon-14 testing method to determine the share of biogenic carbon content of Tier 2 fuels and throughout biomethane supply chains. Biogenic content measurements following methods such as ASTM D6866 Method B currently provide critical value to prominent clean fuel standard programs around the world and should be treated as critical information on a fuel's environmental attributes.

Included here you will find:

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Recommendations for CARB's Proposed LCFS Amendments

271.1 Our recommendation is that CARB's proposed amendments to the Low Carbon Fuel Standard (LCFS) cont. should include direct biogenic content testing requirements following the ASTM D6866 Method B standard for all Tier 2 fuels and throughout biomethane supply chains. Routine biogenic testing requirements currently play a critical role in the United States Renewable Fuels Standard (RFS) and the European Union's Renewable Energy Directive (RED) for their regulation of many biofuels, including biogas upgraded to renewable natural gas (RNG) or biomethane fuels. This comment is specifically meant to address § 95488.7 on Tier 2 Fuel Pathway requirements and § 95488.8 on Fuel Pathway application requirements for all classifications.

Extend Biogenic Testing Requirements to All Tier 2 Fuels

For § 95488.7 on Tier 2 Fuel Pathway requirements our recommendation is that all Tier 2 pathway applications be required to submit routine biogenic testing following ASTM D6866 Method B. Biogenic



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271.1 testing is currently required for Tier 2 fuels that are produced by co-processing.¹ This requirement should cont.
be extended to all Tier 2 applications because biogenic content is a key environmental attribute to track for any fuels credited under the program. The sustainability documentation required for Tier 2 applications under § 95488.7(a)(4) pursuant to § 95488.9(g) should include routine biogenic test results. This is the only way to guarantee the renewable content of fuels credited under the program.

We recommend reviewing Canada's Clean Fuel Regulation (CFR) requirements for claiming biomass as renewable feedstocks, which include routine direct testing following ASTM D6866. By requiring testing of feedstocks through final products the CFR program is able to accurately quantify renewable content throughout the supply chain.² This is especially important for California's LCFS because fuels using a wide range of feedstocks from across the country and world now target the program's incentives.

Beta commented on several Tier 2 applications for biodiesel fuels produced from tallow and used cooking oil (UCO) that ASTM D6866 should have been conducted. For example, Beta commented on Neste's application <u>No. B0458</u> for renewable diesel (RD) produced from tallow and UCO. Neste's <u>response</u> claimed that these fuels are fully renewable because their tallow and UCO feedstocks are fully renewable, despite deriving energy from their integrated fossil fuel plant. While renewable diesel fuels are drop-in fuels which are not blended during production, they are not necessarily 100% biogenic and should be tested to establish their baseline. Especially given the wide range of feedstocks used to produce RD, including UCO which has been at the center of fraud investigations in the US and EU, these fuels need to be tested to claim biogenic content.

We recommend that CARB review the Netherlands' <u>HVO Regulation</u>, which requires C-14 biogenic content testing for any hydrogenated vegetable oil (HVO) fuels (another term for renewable diesel) claiming renewable content in the country.³ We also recommend reviewing France's <u>Circulaire TIRIB</u> which requires C-14 biogenic testing for any HVO fuels imported into the country.⁴ As member states within the EU bloc, both of these national regulations offer examples of strong approaches to regulating RD from jurisdictions in comparable positions.

Require Biogenic Testing Throughout Biomethane Supply Chains

For § 95488.8 on Fuel Pathway application requirements for all classifications our recommendation is that any biomethane/RNG fuels produced from biogas should be required to submit routine biogenic testing following ASTM D6866. In addition, any book-and-claim accounting system for tracking the environmental attributes of these fuels throughout the supply chain should be required to align any calculations to these biogenic test results. This change would align the program with the best practices

¹ 2020. "Reporting Co-Processing and Renewable Gasoline Emissions Under MRR." California Air Resources Board

²2022. "Clean Fuel Regulations: Quantification Method for Co-Processing in Refineries." Environment and Climate Change Canada

³ 2023. "Do I need to perform a C14 analysis for HVO?" *Dutch Emissions Authority*

⁴ 2020. "Incentive Tax Relating to the Incorporation of Biofuels (TIRIB)." French General Directorate of Customs and Indirect Taxes



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271.1 established by the US Renewable Fuel Standard (RFS), the EU Renewable Energy Directive (RED) and cont.Canada's Clean Fuels Regulation (CFR) for biogenic quantification.

This section specifically addresses the proposed modifications to subsection 95488.8(i)(2), specifically that "staff proposes to allow for book-and-claim accounting of biomethane to produce electricity for electric vehicle charging." This section is also meant to address the proposed modifications to subsection 95488.9(b) where, "staff proposes to add a new temporary CI for low-CI electricity produced by fuel cell from biomethane from dairy and swine manure, based on existing program data." It is critical that projects combusting biomethane to produce electricity be required to conduct biogenic testing to book the correct amount of renewable content. Alternative approaches based on calculations, especially based only on existing program data, consistently overestimate the renewable content of fuels, which would lead to credits being claimed for electricity produced from the fossil-based portion of combusted fuels.

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 <u>Biogas Regulatory Reform Rule</u> (<u>BRRR</u>).⁵ 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. By testing the initial feedstock at the anaerobic digester, the biogas derived fuel at the point of upgrading and the final blended fuel, there is a clear demonstration of biogenic content from the raw biogas from these livestock operations to the final energy product.

The EU introduced biogenic testing requirements for fuels produced from biogas in a June 2023 update to the EU Renewable Energy Directive (RED) titled, <u>"Renewable energy-method for calculating the share of renewables in the case of co-processing.</u>"⁶ 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.⁷ The EU investigation into this issue is still 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 and biomethane into the update in order to address these concerns for any fuels containing a mixture of biogenic and fossil content.

⁵ 2023. "40 CFR Parts 80 and 1090– Renewable Fuel Standard (RFS) Program: Standards for 2023–2025 and Other Changes." EPA

⁶ 2023. "Renewable energy- method for calculating the share of renewables in the case of co-processing." European Commission

⁷ 2023. "ISCC Press Release July 27, 2023." International Sustainability & Carbon Certification



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271.1 The advantage of this framework is that the EU was able to continue to accept calculation based cont.
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.

One other relevant model specifically for biomethane combusted to produce renewable electricity is Canada's Greenhouse Gas Reporting Program (GHGRP), which requires biogenic testing following ASTM D6866, "If combusted fuels or fuel mixtures contain a biomass fraction that is unknown or cannot be documented." The program specifically requires fuel sampling, "Quarterly for renewable and biomass gaseous fuels derived from biomass including landfill gas and biogas from wastewater treatment or agricultural processes."⁸ This is an important model to consider for the proposed modifications to subsection 95488.8(i)(2) and subsection 95488.9(b) because it provides a better approach to measuring the biogenic content of biomethane combustion than making assumptions based on historical program data. Allowing producers to generate credits for electricity produced from biomethane production without routine testing would expose the program to greenwashing and fraud.

The US RFS model of testing at the point of production, at the point of blending with non-renewable components and at the point of injection into a pipeline provides a comprehensive chain of custody for the renewable content in these fuels, making it possible to report and trade only real biogenic content introduced to the grid. Similarly, the EU RED model demonstrates that tying calculation-based accounting approaches to routine direct testing requirements is the most secure way to access the benefits of a book-and-claim system without exposing the program to undue risk. Finally, Canada's GHGRP model provides a successful model of testing at the point of combustion for biomethane intended to produce electricity, without allowing producers to claim credits for more renewable energy than they actually provide. Implementing proper biogenic quantification by requiring routine testing following ASTM D6866 is the most effective way to credit biomethane from production to end use.

Never Rely Exclusively on Mass Balance Calculations

It is critically important that California's LCFS rely on direct testing for biogenic content quantification, 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 as the output. Renewable feedstocks will often have different activity than their fossil counterparts and won't necessarily produce the same quantity of outputs.⁹ By

⁸ 2022. "Canada's Greenhouse Gas Quantification Requirements." Environment and Climate Change Canada

⁹ 2006. "Determining the modern carbon content of biobased products using radiocarbon analysis." *Bioresource Technology*, 97(16), 2084-2090.



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271.1 basing their calculations solely on production inputs rather than outputs these methods systematicallycont. over-report the renewable share of fuels.

This is very important to consider for any program certifying biogas which is upgraded to fuels because biogas is often blended with non-renewable content in the process of biomethane production. If California's LCFS relies exclusively on calculations to quantify biogenic content, producers will be able to intentionally claim credits for fossil content used in these energy products. The only reliable way to attribute credits exclusively to the biogenic content derived from biogas is through routine direct testing at the point of production, the point of blending with non-renewable content, and the point of pipeline injection or combustion.

Calculation-based approaches such as book and claim also allow producers to use a system of free allocation, meaning they do not have to guarantee that there is any renewable content in a given output. Producers prefer this because if 10% of their feedstocks are biogenic they can claim that 10% of their outputs are biogenic, even if that's not the case because biogenic content can go in different amounts to different end products. As a result, book and claim systems allow producers to claim that 10% of their outputs 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).¹⁰ This allows producers to intentionally claim unfounded renewable content in the products which can maximize their incentives, without providing the decarbonization benefits those incentives are meant to promote. In the case of the LCFS, this could mean that producers would be able to claim that 100% of their biomethane fuels are biogenic, even if much of the final fuel contains fossil content, while the remaining biogas is used elsewhere in their operation.

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.¹¹ 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."¹² In response to this situation the EU quickly updated the RED's rules to uniformly require routine direct testing, including for producers choosing to use calculation based approaches to verify their calculations.¹³ We also re-emphasize to CARB that the EU chose to include biogas derived fuels in this update to protect the integrity of calculations used to track biogenic content through biomethane supply chains as well.

Conclusion

¹⁰ 2024. "The Mass Balance Approach." International Sustainability & Carbon Certification

 $^{^{\}rm 11}$ 2023. "ISCC Press Release July 27, 2023." International Sustainability & Carbon Certification

¹² 2023. "ISCC Press Release July 27, 2023." International Sustainability & Carbon Certification

¹³ 2023. "Renewable energy- method for calculating the share of renewables in the case of co-processing." European Commission


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271.1 Routine testing requirements are a critical part of the verification process and should be used to verify the renewable content of biogas upgraded to fuel in the LCFS. Introducing testing requirements for biogas and biogas derived fuels is in line with the treatment of these fuels under the US Renewable Fuel Standard (RFS) and the EU Renewable Energy Directive.¹⁴ Relying on mass or energy balance calculations alone would allow producers to continue to claim credits for fossil derived content in these fuels by allocating renewable content from elsewhere in their operation which never end up in the final energy product. In addition to the benefit of reliable results under the standard, routine testing requirements would ensure consistency across the board for anyone pursuing the Tier 2 Pathway.

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 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 21644. 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 specific international standards based on the use of direct Carbon-14 testing, such as ISO 21644, which is a European standard developed for measuring the biogenic carbon content of waste derived fuels as a fraction of total carbon content.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

¹⁴ 2010. "40 CFR Part 80 Subpart M– Renewable Fuel Standard." National Archives Code of Federal Regulations

¹⁵ 2021. "Standard Test Methods for Determining the Biobased Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis." ASTM International (D6866-21)

¹⁶ 2021. "ISO 21644:2021 Solid recovered fuels: Methods for the determination of biomass content." International Standardization Organization



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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. <u>http://www.biobasedcontent.eu/en/about-us/</u>

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 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.

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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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 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)

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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



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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.

Areas where cross-contamination might occur include but are not limited to; biomedical or nuclear reactors, isotope enrichment / depletion columns, water, soil, plant, or air samples collected near or at biomedical / nuclear reactor sites, medical, industrial, or hazardous waste sites, samples specifically manipulated to study the uptake / fractionation of stable isotopes due to biological or metabolic processes. 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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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 (14C) 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 14C as a tracer because it can easily substitute 12C atoms in the drug molecule, and it is relatively safe to handle. Tracer 14C is a well-known transmittable contaminant to radiocarbon samples, both within the AMS equipment and within the chemistry lab.

Since the artificial 14C 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) 14C samples that are hundreds to tens of thousands of times above the natural 14C levels found in archaeological, geological, and hydrological samples. Because the 14C 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 14C 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) 14C.

- share any laboratory space, equipment, or personnel with anyone preparing (pretreating, combusting, acidifying, or graphitizing) samples that contain Tracer or Labeled (Hot) 14C.

- use AMS Counting Systems (including any and all beam-line components) for the measurement of samples that contain Tracer or Labeled (Hot) 14C.

Tracer-Free Lab Required

Recently, federal contracts are beginning to specify that AMS laboratories must be 14C 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 14C 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 14C 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 14C 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 14C. Accepted requirements are:

(1) disclosure to clients that the laboratory working with their products and materials also works with artificial 14C
(2) chemical laboratories in separate buildings for the handling of artificial 14C 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

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"... 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 14C should not be allowed in a radiocarbon laboratory." "Despite vigorous recent efforts to clean up the room, the "blanks" we measured had 14C contents equivalent to modern or even post -bomb levels."

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"The presence of elevated 14C 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 14C 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."



October 16, 2024

California Air Resources Board 1001 I Street Sacramento, CA 95814

RE: Proposed 2024 Low Carbon Fuel Standard Amendments

Dear Chair Liane Randolph,

On behalf of CarbonCapture Inc., Climeworks Corporation, Heirloom Carbon Technologies and 1PointFive, four leading direct air capture (DAC) companies who plan to develop more projects in California, we extend our appreciation for the opportunity to provide comments on the California Air Resources Board's (CARB) 2024 Proposed Amendments to the Low Carbon Fuel Standard (LCFS). As a group, our four companies are dedicated and fully engaged in the broad deployment of DAC technologies at climate relevant scales.

We commend the Board for its continuing commitment to climate action and leadership in incentivizing the deployment of carbon capture and direct air capture technologies. California's leadership continues to influence other jurisdictions in shaping their climate policies and catalyzing a broader, collective commitment to fostering cleaner, more sustainable energy practices on a global scale.

- 272.1 We would like to reiterate our support for CARB's overall approach providing DAC projects the option of securing low-CI electricity via power purchase agreements (PPAs) as reflected in CARB's proposed revisions to § 95488.8 (Fuel Pathway Application Requirements Applying to All Classifications). DAC is a nascent technology, with substantial investment required to construct first-of-a-kind commercial projects and realize their full potential. Project proponents will need to secure a variety of financing instruments to support DAC and commercial agreements with numerous partners to bring these projects to fruition including PPAs. To avoid creating unnecessary and, in some cases, insurmountable hurdles, the ability of DAC project proponents to utilize PPAs for power supply will prove critical.
- 272.2 We recognize that in proposing offsite power supply CARB must establish a book-and-claim accounting methodology that serves the dual purpose of accounting for the use of low-CI electricity and tracking the associated environmental attributes while also avoiding the risk of resource shuffling or double counting of benefits. We support CARB's efforts to address these dual challenges. We believe that the following criteria will address the need for an accounting methodology and address the resource shuffling risk:

272.2 cont. § 95488.8.(i)(1)(C)1. The low-CI electricity must be supplied to the grid within the local balancing authority where the electricity is consumed or delivered to that local balancing authority without substitution consistent with the requirements of California Public Utilities Code section 399.16, subdivision (b)(1).

- § 95488.8.(i)(1)(C)3. Low-CI electricity must be supplied by new or expanded low-CI electricity that begins new or expanded production on or after January 1, 2022, or within three years of the start of the hydrogen production facility or direct air capture project, whichever is later.
- § 95488.8.(i)(1)(C)5. Any renewable energy certificates or other environmental attributes associated with the energy are not issued credits or claimed produced, or are retired and not claimed under any other voluntary or mandatory program with the exception of the federal RFS, incentives under the Infrastructure Investments and Jobs Act or the Inflation Reduction Act, 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).

These three criteria will ensure that the low-CI electricity required by a DAC project will not result in a paper exercise that shuffles high-CI electricity to other users while dedicating low-CI to DAC projects, ensures that low-CI electricity secured by PPAs is additional to what is currently available on the grid, and that the REC or other environmental attributes are not double counted.

272.3 However, we must again highlight the barriers presented by the following proposed criteria:

§ 95488.8.(i)(1)(C)2. The pathway holder or the project operator must be the first contracted entity for procuring the low-CI electricity.

§ 95488.8.(i)(1)(C)4. 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 must be claimed for LCFS reporting no later than the end of the third calendar quarter. After that period is over, any unmatched low-CI electricity quantities expire for the purposes of LCFS reporting.

- 272.3 cont. The requirement that the pathway holder or project operator be the first contracted entity for procuring low-CI electricity could present serious problems for this nascent industry which, due to the entrepreneurial nature and limited resources of the project companies, may necessitate the use of their parent companies or affiliates to execute power procurement contracts or other supply arrangements. We do understand that CARB may be intending to prevent the doublecounting of low-CI power procured and, if so, we respectfully recommend that the criteria be changed to require the pathway holder (not necessarily the contracting entity) to be the only entity that can claim the electricity and associated environmental attributes from the low-CI project, and such claim must be auditable and verifiable by CARB. It may be that this is already CARB's intent, i.e., CARB is already familiar with and understands that project such as DAC projects may involve several affiliated entities. Consequently, as interpreted by CARB and as applied in practice, CARB will recognize that the parent company or affiliates of a pathway holder or project operator could be the first contracting entity for procuring low-CI electricity as demonstrated by any number of corporate instruments or captive agreements. If this is the case, we respectfully request that CARB clarify this in its response to comments and in later guidance.
 - 272.4 The requirement that book-and-claim accounting for low-CI electricity may span only three quarters also presents a significant barrier to DAC deployment today. We propose that CARB revise this proposed language to allow DAC projects to book-and-claim claim credits on an annual basis. We believe that this is necessary for climate relevant scale DAC projects given the current constraints in low-CI electricity supply and temporal attribute market systems.
 - The first challenge is technological: Intermittent seasonal renewable electricity is the lowest cost and most available low-CI electricity source for DAC projects today that can be developed on timelines compatible with DAC project development. The technology for supplying continuous 24/7 low-CI electricity at the scale and duration needed for DAC is not yet readily available, and the market systems for tracking and trading the necessary low-CI power attributes at sub-annual time resolution do not currently exist. Pairing seasonal and intermittent renewable electricity with long term energy storage technology is simply not achievable today at the scale needed to support DAC projects with electricity supply balancing over three-quarterly periods. The majority of the existing battery energy storage systems that have been deployed in the US only have a 1-4 hour duration, and only represent a small portion of the available capacity of the grids where they are installed, making it infeasible to firm-up intermittent resources for prolonged periods. Furthermore, in order to maximize the amount of carbon removed, DAC

- 272.4 cont. technologies should not be cycled in response to the seasonality of renewable resources, and instead should operate at maximum capacity year-round to optimize efficiencies and maximize climate benefits. Annual matching, in conjunction with the locational and additionality requirements, accomplishes CARB's goal of ensuring that enough new low-CI generation is installed in the grid where the project will operate, while allowing DACs to operate at full capacity year-round without the burden of having to over-build or over-procure, which negatively impacts project economics, decreases efficiency for the overall market, and ultimately hinders the ability to rapidly deploy this necessary technology.
 - The second challenge is market systems availability: the tracking, trading, and usage systems supporting energy attributes (e.g., RECs) currently only allow for annual granularity; systems capable of handling higher granularity are projected to take years to put into place (with a few very limited exceptions like PJM and M-RETS). Moreover, the mere availability of tracking systems to handle higher granularity is not sufficient; robust liquid markets for more granular energy attributes will be needed to achieve acceptable supply and pricing risk for project finance. In the interim, there is no ability for a project to be able to cover this risk other than significantly over contracting/installing new renewable electricity generation.
 - The third challenge is economics and financeability: The additional economic burden and financial risk required to comply with the first two challenges is significant and risks stifling this nascent industry. The three-quarterly book-and-claim matching period is not aligned with the full annual seasonal cycle of output from intermittent renewable electricity sources. Each subsequent three-quarterly period will cover a different part of the seasonal cycle to the previous and subsequent three-quarterly periods, making it very difficult to commit to long-term power procurement contracts with confidence that supply will be sufficient in each subsequent three-quarter period. However, signing longterm power procurement contracts is necessary in order to bring new additional power sources online that meet the additionality requirement. The only way a DAC project can cover the low-CI electricity supply risk is by significantly over-contracting for new renewable electricity capacity, which will introduce substantial additional cost and untenable financial risks associated with selling excess contracted generation to the market at times of high renewable output that are likely correlated with low prices. The additional cost and financial risk created by sub-annual matching requirements would be a severe barrier for DAC deployment, particularly given the context that DAC

272.4 cont. technologies are nascent, these will be first-of-a-kind commercial projects with inherent technology and market risk, and many DAC developers are early-stage companies without deep financial resources. This combination of factors creates extreme project financial risk that will limit investment in DAC deployment.

We strongly recommend that CARB revise § 95488.8.(i)(1)(C)4 as follows:

"Such book-and-claim accounting for low-CI electricity may span only three four 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 must be claimed for LCFS reporting no later than the end of the third fourth calendar quarter. After that period is over, any unmatched low-CI electricity quantities expire for the purposes of LCFS reporting."

We believe that at this nascent stage of both DAC technology deployment and availability of continuous 24/7 low-CI electricity, an annual book-and-claim matching period for DAC under LCFS is appropriate. This would account for the full annual seasonal cycle for intermittent renewables. Matching periods shorter than 12 months will significantly impact the financeability of early DAC projects and impede deployment of this critical climate technology that is likely to be vital to meet the State's 2045 net-zero goal.

272.5 We would like CARB to confirm our understanding of the proposed book-and-claim balancing provisions as applying on a rolling quarterly basis, i.e., that if a low-CI electricity quantity is supplied to the grid in a calendar quarter, the quantity must be claimed for LCFS purposes no later than the end of the third calendar quarter following the beginning of such quarter. This is the only logical reading because it would permit low-CI electricity supplied to the grid when solar or wind generation peaks to be balanced sometime during the following three quarters on a rolling basis. We strongly recommend that CARB confirm this understanding in its response to comments and also commit to issuing guidance for the use of book-and-claim accounting by DAC projects that confirm this understanding (the current Low Carbon Fuel Standard (LCFS) Guidance 19-01 Book-and-Claim Accounting for Low-CI Electricity is not as clear as it could be).

We do expect that the analytical understanding of the emissions and financial implications of different book-and-claim matching periods, as well as the ability to achieve shorter matching periods, will improve as energy storage technology and the market systems needed to support temporal matching are advanced. Imposition of sub-annual temporal matching criteria can be contemplated at such time when it is practically and technologically feasible if there is strong justification that such requirements are necessary. Again, our group of companies support the LCFS and the critical role it continues to play in advancing the deployment of clean technologies to address our current climate crisis (and as a courtesy, we include copies of our earlier submitted comments with this letter). We believe that California has the opportunity to set the bar for rigorous policy design that accelerates DAC technology deployment, unlocking investment and job opportunities in California and the United States.

Regards, CarbonCapture, Inc. Climeworks Corporation Heirloom Carbon Technologies 1PointFive

nature energy

Article

The influence of additionality and time-matching requirements on the emissions from grid-connected hydrogen production

Received: 18 April 2023

Accepted: 11 December 2023

Published online: 8 January 2024

Check for updates

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The literature provides conflicting guidance about the appropriate time-matching requirement between electricity consumption by electrolysers and contracted variable renewable energy (VRE) for qualifying hydrogen (H₂) as 'low carbon'. Here we show that these findings are highly influenced by different interpretations of additionality. Substantially lower consequential emissions are achievable under annual time matching when presuming that VRE for non-H₂ electricity demand does not compete with VRE contracted for H₂, as opposed to when assuming that all VRE resources are in direct competition. Further analysis considering four energy system-relevant policies suggests that the latter interpretation of additionality is likely to overestimate the emissions impacts of annual matching and underestimate those of hourly matching. We argue for starting with annual time matching in the near term for the attribution of the H₂US production tax credits, where conditions resemble the 'non-compete' framework, followed by phase-in and subsequent phase-out of hourly time-matching requirements as the grid is deeply decarbonized.

Policies aimed at economy-wide decarbonization, such as the Inflation Reduction Act (IRA) in the United States, emphasize electrifying end uses while decarbonizing the growing electric power supply. In that context, an important question arises: what are the carbon dioxide (CO₂) emissions induced by specific loads (existing or new) connected to the grid that also contractually procure electricity from specific, often low-carbon, resources? This question is especially relevant for hydrogen (H₂) production via grid-connected electrolysers, which is receiving increased policy attention—for instance, the IRA provides production tax credits (PTC) for 'low-carbon' H₂ that are tied to specific emissions thresholds, reaching a maximum of US\$3 per kg of H₂¹. Simply using grid-connected electricity to power electrolysers, even in relatively high variable renewable energy (VRE) grids in the United States in 2021, such as California's, would result in greater emissions than H_2 produced from natural gas (NG) steam methane reforming (SMR) without carbon capture and storage (CCS)².

Modelling the emissions induced by a specific grid-connected load that contracts with a specific grid-connected generation resource is complex because instantaneous power flows from a particular producer cannot be directly associated with a particular user. However, modelling exercises to characterize emissions impacts of individual loads, as performed in this paper, are critical for informing the policymaking process. They guide policymakers to draft qualifying requirements that third parties (for example, a H_2 producer or a corporation) need to fulfil for their activities or products to be 'certified' as low carbon and to reap financial and/or reputational benefits. Consequently, these qualifying requirements have billion-dollar ramifications as they will directly impact investments in the energy sector.

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Fig. 1 | **Modelling emissions and cost impacts of additionality.** Approaches for evaluating the cost and consequential emissions impact of electrolytic H₂ production based on the two alternative definitions of additionality. **a**, The 'compete' definition (purple dotted box) mirrors the approach of Ricks et al.³ and allows for competition among investment in resources contracted for H₂ production and other grid resource investments. **b**, The 'non-compete' definition of additionality (yellow dotted box) follows the approach of Zeyen et al.⁴ where

This Article's contribution to the field of electricity emissions accounting is grounded in an analysis of the H₂ PTC, which has spurred a vigorous debate in the academic and policy spheres. The debate has largely focused on qualifying time-matching requirements for low-carbon, grid-connected H₂ production, with recent research papers by Ricks et al.³ and Zeven et al.⁴ supporting different requirements. The time-matching requirement defines the timescale over which the volume of contracted low-carbon electricity generation (in MWh) needs to equal the volume of electricity consumed for H₂ production (for example, hourly, annual or other). Zeyen et al. find that annual matching generally leads to limited associated emissions, whereas hourly matching typically raises the cost of H₂ production compared with annual matching. In contrast, Ricks et al. find that under annual matching, the emissions associated with the H_2 production are substantially higher than acceptable thresholds and hourly matching is needed. These two conflicting results present a conundrum for policymakers tasked with making imminent decisions about how to implement H₂ PTC policies.

Besides temporal matching, a second important qualifying requirement is additionality. The additionality requirement establishes a causal relationship between the procured low-electricity generation and H_2 production—a truly additional generation resource is one that would not have been built had the load that contracts its electricity not been built. The aim of an additionality requirement is to avoid double-counting low-carbon electricity deployed for other objectives (for example, grid decarbonization). A third key qualifying requirement is spatial matching, that is, the extent to which the electrical path between the procured low-carbon electricity supply and the electrolyser is physically congested over the lifetime of the supply contract.

Here we use an open-source energy system model⁵ to quantify the interaction of alternative interpretations of the additionality (which we label 'compete' and 'non-compete') and time-matching requirements (annual and hourly) in terms of consequential emissions and the levelized cost of electrolytic H₂ production (LCOH). We find that the emissions impact of a time-matching requirement is conditional upon the applied additionality modelling framework, and this observation partly explains the divergent findings of the above-mentioned papers. Furthermore, through modelling of different contextual policies, we demonstrate that the standard 'compete' additionality framework in many contexts is likely to overestimate of the emissions impact of annual matching and/or underestimate those for hourly matching. In general, this study highlights that one cannot generalize emissions impacts of a selected time-matching requirement in isolation from how other qualification requirements are defined and other existing energy system-related policies that are in place.

satisfy the specified time-matching requirement. Note that the baseline grid in both additionality frameworks is the same, whereas the optimized grid with H₂

resources is different (as indicated by the different colours of the circles).

Modelling additionality and relevant energy policies

At one extreme, any generation resource that is not operating in the system before installation of the electrolyser can be considered 'additional'. This additionality definition, used in ref. 3, can be modelled via two parallel runs with cost-optimal brownfield grid expansion under the same set of assumptions, including 'initial grid' conditions (Fig. 1a). The only difference between both runs is that one run excludes H_2 load ('baseline grid') whereas the other includes H_2 load that is constrained to meet certain temporal and/or spatial matching requirements ('counterfactual grid'). The consequential emissions from electrolytic H_2 production can be calculated as the difference in emissions between both grids. Under this modelling framework,

Table 1 | Summary of the four policy scenarios evaluated to quantify their impact on emissions and cost associated with alternative time-matching and additionality requirements related to electrolytic H_2 production

	Standard case	Policy scenario	
Limiting the electrolyser's annual capacity factor	Baseload and unconstrained flexible operation	Range of maximum annual capacity factors (20–80%)	
Minimum annual VRE generation requirement, RPS	None	60 and 80% VRE target for non- H_2 electricity demand (Supplementary Methods equation (6))	
VRE + battery storage capacity buildout limit	Unconstrained	15 GW (Supplementary Methods equation (7))	
Use of NG-based H ₂ to meet H ₂ demand	Only electrolytic H ₂	$\begin{array}{c} Competition \mbox{ for } H_2 \\ production \mbox{ between} \\ electrolysis \mbox{ and } NG\mbox{-based } H_2 \\ with \mbox{ CCS} \end{array}$	

in the counterfactual grid, the more low-carbon resources that are built out to satisfy H_2 demand, the fewer low-carbon resources might be built out merely because of their cost effectiveness (due to the self-cannibalization effect of renewables). In that sense, H_2 demand 'competes' with the decarbonization of other electrifying sectors without strict matching requirements (for example, transport or heating).

At the other extreme, only generation resources that would not have been deployed in the absence of electricity demand for H₂ production can be considered additional. This additionality definition, applied in ref. 4, involves evaluating model outcomes in series rather than in parallel (Fig. 1b). First, we solve the cost-optimal grid brownfield expansion excluding H₂ load to yield the 'baseline grid'. Subsequently, the counterfactual grid is obtained by running the cost-effective grid expansion to satisfy H₂ demand with the expanded baseline grid as a starting point. As H₂ demand for low-carbon resources is only satisfied after low-carbon resource needs for non-H2 demand or any other decarbonization policy is fulfilled, H₂ load does not compete with other drivers for investment in low-carbon electricity. This so-called 'non-compete' framework implies a stricter definition for additionality, whereas the additionality definition according to the 'compete' framework is easier to enforce in practice (Supplementary Note 1 provides further details).

Besides analysing alternative additionality frameworks, we also evaluate the impact of four policies on the system impacts of time-matching requirements under the 'compete' additionality framework, where such policy interactions are relevant (Table 1). The first policy constrains the maximum annual capacity factor of the electrolyser so as to incentivize a producer meeting a fixed H₂ demand under annual time matching to forgo production during periods of high electricity prices. This policy would also reduce emissions impact of H₂ production in a fossil-fuel-dominant power system, where periods of high electricity prices are correlated with periods of high marginal grid emissions intensity.

Second, to analyse the impact of the initial grid on the emissions and LCOH of alternative qualifying requirements, we evaluate scenarios where we impose minimum annual VRE generation requirements (60%and 80% of the non-H₂ electricity demand). Such an annual VRE generation requirement can be realized by two approaches in isolation or in combination: via renewable portfolio standard (RPS) policies⁶, as is in place in 29 US states as of June 2023⁷ or via decentralized procurement of VRE supply by several end-use customers, for example, by the numerous pledges of corporates to become climate neutral⁸. When including a minimum VRE requirement under the 'compete' framework, VRE for non- $\rm H_2$ load is prioritized. This prioritization, by definition, is inherent in the 'non-compete' framework.

Third, many grids are facing substantial delays in connecting new generation to the transmission grid^{9,10}, which was not considered in prior studies. We model this policy failure by adding a constraint that limits the capacity of VRE and battery storage that can be built out (Methods).

Fourth, whereas most studies on qualifying requirements focus exclusively on electrolytic H_2 , other H_2 pathways like NG-based H_2 production with CCS (so-called blue H_2) are also receiving policy support. To understand how qualifying requirements impact competition between green and blue H_2 , we evaluate scenarios with the option to also invest in blue H_2 .

Impact of different interpretations of additionality

Figure 2 shows that the contracted resource mix for H_2 production under annual time-matching requirements is more sensitive to the additionality definition than under hourly requirements. In general, wind plays a greater role under an hourly time-matching requirement than under an annual requirement for both additionality frameworks in the Electric Reliability Council of Texas (ERCOT) case study. Under the 'compete' framework, solar generation is preferred to meet annual time-matching requirements, whereas under the 'non-compete' framework, wind generation plays a greater role to meet the contractual requirement. This is a consequence of which generation resources are built out in the baseline grid expansion. Because baseline grid expansion in the ERCOT case study solely results in solar additions (Supplementary Fig. 4), use of solar to serve H_2 load under the 'non-compete' framework has diminished economic value as compared with the 'compete' framework.

Compared with annual time matching, hourly time matching leads to higher capacities of contracted resources for H₂ production under both additionality modelling frameworks. Consequently, hourly matching generally leads to reductions in carbon-based generation, especially NG, compared with the baseline grid scenario for both ERCOT (Fig. 2c,d) and the grid managed by the Florida Reliability Coordinating Council (FRCC) (Supplementary Fig. 19). The increased capacity deployment is necessary to ensure that the VRE generation plus net discharge of battery storage from contracted resources is at least equal to hourly electrolyser power consumption (Supplementary Methods equation (3)). Extensive deployment also implies that these contracted resources will generate in excess of electrolyser power demand at certain times. As such, more expensive generation on the margin is displaced (Extended Data Fig. 1a,b). The displaced generation includes VRE resources that would have been deployed in the baseline grid and NG and, to a limited extent, coal generation. Hourly time matching generally leads to low or negative emissions under both additionality modelling frameworks. In the 'compete' framework, competition with non-contracted grid resources results in less negative, or even positive, consequential emissions (Fig. 3).

In the annual time-matching cases and the 'compete' framework, additional gas generation is needed to meet electricity demand for H_2 production during times of low solar availability (Extended Data Fig. 1c). In contrast, under the 'non-compete' framework, increases in gas generation during low VRE availability hours are largely offset by decreases in gas and coal generation during hours with high solar availability (Extended Data Fig. 1d). This is explained by more VRE investment for non- H_2 electricity demand under the 'non-compete' framework, which is the main driver of the diverging consequential emissions under annual matching when comparing both additionality frameworks (Fig. 3). In the 'compete' framework and annual time matching, the emissions under baseload operation are greater than the emissions of H_2 production from NG without CCS^{II}. Flexible operation



Fig. 2 | **Power sector resource changes due to H**₂ **production. a**-**d**, Change in power generation and storage capacity (**a**,**b**) and annual power generation (**c**,**d**) resulting from electrolytic H₂ production under alternative H₂ demand scenarios, time-matching requirements and additionality frameworks. Results correspond

to the case study based on the grid managed by ERCOT and are reported relative to the baseline scenario involving grid resource expansion without any H_2 demand. Power purchase agreement (PPA) refers to resources added specifically to meet time-matching requirements for H_2 production.

slightly mitigates this effect by limiting NG generation versus the baseline grid.

Flexible electrolyser operation results in lower capacity deployment for both annual and hourly time-matching requirements under both additionality modelling frameworks (Fig. 2). This is because flexible operation enables the shifting of electricity consumption for H₂ production to better match the availability of contracted VRE resources, whereas relying on relatively low-cost H₂ storage (Supplementary Table 2) to meet H₂ demand. It also avoids the need for expensive battery storage deployment to meet hourly time-matching requirements, instead deploying H₂ storage capacity (Supplementary Figs. 7 and 8). As a consequence, under flexible operation, the volume of excess electricity sales reduces (Supplementary Figs. 5 and 6), and less negative consequential emissions are observed with hourly time matching (Fig. 3). Interestingly, in the 1 GW H₂ demand scenario with hourly time matching under the 'compete' framework, the combined effect of flexible operation and competition with other grid resources results in positive consequential emissions in both ERCOT (Fig. 3) and FRCC (Supplementary Fig. 24). This is due to a greater reliance on solar compared with the corresponding baseload operation scenario and the lack of any contracted battery storage that results in greater reliance on NG to meet net load requirements (Supplementary Figs. 5 and 6). Higher H₂ demand levels result in wind accounting for a greater share of contracted VRE capacity towards H₂ production, which decreases consequential emissions intensity.

In nearly all cases for ERCOT (and FRCC; Supplementary Fig. 25), the LCOH is greater under hourly versus annual time-matching requirements when disregarding the attribution of a PTC (Fig. 4). Under the hourly time-matching requirement with baseload electrolyser operation, the LCOH after including the PTC remains greater than US\$1 kg⁻¹ in all cases and thus not competitive with NG H₂ without CCS¹¹. Flexible electrolyser operation reduces the LCOH compared with the corresponding baseload operation scenario when disregarding the PTC (Fig. 4), most notably under an hourly time-matching requirement. This is because the reduction in contracted power sector resources more than offsets increases in the fixed cost of the electrolyser and H₂ storage. This result reaffirms other studies that note the importance of electrolyser flexibility to minimize the cost of H₂ production and support grid decarbonization efforts¹².

LCOH without PTC attribution is generally greater under the 'non-compete' framework than the 'compete' framework. This is because the value of excess electricity sales, defined as the difference between absolute value of elec-sales and elec-purchases in Fig. 4, is generally smaller in the 'non-compete' versus 'compete' framework (Supplementary Tables 7 and 8). This is due to two effects. First, in the 'compete' framework, H₂ is inherently prioritized and contracts the most valuable VRE portfolio relative to resources built out for non-H₂ load. Second, wholesale electricity prices under the 'non-compete' framework are more depressed due to greater amounts of VRE generation in the baseline grid. However, when attributing the PTC that corresponds to the consequential emissions found in our modelling, the 'non-compete' cases generally have much lower LCOH than the 'compete' cases, especially under annual time matching.



Fig. 3 | **Emissions impacts under alternative additionality frameworks.** Consequential emissions intensity of H₂ production for alternative H₂ demand scenarios, electrolyser operation modes and time-matching requirements under the 'compete' (**a**) and 'non-compete' (**b**) frameworks of additionality. Results correspond to the ERCOT case study and are reported relative to the baseline grid. Also shown are threshold emissions intensity values for the $\rm H_2$ PTC in the IRA. $\rm H_2$ that meets the Tier 1 limit is eligible for a credit of US\$3 kg⁻¹, whereas $\rm H_2$ that meets the Tier 2 or Tier 4 limits are eligible for credits of US\$1.0 kg⁻¹ and US\$0.6 kg⁻¹, respectively.



Fig. 4 | **LCOH impacts under alternative additionality frameworks. a,b**, Levelized cost of H₂ (LCOH) for the ERCOT case study under scenario with different H₂ demands, time-matching requirements, additionality frameworks and electrolyser operation modes. Levelized cost calculated per description provided in Methods. Elec-sales, revenues earned from selling excess electricity to the grid using contracted power sector resources; elec-purchases, cost of grid electricity purchased to operate the electrolyser; electrolyser-fixed cost, annualized capital and fixed operating and maintenance (FOM) cost of the electrolyser; elec-fixed cost, annualized capital and FOM cost of contracted power sector resources, after accounting for investment tax credit (30%); H_2 storage, capital and FOM cost of gaseous H_2 storage system, which includes the capital cost of the compressor and tank. The total cost with PTC shows the LCOH after accounting for PTC based on consequential emissions for each case.

Impact of relevant energy policies

To assess the robustness of the results, we present the results of two relevant energy-policy scenarios: a minimum annual VRE requirement (for example, a RPS) and the lack of an adequate interconnection policy for VRE deployment. In Supplementary Notes 2 and 3, we present the results of the two other scenarios: competition with blue H_2

(Supplementary Fig. 28) and an operating constraint on electrolysers (Supplementary Fig. 29).

Figure 5 highlights the emissions and cost impact of an annual VRE requirement in serving non- H_2 load that is above the optimal level (vis-à-vis the objective function). This policy scenario is most relevant under annual time matching and the 'compete' additionality framework



Fig. 5 | Emissions and cost under binding renewable electricity targets. **a**,**b**, Consequential emissions intensity of H_2 production (**a**) and levelized cost of H_2 with and without the PTC (**b**) under VRE requirements (no RPS, 60% RPS and 80% RPS) for scenarios with different H_2 demand levels, timematching requirements and electrolyser operation modes under the 'compete'

because of the high consequential emissions intensity of H_2 production in our earlier results (Fig. 3).

The key finding (Fig. 5a) is that enforcing a minimum VRE requirement of 60% under the 'compete' framework is sufficient to reduce the consequential emissions associated with both annual and hourly time matching below the most stringent PTC threshold, when flexible operation is considered. In short, the consequential emissions under the 'compete' framework with the RPS mirror those under the 'non-compete' framework without RPS (Fig. 3). This is because the RPS effectively reduces competition between the VREs built for non-H₂load and those contracted for H₂ production, thereby making the latter 'strictly additional'.

Under an hourly time-matching requirement, a RPS of 80% results in less negative consequential emissions than the 60% RPS due to the declining value of excess electricity sales from the VRE resources available for H_2 production. Moreover, under an 80% RPS, the emissions intensity associated with H_2 production under hourly or annual time-matching requirements becomes relatively similar. This finding suggests that in very high VRE grids, at least with regards to consequential emissions, the choice of an hourly or annual time-matching requirement has limited impact.

Figure 5b shows that a RPS increases LCOH, not accounting for PTC attribution, similarly to the trend seen under the 'non-compete' framework as compared with the 'compete' framework in Fig. 4. The competition between VRE deployments for H₂ production and the RPS results in a lower value of electricity sales to the grid and thus a higher LCOH. The impact is smaller for hourly matching, which may be due to the increased availability of energy storage (Supplementary Fig. 14) that enables electrolysers to reduce their electricity purchase costs. Nevertheless, the relatively larger LCOH increases for annual time matching with a RPS policy are more than offset by the eligible PTC under this scenario.

The next scenario, with a limit on the buildout of VRE and battery storage representing interconnection challenges, will lead to equal or lower-than-cost-optimal VRE capacity levels. Figure 6 highlights that this effect is most impactful under hourly time matching under which higher VRE capacity is deployed to serve H₂ load. Such a buildout limit results in substantially greater consequential emissions associated with hourly matching under the 'compete' additionality



additionality framework. Results correspond to the ERCOT case study. For the levelized cost of H₂, the awarded PTC subsidy is based on the consequential emissions intensity of H₂ for each scenario. Additional results for the annual VRE requirement scenarios are reported in Supplementary Figs. 12–14.

framework (Fig. 6a). For 5 GW H₂ demand, a 15 GW deployment limit causes emissions to rise from being negative to being greater than 6 tonnes CO_2 -equivalent tonne⁻¹H₂, exceeding the least-stringent PTC threshold. This occurs because overbuilding VRE capacity relative to electrolyser demand is not feasible under the buildout limit, which increases fossil fuel generation as compared with the baseline grid case (Fig. 6d).

The LCOH without PTC attribution does not change substantially due to the VRE plus storage buildout limit (Fig. 6b). The portfolio of VRE contracted with H_2 demand now favours relatively more wind over solar (Fig. 6c), which improves VRE capacity utilization and results in lower electricity-related fixed costs (Fig. 6b). In addition, to further improve capacity utilization and minimize VRE curtailment, the capacity of electrolyser and H_2 storage are increased (Fig. 6b), which raises their fixed costs and offsets the reduction in electricity sector fixed costs. Because consequential emissions intensity increases, substantially higher LCOH is seen when considering the PTC attribution.

Implementation of the buildout limit with the same H_2 demand is not feasible under the 'non-compete' framework. The H_2 demand cannot be fulfilled anymore because a large share of the grid-connected capacity has been utilized by VRE built out in the baseline run to cost optimally serve non- H_2 load. Thus, a possible implication of VRE and storage deployment constraints under an hourly time-matching requirement is fewer deployments of electrolyser projects in favour of other low-carbon H_2 production technologies.

Policy interpretation

Two key results summarize our findings from the standard cases (Figs. 2–4) across the two considered regions (ERCOT and FRCC). First, the consequential emissions of electrolytic H_2 are conditional upon how the additionality requirement is modelled. Under the 'compete' framework, an hourly time-matching requirement is the only way to reach consequential emissions that are under the threshold needed to receive the highest PTC. In contrast, under the 'non-compete' framework, an annual time-matching requirement is sufficient in all cases to meet the threshold needed to receive the highest PTC (US\$3 kg⁻¹). The second key result is that independent of the additionality modelling framework, hourly time-matching requirements lead to a higher LCOH relative to annual requirements, excluding

2

50

H₂ sto

75

Biomass Coal Gas Hydro Nuclear Solar Solar–PPA Wind

Wind-PPA

' H.)



Fig. 6 | Impact of renewables plus storage capacity deployment limits. $\mathbf{a}-\mathbf{d}$, Consequential emissions intensity of H₂ production (\mathbf{a}), levelized cost of $H_2(\mathbf{b})$, power system capacity change (\mathbf{c}) and power system generation change (d) under an hourly time-matching requirement with 5 GW of hydrogen demand and flexible electrolyser operation with unconstrained VRE plus storage capacity deployment and a 15 GW limit under the 'compete' modelling framework. Note that 15 GW VRE plus storage deployment limit is not binding

for the 1 GW electrolyser demand. Results correspond to the ERCOT case study and are reported relative to the baseline grid involving grid resource expansion without any H₂ demand. See the caption of Fig. 3 for details on the consequential emissions subplot (a) and the caption of Fig. 4 for details on the LCOH subplot (b). Additional results for the VRE deployment scenarios are reported in Supplementary Figs. 17 and 18. An explanation for the 15 GW VRE and storage limit is provided in Methods. max cap, maximum capacity limit.

the attribution of a PTC, but this disparity can be largely reduced via flexible electrolyser operation. Considering both electrolyser operation modes, we find that the increase in LCOH from annual to hourly is US\$0.25-\$2.49 kg⁻¹, which is a greater range than the US\$0-1 kg⁻¹ increase between hourly time-matching and no time-matching requirements reported by ref. 3 (Supplementary Note 4 provides an overview of all results).

Further, we investigated how four policy scenarios impact our results, with a focus on the results in the 'compete' additionality framework where the impacts of time-matching requirements are the most striking.

In the first two policy scenarios in Table 2, the consequential emissions under annual matching are reduced relative to the standard case. In the other two policy scenarios, the consequential emissions under hourly time-matching increase relative to the standard case in some implementations. In summary, the results of these policy scenarios show that the standard runs under the 'compete' additionality framework in many contexts may in practice overestimate emissions for annual matching and underestimate emissions for hourly matching. These results also suggest that the difference in the LCOH under annual and hourly matching will probably be smaller relative to the standard case (Table 2).

Our results provide robust evidence for our original thesis: one cannot generalize emissions impacts of a specific time-matching requirement in isolation from how other qualification requirements are defined and other existing policies. However, it leaves open an important question for policymakers: which time-matching requirement is the most appropriate to consider when determining eligibility for the PTC in the United States?

It can be argued that the near-term context, in which the relative demand for renewable electricity for electrolytic H₂ is small compared with the total additions of VREs, more closely resembles the 'non-compete' additionality framework; we expect substantial non-H₂

load related VREs to enter before seeing high volumes of electrolytic H₂. As of May 2023, installed electrolyser capacity in the United States amounted to 67 MW (579 MW under construction)¹³, implying that 1 GW and 5 GW electricity-equivalent H₂ demand would represent roughly a 2× and 10× installed and under-construction capacity. Moreover, in the near term, demand for green H₂ is likely to originate from sectors where H₂ is already used today (for example, ammonia production) and thus be relatively small compared with the scale of electricity demand. For example, if 10% of US H₂ consumption in 2021 (around 1 MT per vear) were to immediately shift to consume electrolytic H₂, it would amount to around ~1% of US electricity consumption as of 2021. At the same time. VRE deployments on the grid are likely to grow rapidly in the near term, as evident from their dominance in the existing interconnection queue in many US regions⁹ and due to dedicated VRE incentives, for example, PTCs or investment tax credits in the IRA, state RPSs⁷ and corporate procurements8.

The above interpretation would imply that less stringent annual time-matching requirements may be reasonable in the near term to ensure minimal consequential emissions (Fig. 3) while leading to lower LCOH outcomes (Fig. 4). Requiring hourly time matching in this decade may work against the policy objectives of the PTC to scale green H₂ production. While hourly time matching with flexible operation can also achieve low consequential emissions and LCOH outcomes under the 'non-compete' framework, its implementation would require much larger land area, onsite H₂ storage and capital investments than under annual time matching that may serve as additional barriers. In the case that electrolytic H₂ would manage to secure the scarcely available connection capacity, we have shown that the consequential emissions of H₂ production under hourly matching can greatly exceed the lowest PTC tier (Fig. 6). In addition, under hourly matching, the likelihood of substitution of green H₂ with blue H₂ is higher than under annual matching, again leading to potentially increased overall system wide (Supplementary Fig. 28).

Table 2 | Summary of results of the four policy scenarios relative to the results under the standard 'compete' additionality framework

	Time-matching requirement	Consequential emissions	LCOH
Limiting annual electrolyser capacity factor		Decrease	Increase
Minimum annual VRE generation requirement, RPS	Annual matching	Substantial decrease across all cases	Increase under annual requirements
VRE + battery storage capacity buildout limit		Substantial increase when limit is binding	Negligible impact
Use of SMR-CCS to meet H ₂ demand	Hourly matching	Increase under hourly requirements with baseload operation; flexible operation cases unchanged	Decrease under hourly requirements with baseload operation; flexible operation cases unchanged

In contrast, in the near term, lower implementation barriers and electrolyser H₂ sales prices under annual matching would encourage the deployment of electrolysers, allowing for technology scale-up and associated reductions in capital costs. Realizing low prices for green H₂ would support long-term economy-wide decarbonization goals by potentially displacing fossil-fuel-based H₂ in industrial applications and stimulating new demand for H₂ in end uses that are currently dominated by fossil fuels (for example, heavy-duty transport). In the case of the new H₂ demand, additional investments will be needed to facilitate H₂ use (for example, refuelling infrastructure, new equipment), and having cheap H₂ in the short-term incentivizes its use. To mitigate risk of competition for VREs during peak periods, the introduction of an annual capacity factor limit for the electrolyser can be a pragmatic policy to complement annual time-matching requirements. Slight decreases in the capacity factor (for example, capacity factor $\leq 80\%$) lead to important decreases in emissions at the expense of only a limited increase in the LCOH (Supplementary Fig. 29).

However, as demand for green H_2 grows, it is likely that the magnitude of VRE resources contracted for H_2 production will grow and increasingly compete with VRE resources that would be deployed for other reasons. In this case, the 'compete' framework for additionality is more suitable to evaluate the consequential emissions impact of H_2 production. Therefore, in the medium term (from 2030 onwards), shifting to hourly time-matching requirements may be necessary to avoid the risk of high consequential emissions impacts. Moreover, a phased approach for implementing more stringent hourly time matching may also benefit from capital cost declines for power sector resources (VRE, battery storage) and electrolysers that would make the LCOH outcomes for hourly time matching more compelling than values estimated here.

Finally, in the longer run, when grids are highly decarbonized (for example, over 60% of non- H_2 load covered by low-carbon generation including VREs, nuclear, hydro), an hourly time-matching requirement may no longer be necessary. Annual matching under flexible operation can achieve negative consequential emissions and similar LCOH outcomes as hourly time matching, without incurring additional VRE and storage investment (Fig. 6). Collectively, these factors indicate that a phased approach on defining the qualifying requirements for the H_2 PTC may be the most pragmatic approach to minimize barriers to grid

Conclusions

Our systematic analysis of time-matching and additionality requirements in the context of electrolytic H₂ production highlights that one cannot generalize emissions impacts of a particular time-matching requirement in isolation from how other qualification requirements are defined and what other regionally differentiated energy policies are in place. Through two case studies, the ERCOT and FRCC grids, we confirm that the consequential emissions from producing electrolytic H₂ are conditional upon how the additionality requirement is modelled. Furthermore, an analysis of critical policy scenarios shows that the standard runs (that is, with these policies) under the 'compete' additionality framework are likely to overestimate consequential emissions for annual matching and/or underestimate them for hourly matching. These results give policymakers insight into the effectiveness of time-matching requirements in limiting consequential emissions in different regional contexts. Finally, our findings are not only relevant for the attribution of PTCs for low-carbon H₂ production but also broadly applicable for characterizing electricity-related emissions accounting in different contexts.

With regards to PTC implementation in the US context, we argue for a 'phased approach' in defining time-matching requirements for the attribution of the PTC: annual matching in the near term to kick off electrolytic H₂ production followed by transition to hourly time matching. Further modelling is needed to understand the timing of and the duration over which such a stringent time-matching requirement might be necessary (Supplementary Note 5). The modelling analysis to inform the phase-in and phase-out of hourly time-matching requirements should consider different levels of non-H₂ VRE deployment, H₂ demand and competition between green vs blue H₂, among other factors for various regions.

Methods

Model overview

This study uses the Decision Optimization of Low-carbon Power and Hydrogen Networks model⁵, an open-source energy systems capacity expansion model that co-optimizes investment and operation of electrical power and H₂ sectors while considering their spatially and temporally resolved interactions. The model minimizes the total system cost associated with bulk infrastructure of both commodities (electricity and H₂). This includes annualized capital costs for new capacity and fixed and variable operating costs for both existing and new generation, storage and transmission capacity and any costs for load shedding. The cost minimization is carried out subject to many system and technology-level constraints, including: ramping limits and temporally dependent resource availability limits for VRE generation and system-level constraints, which includes hourly energy supply-demand balance for H₂ and electricity at each location, and case-specific or hourly/annual time matching and energy share requirements. Further details of the model formulation and set-up can be found in ref. 5. Key modifications and additions to the model that were implemented for this analysis are reported in Supplementary Methods equation (1)-(7).

Region and time horizon of interest

Our analysis is based on two regional US grids that are representative of low and high end of VRE generation share in the United States as of 2021: grids managed by the ERCOT and the FRCC. The contributions of grid-connected VRE generation in ERCOT and FRCC grids as of 2021 were 26.5% (3.1% solar, 23.4% wind) and 3.0% (3.0% solar, 0% wind), respectively. Low VRE penetration grids are a common occurrence in the United States as of 2021–for example, Mid-Atlantic (2.4%), New

England (6.1%) and East South Central (0.4%)¹⁴. Full results for FRCC are reported in Supplementary Figs. 19–27.

Power sector modelling assumptions

The data inputs and sources used to define the 2021 system for both ERCOT and FRCC studies are provided in the Supplementary Information. Unless otherwise stated, all costs have been converted to 2021 US dollars. Relevant technology cost and performance assumptions are reported in Supplementary Tables 1 and 2. Across all scenarios, we allow the model to alter the power capacity mix via investment in solar, wind and Li-ion battery storage, both for non-H2 and H2 electricity demand and retirement of existing fossil fuel generation resources. In our analysis, we do not allow for retirements of existing nuclear plants, based on the assumption that it would be economically viable to continue running these plants based on the available credits for nuclear in the IRA. The parametrization of battery storage also considers a self-discharge rate of 0.002% per hour (ref. 15). The model can independently vary the installed energy capacity and power capacity for Li-ion storage so long as the ratio of energy capacity to power capacity (that is, duration) is between 0.15 and 12 h.

Aggregated power generation capacity for all resources for ERCOT and FRCC are reported in Supplementary Table 5. Annual demand and generation information is reported in Supplementary Table 6. The electricity demand data was obtained from PowerGenome¹⁶ and corresponds to demand for 2021 for the two regions.

Hourly resource availability data for onshore wind and solar photovoltaics for each region was generated by averaging hourly resource availability profiles for weather year 2012 from multiple sites, available from a previous study¹⁷. The site-level data for photovoltaics were simulated using site-level irradiation data from the National Solar Radiation Database in conjunction with the open-source model PVLIB. In the case of wind, the site-level resource data were simulated using site-level wind speed data from the National Renewable Energy Laboratory Wind Integration National Dataset Toolkit and power curve data based on the Gamesa G26/2500 wind turbine. Further details about the site-level data calculation are provided in the supporting information of a previous publication¹⁷. Supplementary Fig. 3 shows the geographic areas used to compute average capacity factors for wind and solar generation in FRCC and ERCOT. The regional-level wind and solar availability profiles for FRCC were generated by averaging resource availability profiles over the entire FRCC service territory. In the case of ERCOT, we considered only sites in West Texas and the Panhandle, to account for the fact that this region has the highest quality renewable resources and, thus, is likely to dominate new resource deployment (and already dominates existing resource deployment). As a simplification, we do not impose additional constraints or costs on VRE deployment and thus do not capture the increasing marginal cost of adding wind and solar resources into the system used by other grid studies³.

Supplementary Fig. 1 visualizes the hourly demand profile and VRE resource profile for FRCC, which highlights how wind availability tends to be low during summer months when electricity demand is relatively high. Supplementary Fig. 2 visualizes the VRE resource and demand data for ERCOT, with wind exhibiting less seasonal variation than in FRCC.

Fuel cost assumptions

The model runs were based on fuel price assumptions based on 2019 rather than 2021, as summarized in Supplementary Table 4, so as to not consider the short-term distortion in fuel prices resulting from exceptional events (COVID-19 pandemic, EU energy crisis and so on). Whereas the spot prices of natural gas through 2021 were much higher than 2019 values (as high as US\$6 per one million British thermal units (MMBtu⁻¹)), it is interesting to note that prices in 2023 have come down to levels seen in 2019. For example, according to the data from the US Energy Information Administration¹⁸, the average Henry hub

spot price in January and February 2023 were US\$3.27 MMBtu⁻¹ and US\$2.38 MMBtu⁻¹, respectively.

We use modified fuel costs for natural gas technologies using CCS for H_2 production to implicitly account for the cost of CO_2 transportation and storage. The incremental CCS cost adder to the fuel cost is computed by multiplying the captured CO_2 per MMBtu of NG (Supplementary Table 3) with the assumed CO_2 transportation and storage cost), equal to US\$11.6 tonne⁻¹ per the assumption used by the National Energy Technology Laboratory in their techno-economic analysis of natural gas H_2 production technologies¹¹.

$\rm H_2$ demand characterization and electrolyser capacity modelling

Under both baseload and flexible electrolyser operation in our analysis. electrolyser capacity is sized to meet exogeneous H₂ demand, such that at any hour, only 95% of the installed capacity is available for generation. This is to account for planned outages related to maintenance. We evaluated the system outcomes for varying levels of hourly H₂ demand of 18.4 to 92.1 tonnes of H₂ per hour (0.16 to 0.81 MT per year), which for typical electrolyser specific power consumption (54.3 MWh tonne⁻¹) ranges from 1 to 5 GW of hourly electric power consumption. For simplicity, when discussing results, we use labels such as '1 GW' to indicate an hourly H₂ demand level of 18.4 tonnes of H₂ per hour. Because the total amount of H₂ produced is fixed, the available PTC does not impact the operational behaviour of the electrolyser and therefore we do not consider it in the model but rather include it when estimating the levelized cost of H₂. Supplementary Table 2 summarizes cost assumptions for electrolysers and H₂ storage and natural gas H₂ production with CCS. The latter is only considered in the policy scenario evaluating competition between green and blue H₂ pathways.

Time-matching requirements

As in refs. 3,4, we model two time-matching requirements—hourly and annual. However, here we compare the results for these time-matching requirements under two alternative frameworks for additionality, as defined earlier.

Annual time matching is implemented via a constraint that requires that the annual generation output from contracted wind and solar resources must equal the annual electricity consumption of the electrolyser (Supplementary Methods equation (2)). In contrast, the hourly time-matching requirement is modelled by implementing a constraint that requires the net hourly output of contracted resources (VRE generation and battery storage net discharge) to be at least equal to the hourly electricity consumption of the electrolyser; Supplementary Methods equation (3)). To ensure battery storage charges from eligible VRE generation resources, we allow only the contracted battery, if deployed, to charge in each hour up to the available generation from contracted VRE resources (Supplementary Methods equation (4)). In this implementation, the hourly time-matching requirement allows for the contracted resources to sell any excess electricity in a given hour (for example, an hour with high solar or wind availability) to the grid and earn revenues that can partly offset the capital cost associated with the contracted resources and thereby reduce the cost of H₂ production. The option to sell electricity to the grid when economical is also available in the annual time-matching requirement case, so long as the sum of annual generation matches that of the electricity consumption of the electrolyser.

Metrics of interest

The emissions impact of H_2 production is evaluated using the consequential emissions intensity, defined as the difference in power system emissions with and without H_2 demand divided by the annual quantity of H_2 produced. As noted by others^{3,4}, this is an appropriate metric for assessing emissions intensity in modelling exercises; however, alternative metrics are needed for real world accounting, because the 'counterfactual grid' used to calculate consequential emissions cannot be observed. Although the PTC focuses on life-cycle greenhouse gas emissions, as a simplification, our analysis considers only CO_2 emissions related to fossil fuel combustion for electricity generation because these will dominate overall emissions.

Aside from consequential emissions intensity, we evaluate the levelized cost of H_2 (LCOH), which approximates the cost to the H_2 producer who invests in the electrolyser and H₂ storage and the additional low-carbon electricity generation that is required for the H₂ to be eligible for the PTC under alternative time-matching and additionality requirements. The LCOH can also be thought of as a proxy for the minimum H_2 selling price that would lead to a zero profit for the H₂ producer over the lifetime of the investment in the electrolyser. In practice, the H₂ producer may not directly invest in the VRE plus battery storage assets but could choose to sign a power purchase agreement (PPA) that pays another developer who has invested in these assets. Here we are trying to approximate the cost of the PPA by accounting for the difference between the cost of electricity grid consumption incurred by the hydrogen producer and the revenues from sales of electricity from the VRE plus battery storage assets.

The LCOH includes: the capital cost of added VRE and battery storage (after the 30% investment tax credit under the IRAs), the cost of electricity purchases from the grid for H_2 production, revenue from electricity sales to the grid from the procured renewables (accounting for battery charging/discharging) and electrolyser and H_2 storage fixed costs. Revenues and costs for electricity purchases and sales to the grid are accounted for based on the shadow price of electricity supply-demand balance constraint enforced for each hour of the year in the model. In each case, we report the LCOH with and without including the applicable H_2 PTC.

Additional details on the VRE deployment limit policy scenario

In cases where the VRE capacity deployment constraint is modelled, we have set this limit at 15 GW for illustrative reasons. Average VRE additions in ERCOT for the ten-year period 2012–2021 was 2.7 GW per year. Thus, 15 GW is roughly what might be expected to be installed in ERCOT over five years. Note that ERCOT has been one of the power systems where the interconnection queue issue has so far been relatively modest compared with other US power systems (due to a proactive buildout of transmission).

Calculation of the 45 V and 45Q tax credit impacts on annualized LCOH

The 45 V production tax credit for producing low-carbon H₂ using electrolysers is only available for the first ten years of project operation, and the 45Q tax credit for sequestrating CO₂ captured from SMR with CCS pathway is available only for the first 12 years of operation. H₂ production plants will probably be in operation longer than the window for receiving their respective tax credit-we assume 20 years for electrolysers and 25 years for SMR facilities (Supplementary Table 2). The annualized impact of the tax credit on LCOH must account for the fact that the credit is available only for a portion of the project's full lifetime, that is, the full US\$3 kg⁻¹ PTC will not reduce LCOH by US\$3 kg⁻¹. We conducted an annualized cost calculation in which the respective credit is awarded for the eligible number of years then not awarded in the remaining years of operation. We assume a 4% discount rate and 2% inflation rate for these calculations. The net result is a PTC credit, and resulting reduction in LCOH, of US\$1.95 kg⁻¹ and 45Q credit of US\$56.5 tonne⁻¹CO₂ sequestered.

Data availability

The input data for the various scenarios evaluated along with the outputs are available at https://zenodo.org/records/10198811.

Code availability

The model source code used for this study is available at https://github.com/macroenergy/Dolphyn.jl/tree/main.

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Acknowledgements

This work was funded by the Future Energy Systems Center at the MIT Energy Initiative. We gratefully acknowledge feedback from J. Parsons, R. Stoner and R. Field.

Author contributions

M.A.G. gathered data for the model, performed research, participated in the writing and framework development and generated figures.

A.N.C. and D.S.M. performed the model runs, analysed the output, generated figures and contributed to the writing. D.S.M. developed the framework for the study. T.S. performed analysis and contributed to the framework and to the writing.

Competing interests

The authors declare no competing interests.

Additional information

Extended data is available for this paper at https://doi.org/10.1038/s41560-023-01435-0.

Supplementary information The online version contains supplementary material available at https://doi.org/10.1038/s41560-023-01435-0.

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Peer review information *Nature Energy* thanks Amgad Elgowainy, Oliver Ruhnau and Nixon Sunny for their contribution to the peer review of this work.

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Extended Data Fig. 1 | **Grid dispatch impacts with different qualifying requirements.** Difference in average hourly dispatch in ERCOT between counterfactual and baseline grid under the 'compete' (1st column) and 'noncompete' definitions (2nd column) of additionality and annual (top row) and hourly time-matching requirements (bottom row): A and B: 5 GW of H2 production with baseload electrolyzer operation and annual time-matching requirements. C and D: 5 GW of H2 production with baseload electrolyzer operation and hourly time-matching requirements. Resources with suffix '_PPA' refer to resources added specifically to meet time-matching requirements for H2 production. August 27, 2024

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

Re: Proposed Amendments to the Low Carbon Fuel Standard Regulation of August 12, 2024

Dear Chair Randolph,

The undersigned Direct Air Capture (DAC) Coalition and leading DAC companies thank you for the opportunity to comment on the additional proposed amendments to the Low Carbon Fuel Standard (LCFS) Regulation.

The LCFS is a vital program to lower California's carbon emissions, achieve air quality benefits, and accelerate technology deployment needed for California to achieve its carbon neutrality targets. As the world's first carbon compliance regulation to include DAC, LCFS helped launch the DAC industry and exemplifies California's global leadership in addressing climate change while highlighting the essential role of carbon dioxide removal for achieving net zero.

We commend the California Air Resources Board (CARB) for its dedication and diligent work to design, implement, and refine the LCFS to be an effective emissions reductions and innovation driver. We are specifically grateful for CARB's commitment to engaging with interested stakeholders in this process and for considering our feedback about LCFS regulations that will have profound implications for the DAC industry.

The latest proposed amendments to the LCFS Regulation Section 95488.8(i)(1)(C) issued on Monday, August 12th move in the right direction in allowing a longer temporal period in book-and-claim accounting for low-carbon intensity (CI) electricity for DAC (three quarters) as compared to the previous proposed amendments of January 2, 2024 (quarterly). **However**, **book-and-claim accounting spanning three quarters cannot accommodate DAC's continuous 24-7/365 operations given the seasonal fluctuations in wind and solar power production, and is therefore not fit for purpose nor achievable for DAC at this stage of the industry's development. Instead, annual book-and-claim accounting for DAC is necessary, appropriate, and consistent with the leading global standards today. Moreover, there is a lack of analytical evidence that emissions accounting accuracy or resource shuffling prevention would be enhanced by three-quarter accounting compared with annual**.

The need for annual book-and-claim matching for DAC is driven by underlying physical and technological constraints, as well as market realities. DAC is more nascent in technological

development and deployment than other technologies relevant to LCFS. For example, the first commercial DAC plus storage facility commenced operation in 2021, while advancements in hydrogen electrolysis are building on over 100 years of commercial operational experience.

DAC technologies need to operate constantly with limited ability to ramp up and down load because they often contain equipment components and chemical and physical processes that cannot be rapidly fluctuated or turned on and off. Currently, the vast majority of low-CI electricity generation capacity being added to the US grid is intermittent renewable electricity sources like solar and wind. Book-and-claim accounting to match intermittent renewable supply with a constant DAC load over an annual period within the same grid is a challenge that requires detailed modeling and risk management to account for annual variability in renewable output. Limiting the accounting period to three quarters significantly exacerbates the challenge, since the electricity production from these intermittent renewable resources is seasonal and a quarter of the annual cycle would be missed.

Any temporal matching period spanning less than a full year would present a severe barrier for DAC deployment given the current state of technology's needs for continuous, additional and local low-emissions electricity supply, and the lack of market and technological systems to support more granular temporal matching. For example, one commercial DAC project currently under development in the United States estimated that three quarter book-and-claim matching could require the the procurement an additional 10-15% low-CI power under a three quarter book-and-claim accounting period compared with an annual period, increase electricity price risk and the risk of power matching shortfalls, and could make economics infeasible.

Recognizing these constraints, leading global standards bodies and registries provide for annual book-and-claim for DAC, with an eye to re-evaluate in the future as DAC and electricity sector technologies, markets, and policies evolve. These standards include Verra, Puro.earth, and Isometric¹. Our DAC facilities under development will sell credits to voluntary market customers using the carbon registries' methodologies with annual matching. **Importantly, we cannot** generate credits with different matching periods from the same facility, since we cannot effectively operate under two different sets of energy procurement and operating patterns at the same facility. The LCFS market can help accelerate DAC facilities and add to demand to justify new facilities, but only if generating LCFS credits is compatible with the global DAC standards and market.

Over time as DAC matures with technology advancements, economies of scale, market and supply chain development, and as firm dispatchable low-carbon electricity becomes more available, increasingly granular book-and-claim accounting may become more achievable and could be considered under LCFS. We would like to highlight our suggestion for CARB to convene a dialogue with key stakeholders to consider how electricity book-and-claim accounting for DAC should evolve alongside DAC industry maturation. Such a dialogue

¹ Isometric standard currently allows annual book-and-claim for projects under 10 MW

would provide a venue for collecting valuable input to ensure that LCFS requirements mitigate resource shuffling and maximize long-term climate benefits.

We reaffirm our support for the LCFS and gratitude for CARB's important work, and we look forward to further engagement to help ensure the LCFS is a practically workable market that can help drive DAC technology deployment.

Signed:

Direct Air Capture Coalition CarbonCapture Inc. Heirloom Carbon Technologies Climeworks Corporation 1PointFive February 20, 2024

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

Re: Proposed Amendments to the Low Carbon Fuel Standard Regulation

Dear Chair Randolph,

The undersigned Direct Air Capture (DAC) Coalition and leading DAC companies welcome the opportunity to comment on the Proposed Amendments to the Low Carbon Fuel Standard (LCFS) Regulation. We affirm the urgent need for both reducing total emissions and scaling carbon removal to limit global warming to 1.5 degrees Celsius. We therefore commend the California Air Resources Board (CARB) for its leadership in recognizing the importance of DAC as an eligible technology under the LCFS, in support of California's carbon removal and net-zero goals. However, we believe that the proposed quarterly matching book-and-claim accounting for low-Cl electricity (Section 95488.8(i)(1)(C) of the Proposed Amendments) would present a significant barrier to DAC deployment today, due to current constraints in low-Cl electricity supply and temporal attribute market systems. Such an outcome could set back California's plan to achieve net-zero carbon emissions by 2045. In the near-term, an annual book-and-claim accounting system would facilitate the growth of the industry, create jobs, and help ensure deployment of a vital tool to enable the state of California to meet its net-zero goals.

Instead of prescribing a temporal matching framework that is not fit for purpose and does not reflect the current state of low-CI electricity supply or temporal attribute markets, we encourage CARB to convene a dialogue with key stakeholders to consider matching requirements appropriate for DAC as the technology and markets for temporal matching mature alongside DAC deployment. Such a dialogue would provide a venue for collecting valuable input to ensure that LCFS requirements mitigate resource shuffling and maximize long-term climate benefits. Prescribing an outcome without a robust conversation risks undercutting the growth of an industry that is likely to be vital to meet the State's 2045 net-zero goal.

Low-CI electricity requirements for successful commercialization of DAC

As leading DAC technology developers and proponents of permanent carbon removals, we are committed to advancing high-quality projects that enshrine the highest levels of transparency, accountability, safety, environmental stewardship, and societal benefits, with full lifecycle emissions accounting_including energy usage_that ensures net removal of carbon dioxide

(CO₂) from the atmosphere. We note the following key points that outline the electricity needs for DAC projects and our specific concerns with the proposed amendments:

- DAC technology requires energy to operate, including from electricity. In order to
 maximize net removal of CO₂ from DAC facilities, the electricity supply must have low
 emissions. DAC facilities must also maximize continuous running time in order to
 remove the maximum amount of CO₂ at the lowest levelized cost, particularly given the
 nascent stage of DAC technology deployment and associated early-stage technology
 costs. DAC technologies therefore require a continuous, reliable, and economic
 electricity supply.
- Section 95488.8(i)(1)(C) of the Proposed Amendments includes criteria required for low-CI electricity supplying DAC projects. Criterion 1 requires that low-CI electricity be supplied to the grid within the local balancing authority where the electricity is consumed (local supply). Criterion 3 requires low-CI electricity to be supplied from new or expanded production within three years of the start of the direct air capture project (additionality).
 We strongly support these criteria for local supply and additionality as key pillars to mitigate against resource shuffling where existing low-CI electricity is redirected and backfilled with higher-CI electricity.

Why quarterly book-and-claim proposal will hamper the growth of DAC

Section 95488.8(i)(1)(C) Criterion 4 requires quarterly book-and-claim accounting for low-Cl electricity, however, for the following reasons we believe that requirement would make it significantly *more* difficult for DAC projects to generate credits in the LCFS, undermining the effectiveness of the program and presenting a barrier to the deployment of DAC projects around the country:

- Intermittent renewable electricity is the lowest cost and most available low-CI electricity source for DAC projects today. The technology for supplying continuous 24/7 low-CI electricity at the scale and duration needed for DAC is not yet readily available, and the market systems for tracking and trading the necessary low-CI power attributes at sub-annual time resolution do not currently exist. This combination presents DAC projects with significant cost and financial risk challenges for complying with sub-annual matching today¹. For example, one commercial DAC project currently under development in the U.S. estimated that quarterly book-and-claim matching could require 25% more power to be over-contracted and not consumed by the DAC project, at substantial market price risk, compared with annual matching even in the most favorable locations for renewable resources.
- At this nascent stage of both DAC technology deployment and availability of continuous 24/7 low-CI electricity, an annual book-and-claim matching period for DAC under LCFS is appropriate. This would account for the full annual seasonal cycle for intermittent renewables. Matching periods shorter than 12 months will

¹ Verse, "Heirloom Portfolio Planning Case Study" 2024: (https://verse.inc/blog/heirloom-portfolioplanning-case-study/)

significantly impact the financeability of early DAC projects and impede deployment of this critical climate technology.

Alternative proposal for annual book-and-claim accounting

The inclusion of DAC as an eligible technology to receive credits under the LCFS is an important recognition of the potential for DAC to support California's carbon removal and netzero goals as set forth in law under SB905 and AB1279. To accomplish the state's goals, **an annual period for book-and-claim matching of low-CI electricity supply for DAC projects is necessary and appropriate** given the inherent challenges present within the current technology, market systems, and economics for continuous low-CI electricity.

We request that CARB revise Section 95488.8(i)(1)(C) Criterion 4 of the Proposed Amendments to require annual book-and-claim matching for low-CI electricity for DAC projects in order to help facilitate early DAC project deployment. This would be consistent with other leading global standards. For example, Verra's methodology for electricity consumption emissions, currently under development, includes annual matching requirements². Importantly, DAC projects already under development in the U.S. are being designed with the annual standard in mind. Sub-annual matching could be phased in at a later time once the necessary technologies and markets are available and accessible for DAC projects.

Climate experts, from the Intergovernmental Panel on Climate Change³ to the National Academies of Sciences⁴, have made clear the need for billion-ton scale carbon removal by midcentury alongside rapid emissions reductions. Therefore it is critical that DAC deployments advance today to support the ongoing technology development needed to reduce future DAC deployment costs and enable deployment at climate-relevant scale in the coming decades.

California, through its LCFS regulation, has the opportunity to set the bar for rigorous policy design that accelerates DAC technology deployment and unlocks economic and job opportunities in California and around the U.S.

We would welcome the opportunity for continued engagement with CARB on these important matters.

Signed:

² Verra, "Tool for the Estimation of Emissions Associated with Electricity Consumption" 2024": (https://verra.org/methodologies/tool-for-the-estimation-of-emissions-associated-with-electricityconsumption/)

³IPCC, "Summary for Policymakers. Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change," 2022:

⁽https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_SummaryForPolicymakers.pdf) ⁴ National Academies of Science, Engineering & Medicine, "Developing a Research Agenda for Carbon Dioxide Removal and Reliable Sequestration," 2019: (https://www.nationalacademies.org/ourwork/developing-a-research-agenda-for-carbon-dioxide-removal-and-reliable-sequestration)

Direct Air Capture Coalition CarbonCapture Inc. Heirloom Carbon Technologies Climeworks Corporation 1PointFive



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October 16, 2024

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

Submitted electronically via upload to <u>https://ww2.arb.ca.gov/lispub/comm/bclist.php</u>

SUBJECT: SDG&E Comments on Proposed Second 15-Day Changes to the Low Carbon Fuel Standard Regulation

Dear Chair Randolph and Honorable Board Members:

SDG&E appreciates the opportunity to provide comments in response to the California Air Resources Board (CARB) Proposed Second 15-Day Changes to the Low Carbon Fuel Standard (LCFS) regulation.¹ The LCFS plays a vital role in reducing greenhouse gas (GHG) emissions in the transportation sector and improving air quality in the State. SDG&E strongly supports the LCFS program for this reason.

SDG&E is pleased to offer its general support for the direction of the Proposed Second 15-Day Changes and a few limited comments on the proposed changes below.²

273.1 I. SDG&E supports the proposed updates to the Electric Distribution Utility (EDU) definition, which reflect current electric sales and promote equal treatment across similarly sized utilities. As was discussed in SDG&E's previous comments on the first 15-day regulatory changes,³ the definition of EDU that is currently used in the effective regulation relies on outdated 2017 data. Updating the EDU definition to reflect more current 2022 electric sales data ensures that similarly sized utilities have comparable contributions to the statewide Clean Fuel Reward Program.

¹ CARB's Proposed Second 15-Day Changes to Proposed Regulation Order are available at: <u>https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/2nd_15day_atta-1.pdf</u>.

² SDG&E also aligns with the comments submitted by California Electric Transportation Coalition in response to the 2nd 15-day package.

³ See San Diego Gas & Electric Company's August 27, 2024, comments at: <u>7429-lcfs2024-UzJUJ1M1VHILfgN3.pdf (ca.gov)</u>.

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- 273.2 II. SDG&E supports the proposed changes to parameters surrounding the implementation of EDU Holdback Credit Equity Projects. These include changes proposed to preserve the existing 10% cap on administrative costs to ensure appropriate resources are available to implement programs; clarify that medium-sized investor-owned utilities must spend 50% of holdback credit proceeds on equity projects as opposed to 75%; allow for rollover of unspent funds to future year budgets; and expand the acceptable uses of holdback equity spending to include various "make-ready" improvements that facilitate zero-emission vehicle adoption. The proposed changes will provide greater flexibility for utilities to support their customers with a more affordable transition to ZEVs.
- 273.3 **III. SDG&E** is encouraged by the provisions that would continue to provide needed support for the use of hydrogen and renewable natural gas (RNG). The proposed amendments include key elements that will help accelerate the adoption of these important fuels but could go further to ensure that hydrogen production is not being held to higher standards than other technologies given its important role in advancing medium- and heavy-duty zero-emission vehicle goals.⁴
- Hydrogen Infrastructure and Incentives: The inclusion of provisions that enhance zero-emission vehicle infrastructure eligibility and increase support for zero-emission vehicle fueling is crucial. These changes will facilitate the expansion of hydrogen refueling stations, making hydrogen fuel cell vehicles more accessible to consumers and businesses alike. While the proposed changes to hydrogen feedstocks that can qualify for credit generation is better aligned with hydrogen renewable content requirements across the LCFS regulation, the program would still benefit from more focused alignment with the renewable requirements for the electricity grid. SDG&E supports the intent of CARB's changes to allow more time for renewable hydrogen to scale up and effectively displace fossil hydrogen used in California, though recognizes that further technical refinements to the regulation may be needed to realize that vision.
- RNG Utilization and Sustainability: The proposed refinements to feedstock sustainability provisions and the continued support for RNG projects are commendable. By maintaining incentives for RNG, the amendments ensure that RNG remains a viable and attractive option for reducing carbon intensity in the transportation sector. As SDG&E previously noted, providing regulatory certainty for projects utilizing avoided methane

⁴ SDG&E supports the technical issues the California Hydrogen Business Coalition has detailed in their letter, outlining how the LCFS program can encourage investment in clean fuels.

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crediting pathways is critical for maintaining the financial viability of existing projects.⁵

Thank you for your consideration of these comments. SDG&E looks forward to continuing to support the LCFS and the important role it plays in advancing zero-emission vehicles and infrastructure in California. Further, SDG&E is interested in collaborating with CARB and stakeholders to explore opportunities to create similar structures/programs that could help achieve GHG emissions reductions in the industrial sector by incentivizing the use of clean fuels. We welcome further discussion on this topic.

Sincerely,

Jareh M. Taken

Sarah M. Taheri Regulatory Affairs Manager

⁵ See SoCalGas' and SDG&E's August 27, 2024, Comments on CARB's Proposed Amendments to the LCFS at: <u>https://www.arb.ca.gov/lists/com-attach/7573-lcfs2024-UyAHbgdlUGIGbFUy.pdf</u>.


October 14, 2024

Air Resources Board 1001 | Street Sacramento, CA 95812

Crimson Renewable Energy would like to first say thank you for the opportunity to comment on the second 15-day package (2nd 15-day Notice) for the Low Carbon Fuel Standard (LCFS) that 274.1 was published on October 1, 2024. Additionally, we greatly appreciate the efforts of CARB staff on the LCFS and its engagement with stakeholders in moving forward to meet California's carbon / GHG reduction goals.

> Crimson Renewable Energy operates the largest biodiesel production facility in California, creating ultra-low carbon biodiesel to refuel our communities. Via its biodiesel production facility in Bakersfield that has been operating since 2011, Crimson contributes over \$100 million a year to the California and local economy and makes a meaningful contribution to cleaner air in the San Joaquin Valley via cleaner burning biodiesel that offers lower emissions of particulate matter and other harmful air contaminants. Thus, Crimson has been an active stakeholder and direct participant in the LCFS since the beginning of the regulation and continues its longstanding support of California's overall climate and air quality improvement goals

Introduction and Reiteration of Prior Comments

On October 1, 2024, CARB released a second 15-day package that included new proposed amendments to the LCFS following earlier proposals released in December 2023 (the Initial Statement of Reason) and August 2024 (1st 15-day notice).

Earlier in 2024, in response to the Initial Statement of Reason and the first 15-day notice Crimson submitted comments that included support of comments made by the Clean Fuels Alliance America (CFAA) and California Advanced Biofuels Alliance (CABA). These combined comments are summarized as follows:

- 274.2 1) Strengthen the CI reduction targets.
- 274.3 Introduce sustainability provisions for crop-based biofuels and the lack of much-needed updates to the indirect land use change model (GTAP).
- 274.4 3) Remove the exemption for fossil jet fuel.

- 274.5 4) Strong support of the proposed carbon intensity (CI) targets, including the 9% stepdown in 2025.
- 274.6 5) Strong opposition to the proposed 20% limit on credit generation from biodiesel and renewable diesel made from soybean and canola oil.
 - 6) The Auto Correct Mechanism (ACM) should be based on the most recent trailing 12-
- 274.7 month data, not annual reporting period data, and that once the ACM has been triggered, the accelerated carbon reduction requirements should take effect for the next upcoming reporting quarter
- 274.8 7) Continued concern over the sustainability provisions and CARB's unwillingness to update GTAP over the past decade despite our repeated requests.

To the extent these comments and concerns have not been addressed in this rulemaking, Crimson continues to reiterate the above comments.

Limits on Biomass- based Diesel Produced from Vegetable Oils

274.9 Crimson is very concerned about arbitrary limits being placed on credit generation from biomass-based diesel produced from vegetable oil feedstock without any technical or scientific reasoning for enacting such limitations, or the proposed timeline. CARB's own analysis has shown that placing such limitation on the use of certain biofuels in LCFS will lead to increased GHG, particulate matter and other pollutants, which ultimately leads to higher societal healthcare costs¹. Additionally, the CARB staff report suggested focusing credit generation limits on feedstocks from "High Risk" non-North American regions. The proposed limits are clearly not doing this and instead creating limitations on biofuel production that would utilize North American crops, even though there is no clear evidence of significant land use change in North America as a result of LCFS. Crimson urges CARB to instead apply such limits on cropbased biofuels in a more rational manner that targets the "High Risk" regions in terms of potential for adverse land use change.

Accordingly, Crimson supports the recommendations from CABA to (a) modify the limits on credit generation in section 95482(i) and the sustainability provisions in section 95488.9(g) to only apply to non-North American agricultural lipid feedstocks, with the credit limit to be applied as follows: 50% in 2028 and 25% in 2031, or (b) alternatively, direct CARB's Executive Officer (using their enforcement discretion authority) to apply the credit limit only to non-North American.

Calculation of Deficit Obligation for Verified CI Exceedance

274.10 Crimson supports Clean Fuels Alliance America (CFAA) and California Advanced Biofuels Alliance (CABA) comments requesting the Board to direct CARB staff to remove the language in

¹ <u>https://ww2.arb.ca.gov/sites/default/files/2024-04/LCFS%20April%20Workshop%20Slides.pdf</u>

§95486.1(g)(1) requiring deficits to be four times the CI (carbon intensity) exceedance. This amount is excessively punitive. Provisions already exist in the LCFS regulation to address misconduct and to recalculate credits once final data is available via the Annual Fuel Pathway Report (AFPR) and Quarterly Fuel Transactions Report (QFTR).

Carbon intensity (CI) is a complex calculation and is impacted by many variables. Certified pathway holders calculate CIs from 24-months of data, which serves to include significant feedstock and energy and chemical utilization that determine CI. However, all biofuel production facilities have process variability that will affect energy and chemical utilization, and thus impact the actual CI. The reality of biofuel production operations is that there is always process variability that is less predictable, and this variability may result in a CI that very slightly exceeds the pathway CI and/or the prior annual fuel pathway verified CI. This should not result in automatic and harsh penalties.

CARB has not provided justification or need for such an excessive penalty provision in the LCFS. CARB's enforcement and penalty authority already give CARB the ability to address wrongdoing and already give CARB the latitude to apply harsh penalties where that may be justified. By making the harsh penalty automatic, it removes CARB's ability to remedy situations on a caseby-case basis.

Requirements for Feedstock Attestation Letter

274.11 The requirements in section § 95488.8 (g)(D) unnecessarily duplicate responsibilities already on the fuel pathway holder and impose onerous requirements on supply chain participants that may have no willingness or need to participate in the LCFS program. This requirement should be removed.

The requirement that every single node in the specified source feedstock supply chain provide such a letter is unreasonable. For example, the supply chain may include storage sites that are nothing more than a storage tank owner who leases space to a feedstock vendor/aggregator/trader. That owner has no knowledge of LCFS, is not otherwise obligated in any way with respect to compliance with LCFS regulation and would need to hire expensive legal counsel to evaluate the obligations they would be attesting to. Such feedstock supply chain participants will refuse to sign the letter and/or at the earliest opportunity, consider alternative options to renting tank space for feedstock storage that now incurs an additional obligation for regulations that do not otherwise apply to them. This is just one example of supply chain participants opting out from supplying low-carbon feedstocks for biofuel production that for California consumption.

The market has already experienced limitations on specified sources that limit low carbon feedstock availability due to feedstock vendors' unwillingness to submit to existing LCFS verification requirements. The unwillingness is not related to the inability to adhere to program requirements but is because the vendors have alternate markets (e.g. animal feed) without onerous LCFS requirements. Adding additional requirements such as a feedstock attestation from each specified source feedstock supply chain will materially degrade the availability of low carbon feedstocks for credit-generating fuels. Thus, Crimson respectfully requests CARB to remove the unnecessary requirements in § 95488.8 (g)(D).

Tailpipe Emissions in GREET 4.0

The GREET 4.0 model Biodiesel Simplified Calculator includes an updated Tailpipe Emissions value in the Pathway Summary sheet cell F33 (linked to CA-GREET 4.0 cell E28. In GREET 3.0 this value was 0.76. CARB's CA-GREET4.0 Supplemental Document states, "The tailpipe emission factors for biodiesel, renewable diesel, and alternative jet fuel are derived from CA-GREET3.0." If that is the case, the GREET 4.0 model should use the 0.76 value.

Sincerely,

Harry Simpson President & CEO Crimson Renewable Energy



October 16, 2024

275.2

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

Comments on LCFS 15-Day Changes

Dear Chair Randolph and Members of the Board:

Our organizations write to provide comments on the recent 15-day changes proposed for the Low Carbon Fuel Standard (LCFS) amendments. As noted in previous letters from health organizations and others in the advocacy community, the initial proposal included many concepts that we believe would have strengthened the health and equity outcomes of the program going forward and we expressed our concerns that subsequent proposals weakened the potential for health improvements.

> With the latest proposals, we are increasingly concerned that the amendments have moved further from the initial proposal and offer our comments to inform future actions beyond the potential adoption or rejection of the latest staff proposal. We view the following as significant elements of the proposals that warrant closer scrutiny by the board:

- Extending the life of fossil fuel-based hydrogen credits from 2030 to 2035 and maintaining lengthy phase-out schedules for other credits of concern (*e.g.*, methane, fossil-fuel projects).
- 275.3 Continued exemption of fossil-based aviation fuels.
 - 275.4 Lack of equity focus on proposed base credits for auto manufacturers.
- 275.5 Limited cap on crop-based fuels that invite significant indirect land use change (ILUC) and other programmatic and environmental impacts.

We believe that the board should direct CARB staff to include the following elements (*in italics below*) in the resolution assuming the LCFS package moves forward. If the package does not move forward as proposed, we would encourage the board to maintain progress toward regulatory certainty in the dairy and airport sector items noted below:

- Regulation of dairy emissions given the significant pollution associated with dairy operations in California and the ongoing challenges in addressing these emissions promptly through the LCFS, CARB should establish a date for the completion of direct regulation of dairy emissions in California.
 - CARB staff will embark on a multipollutant standard for dairies in support of local health improvement, attainment of climate standards, and attainment of ozone and

annual particle pollution standards, the latter of which was recently strengthened by US EPA and will require stronger controls.

- Zero-emission standards for airport ground support equipment (GSE) given the need to protect the health of airport personnel, CARB should establish a date for completion of zero-emission ground support equipment for airport operations.
 - CARB staff will complete a zero-emission ground support equipment regulation as noted in the 2022 State Implementation and Draft 2025 Mobile Source Strategy as a near-term measure to be completed by 2029 to meet clean air and climate standards, and Executive Order N-79-20, which calls for off-road equipment to be zero-emission by 2035.
- Specify that if an automaker incentive program is approved for use of base credits, incentives are directed only to low- and moderate-income consumers. While CARB included voluntary equity programs under the Advanced Clean Cars II program, the LCFS direction must target incentive programs for vehicle purchases to consumers of limited means to close the ZEV equity divide.
 - CARB staff will broaden the scope of the OEM base credit requirements to include equity-based provisions, such as income-eligibility requirements to focus use of OEM base credits that benefit low- to moderate-income consumer choices.
- Review and update ILUC factors in the absence of a comprehensive cap on crop-based biofuels.
 - CARB staff will, in the first quarter of 2025, convene an expert review panel to address indirect land use change factors to protect against ongoing crop-based fuel credit glut impacts on program effectiveness.

Although we remain deeply concerned with the proposed amendments to the LCFS, we believe that CARB can include strong direction for future actions in the Board resolution to improve air quality and support public health. We look forward to continuing to work with the board and staff on next steps. Please contact Will Barrett with the American Lung Association for additional information at <u>William.Barrett@Lung.org</u>.

Sincerely,

Will Barrett Senior Director, Nationwide Advocacy, Clean Air **America Lung Association**

Bill Magavern Policy Director **Coalition for Clean Air**

Barbara Sattler, RN, MPH, DrPH Leadership Council California Nurses for Environmental Health and Justice Matthew Marsom Vice President for Policy and Programs **Public Health Institute**

Joel Ervice Associate Director **Regional Asthma Management & Prevention (RAMP)**

Robert M. Gould President San Francisco Bay Physicians for Social Responsibility

Powering forward. Together.



276.1

276.2

October 16, 2024

Chair Liane Randolph and Members of the Board California Air Resources Board 1001 | Street Sacramento, CA 95814

Sacramento Municipal Utility District's Comments on the Second Proposed Re: 15-Day Changes to the Low Carbon Fuel Standard Amendments

The Sacramento Municipal Utility District (SMUD) appreciates the opportunity to support the Low Carbon Fuel Standard (LCFS) regulation and provide comments on the California Air Resources Board's (CARB or Board) second Proposed 15-Day Changes to the Proposed Amendments to the Low Carbon Fuel Standard Regulation issued on October 1, 2024 (Second 15-Day Changes).¹ SMUD appreciates that the amendments included in the Second 15-Day Changes addressed several remaining concerns² and appreciates CARB Staff's effort throughout the LCFS rulemaking process. SMUD also supports the comments submitted by the California Electric Transportation Coalition (CalETC) submitted on October 16.

In particular, SMUD appreciates the following changes that substantially improved the Proposed Amendments to the LCFS regulation:

276.3	•	Clarifying that medium POUs are required to spend 50 percent of holdback credit
		proceeds on equity projects, as opposed to 75 percent.
276.4	•	Redefining "Electrical Distribution Utility" with updated values.
	•	Specifying that base credit proceeds previously allocated to the Clean Fuel Reward
276.5		program by Electrical Distribution Utilities (EDUs) that remain unspent will be returned to
		those EDUs if base credits are allocated to the original equipment manufacturers

- Us if base credits are allocated to the original equipment manufacturers (OEMs). 276.6
 - Addition of "panel and service upgrades" to the equity holdback project list.
- Addition of coordination with "a community-based organization, or a California Community College" to the re-skilling and workforce development projects to the equity 276.7 holdback project list.
- Addition of a ten percent administrative cost cap to the utility holdback programs instead 276.8 of five percent.

¹ Second Notice of Public Availability of Modified Text and Availability of Additional Documents and/or Information, Proposed Low Carbon Fuel Standard Amendments (October 1, 2024) available at Second Notice of Public Availability of Modified Text and Availability of Additional Documents and/or Information. ² Sacramento Municipal Utility District's Comments on the Proposed Amendments to the Low Carbon Fuel Standard (February 20, 2024) available at https://www.arb.ca.gov/lists/com-attach/6970-lcfs2024-AXJROgRwBTIKU1Ix.pdf; Sacramento Municipal Utility District's Comments on the Proposed 15-Day Changes to the Low Carbon Fuel Standard Amendments (August 27, 2024) available at 7514-lcfs2024-UGJXYVNgWT4CKgMz.pdf (ca.gov).

- 276.9
- Specifying that if an EDU does not spend the required percentage on equity projects in a calendar year, the shortfall of spending will roll over to their total equity spending requirement for the following year.

Further rationale for these changes can be found in SMUD's comments on the 45-Day Language and first 15-Day Changes, and in comments submitted by CalETC. SMUD, in coordination with CalETC, looks forward to working with CARB staff to clarify the process and operation of utility holdback programs and the CFR program, particularly to plan for potential reallocation of a portion of base credits to the OEMs.

Conclusion

Thank you for the opportunity to provide feedback on the Proposed Amendments. SMUD looks forward to continuing to work with CARB on amendments to strengthen the LCFS regulation.

/s/

JOSHUA STOOPS Government Affairs Representative Sacramento Municipal Utility District P.O. Box 15830, MS B404 Sacramento, CA 95852-0830

/s/

KATHARINE LARSON Regulatory Program Manager Sacramento Municipal Utility District P.O. Box 15830, MS B404 Sacramento, CA 95852-0830

/s/

JOY MASTACHE Senior Attorney Sacramento Municipal Utility District P.O. Box 15830, MS B406 Sacramento, CA 95852-0830

cc: Corporate Files (LEG 2024-0133)



October 16, 2024

Submitted electronically at: https://ww2.arb.ca.gov/applications/public-comments

California Air Resources Board 1001 I Street Sacramento, California 95814

- Re: Airlines for America[®] Comments on Proposed Low Carbon Fuel Standard Amendments posted October 1, 2024
- 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 posting of Second Notice of Public Availability of Modified Text and Availability of Additional Documents and/or Information regarding Proposed Low Carbon Fuel Standard Amendments.²

277.1 These comments supplement our statements provided in written comments on the proposed amendments submitted on February 20, 2024. In those comments we stated that a different approach is necessary for CARB and the aviation industry to achieve our mutual objectives to expand SAF use in California. CARB subsequently issued a 15-Day Changes to Proposed Regulation Order which withdrew the proposal to eliminate the jet fuel exemption and retain the existing opt-in approach for SAF under the CARB LCFS Program. A4A supported CARB's withdrawal of the proposal to eliminate the jet fuel exemption and it's retention of the existing opt-in approach for SAF under the CARB LCFS Program as proposed in this new "15-Day" proposal.

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. Individual airlines have also adopted specific SAF targets and goals to send a clear market signal for affordable SAF. 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.

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, February 20, 2024, May 10, 2024 and August 27, 2024.

California Air Resources Board October 16, 2024 Page 2

277.1 cont. 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 not only incentivizes SAF production but also helps reduce the price difference between SAF and conventional jet fuel. We look 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.

A4A supports the revised proposal that does not add jet fuel to the list of regulated fuels under the LCFS program. In our prior comments to the initial December 19, 2023 Proposed Amendments to the CARB LCFS Program we expressed concerns with CARB's proposal to remove the exemption for jet fuel under the program. CARB's Initial Statement of Reasons (ISOR) stated the purpose and intent of was to increase the production and use of SAF in California. We disagreed with the assessment that the proposal would achieve the desired result, and asserted that making jet fuel an obligated fuel under the LCFS program would not, by itself, result in increased SAF production, availability and use in California. We are pleased that after further analysis CARB has reached a similar conclusion, and that that conclusion has been retained in the subject revised 15-day proposal.

As we stated in prior comments, 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. Because of the relative economic advantages of renewable diesel compared to SAF, fuel producers will continue to prioritize renewable diesel production instead of SAF. We share CARB's objective to increase the use of alternative jet fuel in the State. To significantly increase SAF production, availability, and use of SAF in California, one must address the economic disadvantages of SAF production relative to Renewable Diesel.

The existing opt-in crediting model under the LCFS, combined with U.S. federal incentives provides the foundation for 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. We look forward to opportunities to work together with CARB and other SAF stakeholders to explore policy and non-policy interventions that have the potential to achieve this mutual objective.

³ <u>The Economic Impact of Civil Aviation on the U.S. Economy, State Supplement, US Department of</u> <u>Transportation, November 2020</u>

California Air Resources Board October 16, 2024 Page 3

* * *

Thank you for your consideration of our comments. Please do not hesitate to contact us if you have any questions.

Sincerely,

harde _____

Kevin Welsh Vice President, Environmental Affairs and Chief Sustainability Officer kwelsh@airlines.org



October 16, 2024

California Air Resources Board 1001 I Street Sacramento, CA 95814 Via Online Submission

Comments on the Second 15-day Changes to the Proposed Low Carbon Fuel Standard

Dear California Air Resources Board (CARB) Low Carbon Fuel Standard Program Staff:

Thank you for the opportunity to provide comments in response to the proposed amendments to the Low Carbon Fuel Standard.

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 2022 Scoping Plan Update—DME along with other clean alternatives to petroleum are a key part of the solution for the state to reach its legislatively-mandated greenhouse gas reduction targets.

Responses to Draft Amendments

278.1 Oberon supports the proposed amendment package and appreciates the significant efforts that have gone into developing these changes.

In the 'Other Comments' and 'Recommendations for Future Action' sections below we offer suggestions for further clarity where the proposed amendments may benefit from a more fulsome consideration of rapidly developing technology and commercial practices.

278.2 We also express our gratitude for your engagement and support for DME and we note with pleasure the inclusion of DME on *Table 4. Energy Densities and Conversion Factors for LCFS Fuels and Blendstocks*.

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.



Other Comments

• Carbon Intensity (CI) Benchmarks

- 278.3 Oberon strongly supports the increased stringency to a 9% carbon intensity reduction in 2025 from the 5% originally proposed in the 45-day package. This adjustment reflects a necessary step toward more robust climate action. This single adjustment will translate into millions of additional tons of GHG emission reductions and act as a supportive market signal for new clean fuel projects that have been or are being constructed to bring more clean fuels to market.
- 278.4 We commend CARB for the inclusion of the Auto Acceleration Mechanism as a forwardthinking measure to ensure the program's dynamism. The proposed change in the Second 15-Day package to four quarterly announcements from one annual announcement for determination of whether an AAM trigger will occur further exemplifies CARB's dedication to the success of the program and their recognition of the importance of timely credit price stabilization to the market and the program's stakeholders.

The AAM is a necessary compliment to the CI target adjustment and as designed, will send a clear, supportive, and unambiguous market signal to continue investments in clean fuels by tightening the program in the event overperformance occurs. Adoption and implementation of this mechanism will ensure that potential emission reductions are not left on the table and will help California reach its climate goals faster if triggered.

• Avoided Methane Crediting

278.5 Oberon strongly supports the inclusion of avoided methane crediting in the proposed changes. Avoided methane emissions are a critical part of science-based life cycle assessments, and their inclusion in CI calculations is consistent with internationally recognized standards of carbon accounting. The Second 15-Day package proposes that a project certified before the effective date of the regulation are limited to three consecutive 10-year crediting periods, and projects certified after the effective date of regulation but before January 1, 2030, will be limited to two consecutive 10-year crediting periods.

As stated in our August 27, 2024, comment letter, while we understand CARB's intention is to better align the proposed end dates for avoided emission pathways with its mobile source regulations focused on transitioning to electric vehicles, we are concerned about CARB's proposed limitation on the number of crediting periods for avoided methane emissions projects. This change negatively impacts these projects, particularly those that are already in development or near completion that were funded with the expectation they would be eligible for up to three 10-year crediting periods. The reduced crediting period could undermine the financial viability of these initiatives, which rely heavily on LCFS credits to justify the significant investments required. We urge CARB to reconsider



278.5 cont. this reduction, as it may inadvertently discourage the development of methane mitigation projects that are crucial to achieving California's climate goals. Maintaining the original structure of three crediting periods would provide the necessary support to ensure the long term viability of these projects while more accurately representing their life-of-project contributions to reducing greenhouse gas emissions.

• Sustainability Requirements

- 278.6 Oberon appreciates CARB's amendments to the Sustainability Requirements for Biomass in the Second 15-Day package which clarify the exception of "specified source feedstocks" listed in section 95488.8(g)(1)(A), previously referred to as "biomass" in the First 15-Day package. This proposed amendment provides additional clarity that is beneficial to identifying the proper requirements for different pathways and feedstock types.
 - Book-and-Claim RNG Deliverability

278.7

We recognize and appreciate CARB's efforts to enhance the integrity and accuracy of the proposed RNG deliverability requirements, consistent with RPS eligibility rules. We note the ZEV penetration metric in the Second 15-day package delivers an improved level of transparency from the previous language concerning "if the Executive Officer approves a gas system map by July 1, 2026".

While we wish to highlight that we do not believe imposing deliverability requirements is necessary to achieve the goals of the LCFS, and we respectfully urge CARB to work with biomethane stakeholders to find a better solution to these concerns, we also note below the implications that the early trigger date for the proposed deliverability requirements could have on biomethane stakeholders. The RNG deliverability requirements are slated to begin in 2041 or 2046 depending on end use, with the potential early trigger advancing the 2041 deliverability requirement for bio-CNG, bio-LNG, and bio-L-CNG pathways for CNG vehicles to apply after December 31, 2037, if the number of unique Class 3-8 ZEVs or NZEVs on December 31, 2029, exceeds 132,000 vehicles.

The early trigger, if reached, would impose unforeseen requirements on businesses and investors who may have already committed to long-term agreements. RNG offtake typically operates on long-term agreements, with contracts frequently spanning 10 years or more. This long-term framework allows for stability and predictability, which are essential to securing investment, ensuring operational viability, and achieving decarbonization goals. It is important to note that many RNG agreements are finalized well in advance of the contract start date, with contracts often signed multiple years prior to the commencement of offtake obligations and multiple years before the project breaks ground. This means that even projects with offtake agreements signed several years before December 31, 2029, could face deliverability requirements that were unforeseen at the time of contracting significant RNG volumes and before an early trigger was determined.



278.7 cont. We respectfully urge CARB to reconsider the necessity of RNG deliverability requirements and to avoid the introduction of an early trigger mechanism. Should CARB not be amendable to this reconsideration, we encourage CARB to incorporate resolution intent language that honors the integrity of long-term offtake agreements finalized on or before December 31, 2029, for exception from the early trigger mechanism. Such language would provide a more certain and transparent timeline for developers, operators, and investors to base critical business decisions upon, while still aligning with the state's broader climate objectives.

• Credit True-up

Oberon strongly supports CARB's proposal to expand the LCFS credit true-up provisions 278.8 to include periods using temporary pathway CIs after annual verification. This is a highly positive change, particularly for projects that operate with conservative, temporary CI scores. By allowing these projects to reconcile their credits based on verified CI data, this helps to protect the financial viability of low carbon fuel projects by allowing them to recover lost value that might otherwise be forfeited due to conservative early reporting. Moreover, it promotes greater accuracy and transparency in the program, ensuring that stakeholders are rewarded based on their true environmental performance. This adjustment ultimately strengthens the LCFS program by fostering a more accurate and equitable system. We commend CARB for recognizing the importance of this adjustment and for taking steps to support the integrity and financial viability of renewable fuel projects. The proposal also includes true-up provisions that adjust credits based on verified operational CIs relative to certified CIs, applying a penalty of four times the spread for shortfalls. However, the justification for this 4X multiplier is unclear, as a smaller multiplier, such as 2X, would still effectively discourage overconfidence in CI analysis.

Recommendations for Future Action

278.9 Oberon encourages CARB to ensure there continues to be a market for low-CI liquid and gaseous fuels as they are a critical 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 sectors (e.g., residential, commercial, industrial, and agricultural stationary applications) 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 substantial volumes of fuels required by industrial, commercial, residential, and agricultural 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 these sectors to support meeting the State's



278.9 cont. substantial and necessary climate targets.

Expanding the LCFS or creating a LCFS-like structure to facilitate the decarbonization of other gasoline-, diesel-, fossil natural gas-, propane-fueled applications in such 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 the vast opportunity for reductions in greenhouse gas emissions in these sectors and drive the continued market development of low carbon fuels such as renewable DME in sectors where their GHG reducing benefits are needed.

Thank you for your time and consideration. Please do not hesitate to contact me at <u>cristin.reno@oberonfuels.com</u> with any questions.

Sincerely,

Cristin Reno Manager, Regulatory Affairs Oberon Fuels





Kevin Barker Senior Manager Energy and Environmental Policy 555 West 5th Street Los Angeles, CA 90013 Tel: (916) 492-4252 KBarker@socalgas.com

October 16, 2024

The Honorable Liane Randolph, Chair California Air Resources Board 1001 I Street Sacramento, CA 95814

Subject: Comments on the California Air Resources Board Proposed 15-Day Amendments to the Low Carbon Fuel Standard

Dear Chair Liane Randolph and Honorable Board Members:

Southern California Gas Company (SoCalGas) values the opportunity to provide feedback on the Proposed 15-Day Amendments (Proposed Amendments) to the Low Carbon Fuel Standard (LCFS). The LCFS has played a critical function in decarbonizing the transportation sector and will continue to foster a cost-effective transition to clean fuels. These clean energy resources will provide a critical complement to electrification in California's quest to achieve carbon neutrality by 2045.

279.1

The Proposed Amendments make important changes to both maintain investments in essential methane capture projects and send a clear signal to transition to zero-emissions fuels. Avoided methane crediting is crucial to finance the initial capital costs of methane capture projects and keep those efforts economically viable.¹ Limiting avoided methane credits would financially undermine existing methane capture projects and discourage new ones. Methane capture projects provide some of the most cost-effective investments the state is making in carbon reductions.² The improved timelines on the avoided methane pathway help make sure that renewable natural gas remains a viable and attractive option for reducing carbon intensity in the transportation sector.

¹ Dairy Cares Comments on May 31 and June 1, 2023, Low Carbon Fuel Standard Virtual Community Meeting. <u>https://ww2.arb.ca.gov/system/files/webform/public_comments/4026/230614%20Dairy%20Cares%20Comments%20on%20LCF</u> <u>S%20Virtual%20Community%20Meetings%20%2800607595xBA8E1%29.pdf</u>

² CARB, California Climate Investments 2022 Mid-Year Data Update, September 2022, indicates that investments in dairy digesters and diverted organic waste cut carbon emissions by approximately \$9 and \$10 per ton, respectively. CARB's 2021 Annual Report on Climate Investments also showed that investments in organic waste to energy were the most cost-effective of the State's climate investments: at 119

- 279.2 Additionally, the improved approach to book-and-claim accounting acknowledges the importance of sustaining existing procurement agreements with out-of-state biomethane projects while simultaneously encouraging in-state production. An uninterrupted flow of biomethane into California fosters its adoption across diverse economic sectors over time. The inclusion of biomethane for use in fuel cells to support electrification will help support both biomethane and the state's transition to zero-emissions vehicles. We recommend that staff also include linear generators as a viable pathway. The modest changes advanced in the use of hydrogen as a feedstock for biomethane policy regime would help fulfill the goals in CARB's 2022 Scoping Plan for the long-term deployment of biomethane for hydrogen production. This approach is crucial for addressing affordability while decarbonizing challenging sectors.
- 279.4 Looking forward, clean fuels will need additional support as LCFS credits phase out. Since California's industrial sector is a significant contributor to natural gas consumption and greenhouse gas emissions, incentivizing biomethane use in sectors beyond transportation becomes crucial. CARB could achieve this by opening the current LCFS program to stationary sources or using the current LCFS program as a model to create a new Industrial Clean Fuel Standard program. This new standard could institute a set of gradually declining emissions-based targets for regulated entities, empowering the industrial sector to reduce emissions through diverse approaches including procuring low and zero-carbon fuels, carbon capture and sequestration, and enhancing energy efficiency.

SoCalGas appreciates the opportunity to offer feedback and collaborate with CARB and stakeholders during the LCFS Program regulatory update.

Respectfully,

/s/ Kevin Barker

Kevin Barker Senior Manager Energy and Environmental Policy



October 16, 2024

Ms. Liane Randolph, Chair California Air Resources Board 1001 | Street Sacramento, CA 95814

Submitted Electronically: https://ww2.arb.ca.gov/lispub/comm/bclist.php

RE: Hyundai's Comments to the California Air Resources Board's Low Carbon Fuel Standard Second 15-Day Changes

Dear Chair Randolph:

Hyundai Motor North America ("Hyundai") appreciates the opportunity to comment on the California Air Resources Board's ("CARB") Low Carbon Fuel Standard's ("LCFS") second 15-day changes that were published on October 1, 2024. We support the environmental goals that California's LCFS program strives to achieve.

Hyundai offers a diverse line up of electric vehicles ("EV") and is committed to initiatives that encourage EV adoption. However, as stated in our previous comment letter (Attachment 1), EVs continue to experience slower adoption rates in the market than anticipated. We believe that the LCFS program as well as complementary incentive programs are necessary to overcome this hurdle.

One area of particular importance is the opportunity for automakers to earn Base Credits for plugin electric vehicles ("PEVs"). Accordingly, we greatly appreciate that this important provision remains in staff's LCFS proposal and urge Board approval of this provision. Automakers are well positioned to efficiently utilize LCFS credit proceeds to accelerate the EV transition. Additionally, we would like to thank you for allowing LCFS credit generation for 80 percent or more renewable hydrogen dispensed for calendar years 2030-2034.

280.3 In closing, Hyundai is aligned with the comments submitted by the Alliance for Automotive Innovation and appreciates CARB's dedication in its continued work revising the LCFS regulation.

Sincerely,

Olabisi Boyle Senior Vice President, Product Planning & Mobility Strategy Hyundai Motor North America

Hyundai Motor America

10550 Talbert Ave Fountain Valley, CA 92708 T + 714 965 3000 F + 714 965 3816 www.hyundai.com

ATTACHMENT 1



August 27, 2024

Ms. Laine Randolph, Chair California Air Resources Board 1001 | Street Sacramento, CA 95814

Submitted Electronically: https://ww2.arb.ca.gov/lispub/comm/bclist.php

RE: Hyundai's Comments to the California Air Resources Board's Low Carbon Fuel Standard 15-Day Changes

Dear Chair Randolph:

Hyundai Motor North America ("Hyundai") appreciates the opportunity to comment on the California Air Resources Board's ("CARB") Low Carbon Fuel Standard's ("LCFS") 15-day changes that were published on August 12, 2024.

Hyundai offers a diverse line up of quality and affordable electric vehicles ("EV") which include battery, plug-in hybrid, hybrid, and fuel-cell electric (both light- and heavy-duty) vehicles. We are committed to innovative initiatives that propel forward the EV transition. For example, we are a proud member of IONNA¹, the joint venture of eight automakers to build out more than 30,000 chargers across the nation. As a key partner in the NorCAL ZERO demonstration project², we deployed 30 heavy-duty XCIENT fuel-cell trucks to support the world's most capable hydrogen refueling station in Oakland. Additionally, we seek to convert drivers to EVs by offering a hands-on experience with EVs through a low-commitment, "try-before-you-buy" subscription program, Evolve+³. We will continue to doggedly pursue innovative solutions to spur EV adoption among early majority buyers.

Hyundai recognizes CARB's hard work and dedication in revamping the LCFS regulation. We greatly appreciate the proposal for automakers to earn Base Credits for plug-in electric vehicles ("PEVs"). Automakers are best positioned to efficiently utilize proceeds to further advance the EV transition as automakers have the most at stake. Additionally, we support the 9% stringency increase in carbon intensity ("CI"), as well as the proposed automatic acceleration mechanism, in hopes these together will increase the LCFS credit prices.

Hyundai Motor America

¹ See <u>ionna.com</u>.

² See Press Release, Hyundai Newsroom, Hyundai Motor Spearheads U.S. Zero-Emission Freight Transportation with NorCAL ZERO Project Launch (March 5, 2024), https://www.hyundai.news/eu/articles/press-releases/norcal-zero-project-launch.html.

³ See Press Release, Hyundai Newsroom, <u>Hyundai Announces Evolve+ EV Subscription Program at the Chicago Auto Show</u> (February 9, 2023), https://www.hyundainews.com/en-us/releases/3763.



However, significant investments are still needed for CARB to meet its environmental goals. California is behind in charging infrastructure to support the quantity of PEVs (aka ZEVs) required by CARB's Advanced Clean Car II (ACC II) regulation⁴ and woefully behind in hydrogen infrastructure for both light-duty and heavy-duty applications⁵. For example, in Southern California, there are no performant heavy-duty stations publicly available. The existing three stations are not a viable option due to limited fuel and station reliability issues. Additionally, PEVs are facing headwinds in the market, resulting in a much slower adoption rate than anticipated. Therefore, significant incentives are needed to rebuild the momentum.

Below are specific requests that we kindly ask you to consider.

- The existing monies that the utilities collected but did not allocate through the Clean Fuel Reward ("CFR") program should be divided among automakers who sold PEVs from the time the program expired, September 1, 2022 until the next iteration of LCFS is implemented next year. Unfortunately, the automakers experienced a lost opportunity during this timeframe that would have otherwise supported EV expansion investments.
- 2. The CFR program has been changed to be used only for medium- and heavy-duty vehicles. We request that proceeds from credits generated from light-duty vehicles be utilized for light-duty vehicles.
- 3. The proposal states that the light-duty fast charging infrastructure ("FCI") program sunsets at the end of 2030. We request that this program be extended to 2035 to align with CARB's ACC II requirement of 100% ZEV sales by 2035 model year.
- 4. We request that the final amendments allow hydrogen-powered fuel-cell electric vehicles ("FCEVs") to receive Base Credits or, at a minimum, Incremental Credits subject to the applicable requirements for PEVs. Like PEVs, these vehicles produce no tailpipe emissions and should receive the same benefits as PEVs.
- 5. We have strong concerns that hydrogen produced using fossil gas feedstock can no longer generate credits starting in 2031. The hydrogen industry is still in its infancy. By removing fossil gas as an allowed feedstock at such an early stage, it may undercut the market's development. While we understand that water electrolysis is the goal, without abundant

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⁴ See <u>CA AB 2127</u> Second Electric Vehicle Charging Infrastructure Assessment (updated March 6, 2024), located at https://www.energy.ca.gov/publications/2024/assembly-bill-2127-second-electric-vehicle-charging-infrastructure-assessment. The assessment states that 1.01 million chargers are needed to support 7.1 million light-duty vehicles by 2030, and 2.11 million chargers to support 15.2 million light-duty vehicles in 2035 to meet California's zero-emission vehicle targets. As of August 26, 2024, the California Energy Commission website shows 105,012 total public and shared private chargers (https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics-collection/electric).

⁵ See <u>CARB Hydrogen Station Network Self-Sufficiency Analysis per Assembly Bill 8</u> (October 2021), located at

https://ww2.arb.ca.gov/sites/default/files/2021-10/hydrogen_self_sufficiency_report.pdf, p. 14 ("With respect to hydrogen, the EO tasks all State agencies to work with other organizations in the private and public sectors to support the development of 200 hydrogen stations by 2025."). Additionally, according to the Hydrogen Fuel Cell Partnership, there are a total of 55 hydrogen stations 18,729 FCEVs in California as of July 3, 2024. See Hydrogen Fuel Cell Partnership, <u>FCEV Sales, FCEB, & Hydrogen Station Data</u> (Numbers as of July 3, 2024), https://h2fcp.org/by_the_numbers.



access to deionized water and more affordable green electricity – which will take considerable time to build out – hydrogen will not be cost-competitive. Meeting diesel Total Cost of Ownership is key to driving fleet adoption. We request that blended feedstock of bio and fossil gas be allowed in 2031 and beyond to generate credits until alternative technologies reach market readiness.

6. Though we are hopeful that the proposed CI standards will appropriately increase credit prices, we strongly encourage CARB to continue its dialogue with hydrogen refueling station operators. The current decline in LCFS credit values caused tremendous hardships on the operators, and this unfortunately resulted in a significant price increase at the pump. Appropriate LCFS credit values are imperative to maintain the affordability of hydrogen and ultimately drive FCEV adoption of all vehicle classes.

In closing, Hyundai appreciates CARB staff's efforts on these amendments. We also support the environmental goals that California's LCFS program strives to achieve. Hyundai is aligned with the comments submitted by the Alliance for Automotive Innovation. We are more than happy to discuss our comments further; please feel free to reach out to Gil Castillo at <u>gcastillo@hmausa.com</u> with any questions. Thank you.

Sincerely,

Jalius Boyle

Olabisi Boyle Senior Vice President, Product Planning & Mobility Strategy Hyundai Motor North America







October 15, 2024

Steve Cliff, Ph.D. Executive Officer California Air Resources Board 1001 | Street Sacramento, CA 95814

Attachment: Comments on the second 15 day notice proposed amendments to the LCFS regulations.

We have been following CARB's approach to the short-lived climate pollutant methane for a number of years. While we are attaching our formal comments on the second round of 15-day amendments to the Low Carbon Fuel Standard, we want to share our overall perspective on your efforts to reduce dairy methane, which we regard as well-intentioned but short-sighted.

281.1 CARB has scrupulously worked to avoid any intimation that the dairy and livestock industries will have to change due to the climate impact of cattle methane and nitrous oxide, or because of the climate impact of cattle feed, or because of the environmental consequences of misusing the land (nitrates in the water, NOx in the air, and eutrophication). Your position is *directly* contrary to climate science. Below we're including a short list of facts about the role of cows in climate change gleaned from a brief survey of recent writings of climate scientists.

- "More than half of all methane emissions from human activities are agricultural exceeding the combined emissions from all oil and gas wells, coal mines, and industrial activities in the world."¹
- "Every four pounds of beef you eat contributes to as much global warming as flying from New York to London."²
- "Beef provides less than 1 percent of calories globally but accounts for 5 percent of greenhouse gas emissions from *all* human activities."³
- "There are 1.7 billion cows on Earth. If you calculate the total biomass of cows and compare it to the total biomass of every remaining wild terrestrial vertebrate left on Earth, the cows outweigh them by more than a factor of ten. We have literally replaced nature with cows."⁴

¹ Rob Jackson, Into the Clear Blue Sky, 2024

² Tad Friend, Can a Burger Help Save Climate Change?, New Yorker, September 23, 2019

³ Jackson, op cit.

⁴ Pat Brown in Jackson, op cit. page 28

- "If all the grain currently fed to livestock in the United States were consumed directly by people, the number of people who could be fed would be nearly 800 million."⁵
 - "We find irrigation of cattle-feed crops to be the greatest consumer of river water in the western United States, implicating beef and dairy consumption as the leading driver of water shortages and fish imperilment in the region."⁶
 - "Of all antibiotics sold in the United States, approximately 80% are sold for use in animal agriculture."⁷
 - "The lowest-carbon meat emits more than the highest-carbon plant protein....The world uses around 4 billion hectares of land to grow food. Simply cutting out beef and lamb (but still keeping dairy cows) would nearly halve our need for global farmland. We'd save 2 billion hectares, which is an area twice the size of the United States. If we were to cut out dairy too, we'd halve this land use again to just over 1 billion hectares."⁸



⁵ Cornell ecologist David Pientel in Jackson, p.30

⁶ B.D. Richter, et al., Water Scarcity and Fish Imperilment Driven by Beef Production," Nature Sustainability 3 (20202): 319-28. Cited in Jackson, p. 33

⁷ M.J. Martin, et al. Antibiotics Overuse in Animal Agricuilture: A Call to Action for Health Care Providers," American Journal of Public Health, 105 (2015): 2409-10. Cited in Jackson, p.33

⁸ Ibid.

281.1 cont.

According to the IPCC no one needs to become vegan in order to begin to put meat and dairy in its proper place.⁹

Demand-side mitigation

GHG mitigation potential of different diets



We believe that you and CARB's staff are well aware of these facts. But we are baffled to see the agency taking actions contrary to what is needed: no regulation of dairy manure emissions, extraordinarily high credit values for "avoided emissions" for up to 30 years, no fuel cell requirements for California dairies producing electricity, no pilot programs for enteric emissions (despite the Legislature having provided \$25 million), no public service announcements as with tobacco, and no incentives for alternatives to meat and dairy in Californians' diets.

It is a profound disappointment for us that some of the striking gains CARB has made in tackling vehicle pollution and emissions have not yet been carried over to agriculture. We understand that CARB would much rather not to be alone in the lead, taking on powerful agricultural interests; but in fact you are arguably the best situated agency in the nation to do so, and it is entirely within your mission.

Hurricanes Helene and Milton and their horrific effects on many thousands of innocent people give us some hope that political calculations may begin to change in regard to climate change and the really very drastic changes we are called on to make. This is an existential opportunity for California to lead once again.

Please see our specific comments on the second 15-day amendments, attached.

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Janet Cox, CEO Climate Action California

Jan Tel Chandles

Daniel Chandler, Ph.D. Steering Committee 350 Humboldt

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Will Brieger Chair, Legislation and Policy Team, 350 Sacramento

⁹ https://www.ipcc.ch/srccl/chapter/chapter-5/5-5-mitigation-options-challenges-and-opportunities/5-5-2-demand-side-mitigation-options/5-5-2-1-mitigation-potential-of-different-diets/figure-5-12/



October 15, 2024

To: California Air Resources Board via email: <u>https://ww2.arb.ca.gov/lispub/comm/bclist.php</u>

From: Daniel Chandler, 350 Humboldt Janet Cox, CEO, Climate Action California Will Brieger, 350 Sacramento

Comments on the second 15 day notice proposed amendments to the LCFS regulations.

Note: We are only submitting comments on a few of the proposed changes, and our comments are labeled as such.

Modifications to Section 95482. Fuels Subject to Regulation.

1. In section 95482(h), staff proposes to require that hydrogen produced using fossil gas as a feedstock will become ineligible for LCFS credit generation beginning January 1, 2035, instead of January 1, 2030. In 2030, hydrogen dispensed as a vehicle fuel would need to be at least 80 percent renewable to match the requirement listed in sections 95486.3(a)(4)(F) and 95486.4(a)(4)(G) for hydrogen refueling infrastructure (HRI) crediting. The proposed change, apparently intended to improve alignment of hydrogen renewable content requirements across the LCFS regulation, better align with the renewable requirements for the electricity grid and give more time for non-fossil hydrogen to scale up and effectively displace fossil hydrogen used in California.

Comment: During the Treasury Department's solicitation of comments for 45V incentives for green hydrogen, multiple informed commenters made clear that goals for electrolytic hydrogen in compliance with the three pillars could be met without compromising requirements.

- Given the national context, we see no justification for CARB to give an "extra" seven years to fossil hydrogen.
- In addition, your reference to non-fossil hydrogen is misguided. Hydrogen made from biomass is neither emissions-free nor even lower emission than combustion of biomass. LCFS program planners should know that LCAs of all woody biomass sources of energy show positive, not negative or neutral, emissions well past the time we need to be at net zero.
- 281.3 2. In section 95482(i), staff proposes to modify the twenty percent crediting eligibility limitation on certain virgin crop-based feedstocks used to produce biomass-based diesel, to include sunflower oil in addition to soybean and canola oils. This means that biomass-based diesel using virgin soybean, canola, or sunflower oil in excess of twenty percent will be assigned the carbon intensity of

281.3 cont. the applicable diesel pool benchmark for that year, or the certified carbon intensity of the applicable fuel pathway; whichever is greater. These limitations are consistent with the rulemaking's objective to provide guardrails on crop-based biofuels to prevent potential adverse impacts. Further, adding sunflower oil is also responsive to public feedback that limiting this provision to soy and canola could lead to incentives to increase use of other oilseeds for biofuel production. The proposed modification also clarifies that this provision applies to the following transaction types: production in California, produced for import, and import. This clarifies that the provision applies to transactions for transportation fuels used by vehicles in California. Additionally, staff proposes to specify that the provision will not apply to any biomass-based diesel pathway certification applications submitted before the effective date of the regulation until January 1, 2028. This adjustment provides appropriate time for existing fuel producers to meet the twenty percent eligibility limitation and adjust their operations and/or feedstock supplies.

Comment: Adding sunflower oil is a significant positive step. But all vegetable seed oils and corn oil — which CARB regards as a residue from production of ethanol—should be included. The original purpose of the LCFS was to correct for the negative externalities of petroleum fuels; yet the program has for the most part ignored the many negative externalities of crop-based fuels. In general, CARB's overall ruling on crop-based biofuels provides far less adequate protection than that of the European Union's Renewable Energy Directive for biofuels, including the Indirect Land Use Change provisions.¹⁰

Modifications to Section 95488.3. Calculation of Fuel Pathway Carbon Intensities.

- 1. **In subsection 95488.3(b),** staff proposes to specify that the "associated data sources" of the CA-GREET 4.0 model referenced are the data sources specified in the CA-GREET4.0 Model Documentation, which is incorporated by reference into the regulation.
- In subsection 95488.3(d)(2), staff proposes to remove the word "crop" in the context of
 feedstocks not listed in Table 6. This clarification ensures that non-crop feedstocks, such as woody
 biomass, may also be assessed by the Executive Officer to determine and assign an appropriate land
 use change value, based upon empirical land cover data, yields, and emission factors.

Comment: Thank you for making woody biomass eligible for land use change assessment.

Modifications to Section 95488.8. Fuel Pathway Application Requirements Applying to All Classifications.

1. In subsection 95488.8(i)(1)(C), staff proposes to remove the word "electrolytic" to clarify that indirect accounting of low-CI electricity used as process energy may be used for hydrogen produced through other production methods besides electrolysis (steam methane reformation, gasification, and more). Staff also proposes to clarify that the matching period is three quarters, consistent with updates to subsection 95488.8(i)(1)(C)(4) in the first 15-day change period.

Comment: Removing "electrolytic" may be consistent with the LCFS general approach—but it is wholly inconsistent with developing a truly green, electrolytic hydrogen industry built on the three pillars.

281.6 2. In subsection 95488.8(i)(2), staff proposes to allow for book-and-claim accounting of biomethane to produce electricity for electric vehicle charging, provided the electricity is generated using a fuel cell. This proposal is apparently intended to increase flexibility for biomethane projects to

¹⁰ https://energy.ec.europa.eu/topics/renewable-energy/bioenergy/biofuels_en

^{281.6} cont. produce low-CI electricity and support California's zero emission vehicle goals, while also prioritizing electricity generated using non-combustion technology.

Comment: The residents near booking dairies will thank you. However, it appears that this provision is not being required of California dairies. There is only one digester using a fuel cell today (according to the CARB *workshop* August 22, 2024). According to LCFS data there are a total of 9 dairies producing electricity in California. Existing dairies should be given two years to switch to fuel cells and using a fuel cell should be a requirement for new pathways. It is hard to imagine you would apply this requirement outside the state and not in the Central Valley which is an air-pollution non-attainment zone.

Modifications to Section 95488.9. Special Circumstances for Fuel Pathway Applications.

- 1. In subsection 95488.9(f)(3)(A), in response to public comment, staff proposes to significantly lengthen the crediting periods for digester-based avoided methane emissions. If a project is certified before the effective date of the regulation, staff proposes that it will be allowed three consecutive 10-year crediting periods. If it is certified on or after the effective date of the regulation and before January 1, 2030, then it will be limited to two consecutive 10-year crediting periods. The Executive Officer may renew crediting periods for fuel pathways that were certified before the effective date of the regulation, for up to three consecutive 10-year crediting periods, as well as fuel pathways representing projects that have broken ground on or after the effective date of the regulation and before January 1, 2030, for up to two consecutive 10-year crediting periods. These provisions maintain the rules for crediting periods described under the current regulation while providing clarity for projects developed between the effective date and January 1, 2030.
 - 2. In subsection 95488.9(f)(3)(B), the existing regulation states that if a 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, comes into effect in California during a project's crediting period, then the project is eligible to continue to receive LCFS credits for those greenhouse gas emission reductions for the remainder of the project's current crediting period, although it may not request any subsequent crediting periods. Staff is proposing to focus this provision on fuel pathways associated with biomethane projects that break ground after December 31, 2029. This proposed change purportedly supports California's SB 1383 methane reduction goals by providing incentive certainty for project developers for methane capture projects.

Comment: Dairy methane from manure needs to be regulated and biomethane should be controlled by market forces if California is to have any chance of meeting our emissions reduction goals. CARB appears to view its primary duty as serving the biomethane industry its previous policies have helped create—rather than reducing methane and nitrous oxide.

Specifically, these provisions:

a. Ignore the fact that only ten years of incentive payments is necessary for dairies using digester
 to break even.¹¹ The other 20 years being proposed is unearned profit. These profits are not

¹¹ *Smith, Aaron.* "Effects of "How Much Should Dairy Farms Get Paid for Trapping Methane?" *Energy Institute Blog, UC Berkeley, October 14, 2024*, <u>https://energyathaas.wordpress.com/2024/10/14/how-much-should-dairy-farms-get-paid-for-trapping-methane/</u>; <u>https://blog.ucsusa.org/jeremy-martin/something-stinks-california-must-end-manure-biomethane-accounting-gimmicks-in-its-low-carbon-fuel-standard/</u>

- 281.7 cont. justified for California dairies, but even less are they justified for all the dairies in states where there are no regulations on dairy methane.
 - b. Ignore the fact that other industries are not paid for reducing their emissions. If, in order to impose regulations on a powerful industry, the state wants to provide incentives that will help dairies reduce emissions in various ways (not just by overfunding digesters) then the incentives should be carefully designed and recognize that the large dairies with the resources to install a digester are profitable enough to absorb many of the costs of mitigation.
 - c. Ignore the fact that digesters favor large dairies. Providing them with the huge profit opportunities inherent in the LCFS puts smaller dairies at an extreme disadvantage.
 - d. Ignore the fact that other methods of manure management from liquid-solid separation to vermifiltration are equally as effective as digesters.¹² Why is CARB fixated on this method? It appears to reflect the influence of the biomethane industry you have created.
 - Ignore the fact that biomethane has supplied nearly one-fifth of the program's total credits despite it being used in less than 1 percent of the state's transportation fleet. Incentivizing dairy biomethane costs California drivers; and by perpetuating diesel engines, it is undermining our goal to electrify transportation.
- 3. In subsection 95488.9(g), staff proposes to clarify that crop or forestry feedstocks are subject to either the specified source feedstock requirements in Section 95488.8(g)(1)(A) or the Sustainability Requirements in 95488.9(g). As an alternative to third-party certification, staff also proposes in subsection 95488.9(g)(1)(B) to allow forestry biomass that is sourced from land harvested and managed according to the sustainable forestry management practices included in CARB's US Forest Offset Protocol.

Comment: It is worth remembering that "As of 2022, global fossil fuel combustion and industrial processes account for approximately 90% of these [GHG] emissions, whereas land-use change, primarily deforestation, accounts for approximately 10%."¹³ That is a very large amount of carbon that has to be re-sequestered. The CARB US Forest Offset Protocol has been criticized recently for a number of apparent loopholes. Our concern is more central: Trees are only required to be left to grow for one hundred years, which the regulations ironically term "permanent." One hundred years is one 20th the lifespan of many redwoods. If we want to regrow our redwood forests, they need to be 500 to 700 years old to be "mature" and capture the maximum amount of carbon. We don't usually think beyond next year or the next election cycle, but climate change works on a different time scale. CO2 remains in the atmosphere for 300 to 1,000 years.¹⁴ We are going to need the carbon sequestration of these trees at least as long as the CO2 we are emitting (at undiminished pace) stays in the atmosphere. So neither option suggested by staff even begins to be adequate. In addition, since these insufficient sequestration

¹² Aguirre-Villegas, Horacio A., Rebecca A. Larson, and Mahmoud A. Sharara. "Anaerobic digestion, solidliquid separation, and drying of dairy manure: Measuring constituents and modeling emission." *Science of the total environment* 696 (2019): 134059. Miito, Gilbert J., Femi Alege, Joe Harrison, and Pius Ndegwa. *Influence of earthworm population density on the performance of vermifiltration for treating liquid dairy manure*. 2024.

¹³ Ripple, William J., Christopher Wolf, Jillian W. Gregg, Johan Rockström, Michael E. Mann, Naomi Oreskes, Timothy M. Lenton et al. "The 2024 state of the climate report: Perilous times on planet Earth." *BioScience* (2024): biae087.

¹⁴ https://science.nasa.gov/earth/climate-change/greenhouse-gases/the-atmosphere-getting-a-handle-on-carbon-dioxide/

- 281.8 cont. projects are in essence traded for CO2 emissions, all such transactions perpetrate a fraud on the public and the environment.
- 4. In subsection 95488.9(g)(7)(H), staff proposes to add an additional basis for adjusting certifications. The addition specifies that CARB may modify certifications if appropriate for consistency with the removal or suspension of certification systems in other programs such as the European Union Renewable Energy Directive, or Environment and Climate Change Canada's Clean Fuels Regulations.

Comment: A good idea.



COMMENTS OF HIF USA ON California Air Resources Board Second Notice of Public Availability of Modified Text Proposed Low Carbon Fuel Standard Amendments

OCTOBER 16, 2024

Highly Innovative Fuels USA (HIF USA) appreciates the opportunity to offer comments in response to the California Air Resources Board's (CARB or the Board) Second 15-day Notice of Public Availability (the Second 15-day Notice) of modified text for the proposed Low Carbon Fuel Standard (LCFS) amendments, which was posted for comment on October 1, 2024.

As we have previously explained, 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 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, participating in the September 28, 2023 hearing and April 10, 2024 workshop, and submitting comments in response to the April 2024 workshop and the First 15-day Notice of Public Availability of modified text for the LCFS amendments posted on August 12, 2024 (the First 15-day Notice).

HIF USA has reviewed the Second 15-day Notice and observes that, as in the First 15-day Notice, CARB does not in any way address the two key points made in our previous submittals. Because these two issues are important for diversifying California's transportation fuel supply and for encouraging the proliferation of low-carbon eFuels for a variety of transportation modes, we reiterate them here and incorporate our previous comments by reference.¹

282.1 I. CARB Should Propose Narrow Amendments to the LCFS to Include Low-CI Methanol as an Opt-In Fuel.

We acknowledge that CARB has not proposed in the current LCFS amendment process to include low carbon intensity (CI) methanol (also referred to as "green methanol") as an opt-in fuel, as we and other stakeholders have previously suggested.

Specifically, we urge CARB staff to propose targeted changes to 17 C.C.R. § 95482 to make low-CI methanol eligible for crediting as an opt-in fuel when sold for use in marine and other specialty

¹ See Comment 17 for Public Meeting to Hear an Update on the Low Carbon Fuel Standard (Sept. 28, 2023), available <u>here</u> (HIF USA pre-proposal comments to CARB Board requesting inclusion of low-CI methanol as an opt-in fuel in the LCFS regulations); Comment 389 for Proposed Low Carbon Fuel Standard Amendments (Feb. 20, 2024) at 2, available <u>here</u> (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)) (hereinafter, "HIF USA 45-Day Comments"); Comments of HIF USA on Low Carbon Fuel Standard Public Workshop - April 10, 2024 (May 9, 2024), available <u>here</u>; Comments of HIF USA on First 15-day Notice (Aug. 26, 2024), available <u>here</u>.



282.1 cont. transportation applications such as direct methanol fuel cells. As HIF USA has explained in its previous submittals, amending the LCFS regulations to include green methanol as an opt-in fuel would create another opportunity for CARB to incentivize low-CI fuels in hard-to-decarbonize sectors. Low-CI methanol has significant potential as a drop-in fuel to alleviate emission impacts on port-adjacent communicates in the near term and requires limited regulatory incentives to accelerated adoption.

CARB indicated its willingness to make this change at the beginning of its process to update the LCFS. In a July 2022 LCFS workshop presentation, 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.² Yet, its proposed regulatory amendments released in December 2023 did not include this proposed change, nor did CARB include this change in the First or Second 15-Day Notices, despite recommendations from multiple entities that it do so.³

In comments submitted after the April 2024 workshop, HIF USA offered to support CARB's efforts to obtain whatever data is needed to support inclusion of green methanol as an opt-in fuel. We reiterate our readiness to assist CARB in obtaining this data, as we believe it is critical to move forward with including low-CI methanol as an LCFS opt-in fuel. The benefits of low-CI methanol in marine applications more than justifies a regulatory amendment to make this change, and we stand ready to support CARB staff in developing a proposal to make it a reality.

II. Book and Claim Accounting Should Be Preserved for Low-CI Electricity Used to Produce Hydrogen as an Input to E-Fuels.

The Second 15-Notice still does not address HIF USA's and other commenters' concerns that the proposed changes to the regulatory text in 17 C.C.R. § 95488.8(i)(1)(A) appear to eliminate bookand-claim accounting for low-CI electricity used to produce electrolytic hydrogen as an input for eFuels. As commenters noted during the April 10, 2024 workshop,⁴ and as HIF USA has explained in its previous submittals, CARB's proposed changes to this provision, if finalized, would negatively impact the commercial availability of low-CI eFuels in the California transportation fuel market.

CARB has not explained in this rulemaking process the rationale for the proposed change, other than brief comments at the April 10 workshop, in which a CARB representative indicated that the change may reflect CARB's interest in prioritizing the production of hydrogen as a primary transportation fuel rather than as a process input. HIF USA does not believe that elimination of the current bookand-claim allowance for hydrogen produced by electrolysis for transportation purposes is necessary to incentivize the production and use of hydrogen as a transportation fuel—as these two uses of hydrogen are complimentary and not mutually exclusive. In any event, because CARB proposes a significant change to the current regulations, it is obligated to provide a rationale and address the comments provided on this issue.

² See CARB, "Public Workshop to Discuss Potential Changes to the Low Carbon Fuel Standard," "CARB Presentation" at Slide 31 (July 7, 2022), available <u>here</u>.

³ See, e.g., Comments of the Methanol Institute on Low Carbon Fuel Standard Public Workshop - April 10, 2024 (April 11, 2024), available <u>here</u>.

⁴ CARB, Workshop Recording, Low Carbon Fuel Standard Public Workshop - April 10, 2024, available <u>here</u> 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).



282.2 cont. In sum, we urge CARB to refrain from finalizing any changes to 17 C.C.R. § 95488.8(i)(1)(A) that would preclude the continued use of book-and-claim accounting for low-CI electricity used for hydrogen production through electrolysis as a process step for eFuels. We reiterate our request that CARB review and consider our submittal on this topic in response to the 45-day proposed rule.⁵

#

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

⁵ See HIF USA 45-Day Comments at 2-4.

October 16, 2024

Via Email

Rajinder Sahota, Deputy Executive Officer, Climate Change & Research Edie Chang, Deputy Executive Officer, Planning, Freight & Toxics Matt Botill, Chief, Industrial Strategies Division California Air Resources Board 1001 I Street, Sacramento, CA 95814

Re: Methanol as Opt-In Fuel for LCFS

Dear Ms. Sahota, Ms. Chang, and Mr. Botill:

283.1 On behalf of the undersigned representatives of the methanol-as-marine-fuel supply chain, we thank you for convening a meeting with key stakeholders on September 26, 2024, to explore the opportunity methanol presents as a marine fuel in the near term to reduce greenhouse gas emissions and to reduce air toxics and criteria pollutant emissions at California ports and in the areas surrounding the ports. Thanks to you and the other CARB staff present for your thoughtful engagement and questions.

As you know, several parties have been advocating in the most recent rulemaking for the Board to make minor amendments to the LCFS regulatory language that would allow lowcarbon intensity ("low-CI") methanol to generate LCFS credits when used in marine operations. There is interest in this opportunity to decarbonize and reduce emissions in underserved areas because the necessary infrastructure exists currently. In other words, a transition to low-CI marine methanol could be a near-term "plug and play" option that is not available with other potential fuels. And of course, with hundreds of millions of gallons of diesel fuel being used in marine operations in California now, it is important to have as many options available to come online as quickly as possible. While many fuels will have a role in decarbonizing the ports, the need for liquid fuels will continue to exist, and with current air quality challenges, obtaining reductions quickly will benefit the communities that currently live nearby the operations of what is agreed to be a hard-to-decarbonize sector.

During our September 26 meeting, you heard from the full range of the supply chain stakeholders that would be needed to make marine methanol fuel a reality at the Ports of Los Angeles and Long Beach. Specifically, we highlighted that in 2018 over 57,000 barrels per day of marine fuel was sold in these two ports, approximately 80% of which was residual bunker fuel (approximately 46,000 barrels per day). In addition to the heavy air toxics and criteria pollutant loading, this equates to 11.7 million tonnes of greenhouse gases annually. From an air toxics perspective, we shared a recent presentation from the South Coast Air Quality Management District (SCAQMD), which shows dramatic improvements in health risk in the South Coast region from 2012 to 2018, but, while improved, due to diesel emissions, the ports remain challenged.

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We understand that the Board is about to complete the currently pending LCFS rulemaking amendments. While CARB staff suggested during the early stages of the current rulemaking that marine methanol was being considered for inclusion as an LCFS opt-in fuel, this change is not included in the proposal under consideration for adoption later this year. As we explained, while it is a proven technology and could essentially operate as a drop in fuel to replace diesel, some investment is required to bring marine methanol and its many benefits to California ports. The economics require incentives from responsible regulatory bodies like CARB. The ability to generate LCFS credits as an opt-in fuel would serve as an important incentive.

The Ports of Los Angeles and Long Beach support this amendment. We urge the staff and the Board to make this a reality. With proper regulatory signals, the ports and the people who live near them could experience health and welfare benefits in the near term and of course, there would be significant emissions reductions from a climate change perspective as well.

In sum, adding regulatory language to the LCFS that allows credit generation for low-CI marine methanol would be consistent with California's first-mover history in policies to accelerate decarbonization, fully align with the Board's environmental justice initiatives to improve air quality right away in and near the ports, support California's efforts and requirements to achieve increasingly stringent national ambient air quality standards for particulate matter and sulfur dioxide, support achieving the Scoping Plan's 85% 2045 greenhouse gas reduction target, and dramatically reduce diesel use in the ports.

We hope that the Board's resolution adopting the currently proposed LCFS amendments will include direction to staff to pursue in short-order methanol as an approved opt-in fuel for the LCFS program under Section 95482. We believe this could be a first step toward broader inclusion of e-fuels, including low-CI methanol. For now, the benefits of low-CI methanol in marine applications, on their own, more than justify a regulatory amendment. Direction from the Board would be helpful in ensuring that staff can devote resources to pursuing this type of amendment and would signal the Board's support for low-CI methanol as a commercially viable alternative to diesel fuel. For example, the Board could include the following type of finding:
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283.1 cont.

"Communities living near ports in California bear a disproportionate impact of emissions from port activities, which include not only onhighway equipment but also ocean going and other port vessels, which have historically been hard to decarbonize due to their operations.

"Low-Carbon Intensity (CI) Methanol has significant potential as a drop-in fuel to alleviate impacts on communities in the near term.

"Low-CI Methanol could largely function as a drop-in fuel at ports.

"Low-CI Methanol requires limited regulatory incentives to accelerate adoption.

"Regulatory amendments providing the ability to generate credits for use of methanol as an opt-in fuel in marine application under the LCFS would promote Low-CI Methanol for the marine vessel sources.

"CARB staff are directed to evaluate and bring to the Board for consideration regulatory amendments that would promote the use of Low-CI Methanol in marine applications."

We hope the above is helpful to you as you consider the best next steps for reducing emissions at California's ports and working to decarbonize marine sector transportation. We understand that the Ports of Los Angeles and Long Beach are writing separately on this issue, so that they may speak both to the use of low-CI methanol as a drop-in fuel and their efforts related to the Green Shipping Corridor that they discussed in the meeting. We also understand that Centerline Logistics is preparing a separate letter to address specifics related to the items discussed during the meeting.

If you have any additional questions, please feel free to contact any of the signatories below.

Sincerely,

Brooke Vandygriff, HIF USA LLC Shannon S. Broome, Hunton Andrews Kurth LLP, Counsel to HIF USA Stefan Unnasch, President, Lifecycle Associates, for HIF USA Michael Lacavera, Vopak Luke Nguyen, Idemitsu Apollo Corporation Alexander Döll, Methanol Institute

COMMENTS OF STEVE BERRY & TIM SEARCHINGER REGARDING SECOND 15-DAY RULE MODIFICATION OF TO LOW CARBON FUEL STANDARD (October 16, 2024)

Steven Berry, David Swenson Professor of Economics, Yale University (<u>steven.berry@yale.edu</u>) Timothy D. Searchinger, Senior Research Scholar, Princeton University (<u>tsearchi@princeton.edu</u>)

We are an economist at Yale University and an environmental scientist at Princeton University and have written papers analyzing the emissions from biofuel use as well as economic land use models. We have previously submitted comments on the proposed amendments to the LCFS, to the first 15-day amendment, and to the draft Environmental Impact Statement.

284.1 We have previously explained why the incentives provided by the LCFS for cropbased biofuels, including biomass-based diesel, lack an underlying scientific basis. Our comments have also explained how these biofuels are contributing to global deforestation and other land use changes and why properly evaluated, they are increasing greenhouse gas emissions. These comments still hold. For this reason, the proposed "cap" on biomassbased diesel from vegetable oil is inadequate:

- The new amendments extend the cap to sunflower oil but not to other biomassbased fuels from other possible vegetable oils including those from corn oil. As we have discussed, vegetable oil prices move globally and across different vegetable oils in harmony. This means that the ILUC from all should be similar. If corn oil is used for biofuels, it will be replaced by roughly the same mix of vegetable oils globally as if any other vegetable oil is used. Accordingly, the "cap" should be extended to all biofuels from virgin vegetable oil.
- The new amendments continue to assign large greenhouse gas reductions to biofuels over the cap because they are assigned the benchmark rate. This means, for example, that biomass-based diesels from soybean oil will be credited with achieving roughly a 28% reduction relative to diesel in 2030 and will have the same reduction as if they were uncapped by 2040. This "cap" therefore has limited effect. Biomassbased diesels in excess of the cap should be assigned the ULSD.
- It is unclear to us if the "cap" applies to biomass-based diesels used in aviation. If it does not, this lacks justification. The potential implications of CARB encouraging vegetable oils for aviation are highly significant. For example, if even just 25% of expected aviation fuel in 2050 were to derive from vegetable oils, that would require roughly 40% of global cropland. The cap should therefore apply to all liquid fuels for aviation.

October 16, 2024

Chair Liane Randolph & Members of the Board California Air Resources Board 1001 I Street Sacramento, CA 95814

Via electronic submission

Re: Second 15-Day Changes to the Proposed Regulation Order

Dear Chair Randolph and Members of the California Air Resources Board:

The Michigan Soybean Association appreciates the opportunity to comment on the proposed modifications (Second 15-Day Changes) to the Low Carbon Fuel Standard (LCFS) program. ASA has welcomed engagement with the California Air Resources Board (CARB) and staff throughout this multi-year process to update the LCFS program.

The Michigan Soybean Association (MSA) is a membership organization which represents Michigan soybean producers' interests at the state and national levels by voicing the needs and concerns before governmental agencies and the general public through advocacy and legislation.

285.1 CARB's Second 15-Day Changes to revise the LCFS did not address our major concerns with provisions included in the August 15-day notice nor did it provide additional clarification or detail related to sustainability reporting requirements for agricultural feedstocks. We do appreciate the additional flexibility related to virgin vegetable oil feedstock limitations, by extending the compliance deadline to January 1, 2028, for all approved pathways at the date of adoption.
285.4 However, additional feedstock limitations included in the Second 15-Day Changes document could further limit soybean oil market share in California, when compared to the August proposal.

285.5 In addition to the new proposals in the Second 15-Day Changes package, Michigan Soybean Association remains deeply concerned with the drastic pivot CARB has made in the past few months related to agricultural feedstocks used for biofuels. We continue to encourage that updates to the LCFS program are based on science, as required by AB-32.

Amended Feedstock Cap Considerations

The Michigan Soybean Association has significant concerns with the virgin vegetable oil feedstock cap that was included in the initial 15-Day Changes posted in August, especially after
CARB itself noted that a cap will increase the utilization of petroleum diesel. The current proposal limits, or caps, the amount of soybean oil that is allowed to generate credits in the program at an arbitrary 20%. Now, CARB is expanding on this cap in its Second 15-Day Changes with the

285.6	inclusion of sunflower oil. Adding additional feedstocks to the 20% aggregate cap will further limit market access for soybean oil and additional gallons of low-carbon fuels.
285.7	Based on CARB's own analysis, a cap on credit generation for vegetable oil feedstocks will lead to an increase in fossil diesel use compared to the status quo. The Michigan Soybean Association agrees that all feedstocks entering the California LCFS market should maintain fidelity to the assumptions underlying their life-cycle assessment (LCA), domestic agricultural feedstocks are facing a redundant, triple penalty through an outdated indirect land use change (ILUC) score, stringent sustainability reporting requirements, and a proposed arbitrary cap on credit generation while all other feedstocks, including imports, do not face the same restrictions.
285.8	The proposed cap increases soy's carbon intensity (CI) score for amounts over the cap from the established pathway, which is based on science, to the benchmark CI, which is not based on an LCA for soy. This is effectively increasing soy's ILUC score by upwards of 50% for many pathways without a scientific basis. In fact, CARB has refused to use new data related to ILUC while at the same time effectively increasing it by an arbitrary amount.
285.9	The increase in ILUC for ag feedstocks above the 20% threshold will effectively shut them out of the LCFS. Biomass-based diesel provides GHG and emissions benefits that are unpriced by the market. As a result, they cost more to produce than they can be sold for and rely on policy to account for these benefits. Without the credit generation, soy will not be able to compete against waste feedstock imports, thereby capping use in the LCFS.
285.10	North American agricultural feedstocks for biofuel production are already held to a high standard for participation in the Renewable Fuel Standard (RFS) and the Canadian Clean Fuels Regulations. Rather than adding additional sustainable North American feedstocks to its arbitrary
285.11	proposed cap, CARB should consider updating carbon intensity analysis and oversight of imported feedstocks, which are not held to the same level of accountability.
285.12	While the Michigan Soybean Association is steadfast in its opposition to the virgin vegetable oil feedstock cap and the rationale used to reach this conclusion, the Second 15-Day Changes added some additional flexibility to come into compliance with the arbitrary cap. We appreciate CARB's acknowledgement that biofuel production facilities cannot shift production overnight, and thank CARB for updating the grandfathering clause to provide a 2028 compliance date for all approved pathways in the LCFS program.
	Carbon Intensity Scoring and Auto Acceleration Mechanism
	The Michigan Sovhean Association remains concerned that without a comprehensive update to

The Michigan Soybean Association remains concerned that without a comprehensive update to the Global Trade Analysis Project model for biofuels (GTAP-BIO) that CARB utilizes, soy-based feedstocks will be phased out of the LCFS even without the additional limitations being proposed in the Second 15-Day Changes. Current data indicates a much lower CI score for soybeans, as growers continue to improve soil practices, limit water use, lower on-farm emissions and more. On the one hand, CARB is recommending stringent sustainability guardrails for U.S. soy, but on

the other hand is still on track to likely phase-out soy-based biofuels from credit generation by approximately 2035 or sooner.

285.13 cont.

285 17

As CARB looks to develop a more aggressive auto acceleration mechanism to reach CI reduction benchmarks sooner, using outdated methodologies will only limit the output of actual improvement over time in terms of emissions reductions. As CARB updates all other major lifecycle emissions models through this rulemaking, we once again urge action to update the GTAP-BIO model so that the most current, science-based data may be used to determine carbon intensity reductions.

285.14 In terms of updating the timeline for analysis of data to trigger the auto acceleration mechanism, the Michigan Soybean Association appreciates that CARB is seeking to provide additional notice to the market before a trigger is implemented through the ability to analyze data quarter over quarter rather than just annually. This will allow the industry more time to plan and make business decisions ahead of new benchmarks triggering.

Sustainability Guardrails and Traceability Concerns

 285.15
The Michigan Soybean Association remains very concerned about the sustainability guardrails. The sustainability guardrails are more onerous than the specified source requirements used for waste feedstock imports. Palm oil in Southeast Asia has had forced labor concerns¹, but CARB does not require used cooking oil derived from palm to track social or economic sustainability. Concerningly, petroleum also does not have to track these criteria. CARB's proposal makes it administratively easier to use non-sustainable petroleum² in the state than biofuels that have lower CI scores and are produced from sustainable feedstocks grown in the United States. Land use change is already captured in the ILUC score, which makes it unclear what purpose the guardrails serve.

The Second 15-Day Changes offered a bit more detail about how CARB plans to implement its reporting and requirements in terms of traceability, but we continue to have serious concerns about how this proposal will work in practice. By way of background, soybean products pass through many hands before final use. A soybean is produced, potentially transported to a grain elevator, then must reach a soybean processor to be separated into soybean oil and soybean meal (crushed). The meal and oil can then be delivered to end users. Because of this, ensuring the identity preservation of a soybean is not easily accomplished. Soybeans are a bulk commodity, and infrastructure in the U.S. was not developed to segregate subunits of the crop. This bulk handling system based on comingling is one of the inherent advantages the United States has as it reduces transportation costs, and subsequently on-ground emissions.

¹ https://apnews.com/article/virus-outbreak-only-on-ap-indonesia-financial-markets-malaysia-7b634596270cc6aa7578a062a30423bb

² https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2022.858512/full

CARB's proposal states that farmers will have to declare the geographical shapefiles or coordinates of farm boundaries starting in 2026. This raises many issues including the definition of a farm and how grain must be traced and reported if harvested from several fields but comingled at storage. While the deforestation requirements do not start until 2028, the questions posed above are relevant for the attestations starting in 2026. At that point, farmers will have to declare the boundaries of their farm. CARB settling on one definition for 2026 and another for 2028 would create much confusion. Educational efforts will be needed ahead of 2026. Once farmers understand the program, it will be very difficult to change fundamental definitions.

While 2026 may seem like plenty of time, it is much less for farmers in practice. Soybeans available starting at the beginning of 2026 are from the crop harvested in the fall of 2025 and planted in the spring of 2025. Farmers are purchasing inputs for that crop currently. If delivery points for the next soybean crop require data disclosure, producers need to know that now as they plan out their upcoming crops and lock in investments. So, if new LCFS regulations are not finalized until January 2025 and planting begins in March 2025, it leaves virtually no planning time for a farmer to update practices to adhere to these new attestation requirements.

If CARB insists on agricultural feedstock traceability, then it should reward sustainable practices beyond what is already assumed in the LCA. For instance, some soybeans are double cropped meaning they are grown as a secondary crop following a primary crop within a growing season. They are not displacing other crops or land uses. Double-crop soybeans should be eligible to have the ILUC component of the CI score removed, or at least shared with the other crop in the rotation.

Entities Eligible to Apply for Fuel Pathways

The Michigan Soybean Association is concerned about CARB's proposal to give the Executive Officer the discretion to stop accepting new pathways for biomass-based diesel starting in 2031. We do not understand how this benefits the LCFS. Under AB-32, CARB must under statute minimize costs and maximize GHG reductions. It is unclear how this is served by rejecting new pathways. In fact, the LCFS is best served by allowing the most available pathways. If these pathways cannot achieve cost-effective GHG savings, they will not be utilized by the market in the LCFS. In essence, an increase in pathways can only serve to improve GHG benefits in California. Singling out a single fuel for prejudicial treatment is baffling given the goals of the LCFS and the authority that establishes it.

Recommendations to CARB

285.18

As CARB finalizes its update to the LCFS, the Michigan Soybean Association aligns itself with the American Soybean Association (ASA) recommendations that will likely prevent an increase in fossil diesel use, improve carbon intensity calculations, and improve market access for sustainable agricultural feedstock providers. First, CARB should not apply the vegetable oil feedstock cap proposal to North American feedstocks. As noted above, these feedstocks are already subject to guardrails to ensure production on land that has not been converted since 2008. The RFS was designed specifically to prevent land conversion for biofuel production, and U.S. Department of Agriculture (USDA) data shows a decrease in farmland over the same period.

Second, CARB should convene an expert working group to consider issues related to the sustainability provisions and indirect land use change. CARB has utilized working groups in the past to analyze complex issues related to the LCFS and this is no different. Through meetings with CARB staff and board members, decisions are being made using competing schools of thought. Gathering experts to coalesce around an agreed upon science-based approach moving forward would ensure that CARB is utilizing the best information available. We recommend that this expert working group convenes in 2025 and provide recommendations by October 2026.

285.24 Lastly, CARB must undertake a comprehensive update of the GTAP-BIO model for soybean oil used in biofuel production. Without using the most up-to-date and accurate data, CARB is doing a disservice to the feedstock producers and California's citizens by calculating carbon intensity scores not rooted in current fact. Through CARB's own analysis we know that basing decisions off old data will lead to more—not less—emissions in the California transportation sector.

Conclusion

- 285.25 The Michigan Soybean Association is encouraged by the continued successes of programs that support the development of cleaner, low-carbon fuels. However, it is critical that CARB finalizes updates in a way that does not arbitrarily exclude agricultural feedstocks through policies that are not science-based and run afoul of CARB's mandate, including capping vegetable oil feedstocks and applying onerous sustainability guardrails that add cost without rewarding farming practices that lower CI.
- 285.27 CARB's Second 15-Day Changes did not address any of the fundamental issues raised by soybean farmers in the first 15-Day Changes and fails to acknowledge the potential unintentional consequences of a feedstock outlined by its own employees only a few months before. CARB is required under the law to achieve the maximum technically feasible and cost-effective reductions in GHGs. The two most recent 15-Day Changes show a lack of willingness to achieve the statutory obligations set forth in AB-32.

The Michigan Soybean Association is eager to continue working with CARB to support the role of agriculture in diversifying the fuel supply while reducing GHGs and increasing clean air 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,

Ber C Etyp

Ben Steyer Michigan Soybean Association CEO



October 16, 2024

California Air Resources Board 1001 I Street Sacramento, CA 95814 *Via electronic submission:* <u>https://ww2.arb.ca.gov/lispub/comm/bclist.php</u>

Re: Second Notice of Public Availability of Modified Text and Availability of Additional Documents and/or Information: Proposed Low Carbon Fuel Standard Amendments

To Whom it May Concern:

286.1

286.2

Sustainable Advanced Biofuel Refiners (SABR) Coalition appreciates the opportunity to comment on the California Air Resources Board's (CARB) proposed changes to the Low Carbon Fuel Standard (LCFS) program – Second 15-Day Changes. SABR is a national biodiesel trade association made up of nearly sixty organizational members from virtually every state including California. SABR's members have invested in building out America's first advanced biofuel and include stakeholders from every link in the value chain from feedstock growers to biodiesel producers, distributors, retailers, and consumers, as well as infrastructure and products and services suppliers. Biodiesel can be produced from a range of feedstocks, including oil from numerous oilseed crops, such as soybeans, canola, and sunflowers. Members of SABR Coalition have participated in the LCFS program, including obtaining pathways for biodiesel. SABR

SABR Coalition submitted comments on the First 15-Day Changes, which first proposed a 20% limit on credits for biomass-based diesel (e.g., biodiesel) produced from virgin soybean oil and canola oil.¹ Under the proposal, any biomass-based diesel from virgin soybean and canola oil in excess of 20% will be assessed the carbon intensity of the applicable diesel pool benchmark for the year or the certified carbon intensity of the applicable fuel pathway, whichever is higher. Rather than address the numerous concerns raised by public comments as to the lack of support and detrimental impacts of such a proposal, the Second 15-Day Changes would expand these provisions to biomass-based diesel from virgin soybean, canola, and sunflower oil. The only explanation provided is that it is consistent with the rulemaking's objective to provide guardrails on crop-based biofuels to prevent potential adverse impacts and that adding sunflower oil responds to feedback that limiting this provision to soy and canola could lead to incentives to increase use of other oilseeds for biofuel production. But, the "price premium may make it prohibitive to use sunflower oil in biodiesel."² This illustrates, as SABR Coalition argued in its comments, the lack of empirical evidence that the proposed limitation is necessary or warranted.

¹ SABR Coalition also supported the comments of the American Soybean Association and NATSO/SIGMA.

² National Sunflower Association, *Biodiesel*, <u>https://www.sunflowernsa.com/oil/biodiesel/</u> (last visited Oct. 13, 2024).

I. Limitations on Crop-Based Feedstocks for Biodiesel are Unwarranted.

The Initial Statement of Reasons (p. 32) simply states that guardrails are needed to "reduce the risk that rapid expansion of biofuel production and biofuel feedstock demand could result in deforestation or adverse land use change." CARB does not explain how these guardrails would operate, and land use changes are already considered in setting the carbon intensity scores, which disadvantages crop-based biodiesel under the LCFS. Citing to no real world data to explain this claimed "risk," additional guardrails are simply not warranted.

A. There is no support to impose limitations on credits for crop-based biodiesel, much less to expand those limitations to other feedstocks.

The Second 15-Day Changes continue to illustrate that CARB's proposal is not grounded in reality. As noted above, the proposed addition of sunflower oil to the feedstocks limited in the proposal does not appear to consider actual market conditions that essentially prices sunflower oil out of the biomass-based diesel market. Indeed, despite the substantial growth in biodiesel and renewable diesel production, sunflower oil has not been included (or, to our knowledge) sought to be added as an eligible feedstock under the U.S. Renewable Fuel Standard, even though there are benefits to ensuring a diversity of feedstocks to support production.

It is unclear what support CARB is relying on to add sunflower oil, although several comments argued for a broader and more stringent limitation on biomass-based diesel volumes. These comments fail to understand the difference between biofuel feedstocks (including waste oils) and the vegetable oil market and cherry pick and misstate data to argue the LCFS will impact global demand. For example, soybeans are approximately 20% oil and 80% protein meal, and meal represents a significant source of demand for soybeans, which is largely ignored. U.S. farmers have also been able to meet increasing demand since the increase in biofuel production with the U.S. Renewable Fuel Standard. While there was a recent increase in soybean prices that some have attributed to the increased demand from renewable diesel facilities, this ignores other factors contributing to these prices that were unrelated to biofuel production and that prices have been trending down since that spike in prices.³ Nevertheless, there has been significant investments for increased U.S. capacity in crushing to meet anticipated demand, and there were record high crushes in 2024.⁴ Soybean yields and production are also forecast at record highs.⁵ And, export demand for U.S. soybeans has been below previously anticipated levels.⁶ Biodiesel has long been a market for surplus soybean oil, and there is no basis to impose such limits on biodiesel, which is discussed further below.

More important, CARB already rejected a similar recommendation from the Environmental Justice Advisory Committee (EJAC), finding that modeling of a scenario implementing their

⁴ USDA, Oil Crops Outlook: September 2024, at 2 (Sept. 16, 2024),

286.3

³ Soybean Prices – 45 Year Historical Chart, Macrotrends, <u>https://www.macrotrends.net/2531/soybean-prices-historical-chart-data#google_vignette</u> (data as of Oct. 16, 2024).

https://www.ers.usda.gov/webdocs/outlooks/110006/ocs-24i.pdf?v=3360.1.

⁵ *Id.* at 1; *see also* USDA Report Projects Record 2024 Corn and Soybean Yields, Morning AgClips, Aug. 20, 2024, <u>https://www.morningagclips.com/usda-report-projects-record-2024-corn-and-soybean-yields/</u>.

⁶ Karen Braun, *Recent strength in US soy sales not enough to lift export prospects*, Reuters, Sept. 20, 2024, <u>https://www.reuters.com/markets/commodities/recent-strength-us-soy-sales-not-enough-lift-export-prospects-2024-09-20/</u>.

- 286.3 recommendations would result "in higher volumes of fossil diesel being used than any of the other scenarios evaluated."⁷ Limiting the volumes would result in insufficient credits, increase costs, increase air emissions, decrease GHG emissions reductions, and decrease health benefits.⁸ CARB has properly rejected such calls and must continue to do so.
- 286.4

B. Imposing limitations on crop-based biodiesel would have detrimental environmental impacts rather than provide any guardrails against the concerns claimed by CARB.

While CARB rejected the arbitrary restrictions on biomass-based diesel volumes in the Second 15-Day Changes that other commenters suggested, it continues to propose a 20% limitation on certain crop-based biomass-based diesel fuels and would now expand it to include soybean oil, canola oil, and sunflower oil. Where biodiesel has long been an important outlet for supplies of excess vegetable oils, particularly soybean oil and canola oil, these limitations would have detrimental impacts on farmers. An important benefit of having this additional market is to improve the farmer's economics, which allows farmers to invest in sustainable practices and to better protect their farms from other land use pressures, including expansion of urban areas with their attendant pollution issues.⁹ Based on the most recent Census of Agriculture, "[t]he amount of farmland and number of farms in the U.S. continue to decline."¹⁰ In the meantime, use of conservation practices are increasing.¹¹ As SABR Coalition's prior comments explained, U.S. soybean farmers continue to adopt precision agricultural technologies and practices that increase productivity and yield, enhance resilience to environmental changes, and reduce GHG emissions.¹² These sustainable practices provide GHG emission reductions benefits that will be lost if crop-based fuels are unduly limited. Restricting this markets through regulation sends the

⁷ Initial Statement of Reasons at 116; *see also* CARB, *California Low Carbon Fuel Standard Workshop*, Presentation at Slide 23, Apr. 10, 2024, <u>https://ww2.arb.ca.gov/sites/default/files/2024-</u>

^{04/}LCFS%20April%20Workshop%20Slides.pdf. The EJAC appears to have based this on one study from Europe that uses a different model than used in the U.S. EJAC Presentation, April 10, 2024 Low Carbon Fuel Standard Public Workshop. EPA recently reviewed different models and held a workshop on assessing the greenhouse gas (GHG) emissions based on land use changes, which showed a wide range of results due largely to the significant uncertainty surrounding these analysis. Even comments that support limits on crop-based biofuels recognize that "[m]ore than 14 years of research has not led to a consensus estimate of these emissions." Comments of Union of Concerned Scientists, Aug. 27, 2024, at 2. Uncertainty, however, is not a basis to impose limitations when "[r]esearch based on misclassifications of land use and flawed assumptions and methodologies spurred skepticism about the environmental and GHG emission reduction benefits of biofuels ... has since been disproven." Todd Neeley, *Scientists: RFS Land Use Claims False*, Progressive Farmer, July 8, 2024,

https://www.dtnpf.com/agriculture/web/ag/news/business-inputs/article/2024/07/08/scientists-push-court-rejectland. CARB is to rely on the best available science.

⁸ Initial Statement of Reasons at 116-124.

⁹ See, e.g., GAP Initiative, Virginia Tech College of Agriculture and Life Sciences, *America's Disappearing Farm* and Range Land, <u>https://globalagriculturalproductivity.org/case-study-post/americas-disappearing-farm-and-range-land/</u> (last visited Oct. 16, 2024).

¹⁰ Farmland Information Center, Fact Sheet, *2022 Census of Agriculture*, at 2, Aug. 6, 2024, https://farmlandinfo.org/wp-content/uploads/sites/2/2024/02/census-of-ag-fact-sheet-2022.pdf.

¹¹ *Îd.* at 3

¹² Kate Vaiknoras, U.S. Soybean Production Expands Since 2002 as Farmers Adopt New Practices, Technologies, USDA Economic Research Service, July 26, 2023, <u>https://www.ers.usda.gov/amber-waves/2023/july/u-s-soybean-production-expands-since-2002-as-farmers-adopt-new-practices-technologies/</u>; USDA, *Climate-Smart Agriculture and Forestry*, <u>https://www.farmers.gov/conservation/climate-smart</u> (last visited October 13, 2024).

wrong policy signals, creating a disincentive to farmers to continue to innovate and further invest in sustainable practices. This appears to have been ignored by CARB.

Moreover, there is simply no reason to believe that the proposed cap would serve as a guardrail at all, even with the inexplicable addition of sunflower oil. Soybean and canola oils are major feedstocks for biodiesel production, according to data from the U.S. Energy Information Administration (EIA)¹³ and the U.S. Environmental Protection Agency (EPA).¹⁴ Yet, California's feedstock breakout does not reflect this same percentage. This shows that there are already greater incentives to use waste oils for production of biomass-based diesel under the LCFS, which CARB recognized in its April 10, 2024 Workshop (Staff Presentation at slide 53, 57-59).¹⁵ This is largely because of the lower carbon intensity scores attributed to those feedstocks. This has resulted in increased imports of waste feedstocks, which can largely be attributed to the increase in renewable diesel capacity. Renewable diesel production capacity has significantly outpaced biodiesel production capacity, which has been on the decline and "now accounts for the smallest share of U.S. biofuels capacity."¹⁶ The increased stringency in the requirements would continue to incentivize waste feedstocks over crop-based feedstocks for these new renewable diesel facilities. Limiting crop-based feedstocks would only further incentivize increased imports of feedstock, which are much more difficult to verify.

Further, it simply makes no sense that a renewable fuel, such as soybean biodiesel, with all of its environmental benefits would create "deficits" because CARB will treat it essentially as fossil based diesel. This ignores the "guardrails" already in place with respect to U.S. biodiesel production. In particular, the U.S. Renewable Fuel Standard includes protections against land conversion by requiring crop-based feedstocks to come from land that was agricultural land in December of 2007. EPA has found that total agricultural land in the United States (and Canada) has remained below that in 2007. We are concerned that the "guardrails" proposed, including land certification requirements, are inconsistent with the U.S. Renewable Fuel Standard. This could create problems in enforcement and could create an obstacle to the accomplishment and execution of the federal program by restricting feedstocks that otherwise would be eligible under the U.S. Renewable Fuel Standard and thereby impact the volume of fuels that may be available to meet the federal volume requirements. This raises potential preemption concerns.

The proposed cap on crop-based biodiesel also would not be consistent with AB32 on several grounds, including requiring consideration of other environmental impacts, seeking maximum technologically feasible and cost-effective GHG emissions reductions, and using the best available science. In establishing the LCFS, CARB recognized that it would reduce GHG emissions, but also would cut "other smog-forming and toxic air pollutants," citing to reducing petroleum dependency and achieving air quality benefits as the intent of the design of the

Low Carbon Fuel Standard Public Workshop, Staff Presentation, Slide 28, https://ww2.arb.ca.gov/sites/default/files/2024-04/LCFS%20April%20Workshop%20Slides.pdf.

¹³ EIA, *Monthly Biofuels Capacity and Feedstocks Update*, Tables 2b and 2c, <u>https://www.eia.gov/biofuels/update/</u> (with data for July 2024).

¹⁴ EPA, *RINS Generated Transactions – Feedstock Summary Report*, <u>https://www.epa.gov/fuels-registration-reporting-and-compliance-help/rins-generated-transactions</u> (data as of Sept. 10, 2024).

 ¹⁵ Available at <u>https://ww2.arb.ca.gov/sites/default/files/2024-04/LCFS%20April%20Workshop%20Slides.pdf.</u>
¹⁶ See EIA, In 2023, U.S. renewable diesel production capacity surpassed biodiesel production capacity, Today in Energy, Sept. 5, 2023, <u>https://www.eia.gov/todayinenergy/detail.php?id=60281</u>; see also CARB, April 10, 2024

286.4 program.¹⁷ While both biodiesel and renewable diesel provide tailpipe emissions reductions compared to petroleum diesel, biodiesel does have increased GHG emission reductions compared to both petroleum diesel and renewable diesel, and also provides local environmental benefits, where EPA has found environmental justice concerns with both petroleum and renewable diesel facilities.¹⁸ Biodiesel also provides more cost-effective reductions as the more efficiently produced and lower-cost fuel. Further, treating crop-based biodiesel as having the same carbon intensity as the baseline diesel fuel, rather than utilizing the carbon intensity score that was found for the specific biodiesel facility, simply has no basis in science. It further treats biodiesel inequitably, which was to be another hallmark of the LCFS.

Indeed, the proposed limitation on crop-based feedstocks would likely have a bigger impact on biodiesel facilities that are more likely to use one type of feedstock for all or the bulk of their production. Renewable diesel facilities, which are often converted from petroleum refineries, on average have a much larger production capacity than biodiesel facilities and, as newer facilities, are more likely to be designed to utilize multiple feedstocks. Different feedstocks have different levels of free fatty acids that can have an impact on the transesterification process, requiring different levels of pretreatment. Waste oils may also have additional impurities. Smaller biodiesel facilities may have been designed to utilize vegetable oils versus waste oils would effectively be excluded from the LCFS program. These facilities would not be able to compete with the larger renewable diesel facilities for these waste oils to justify adding pretreatment to their operations. Rather than protect against new land clearings, this would only limit existing plants that have long been in operation from participating in the LCFS program. While the Second 15-Day Changes would defer the 20% limitation for those that submitted a pathway certification application before the effective date of the regulation until January 1, 2028, this does not address the concerns that have been raised or the inconsistencies with the statute.

Thus, SABR Coalition believes the proposed changes would eliminate competition, exclude maximum technologically feasible and cost-effective GHG emissions reductions with respect to diesel fuels, and unfairly advantage larger, more pollutive renewable diesel and sustainable aviation fuel production facilities.¹⁹ This does not further the goals of the LCFS or follow the instructions of the California legislature. Where California has an outsized influence on the national market, as most renewable diesel produced in the U.S. is targeted for California, SABR Coalition requests that CARB be mindful of how biofuel regulatory measures taken by California, combined with federal regulatory measures, can create market distortions on the entire U.S. market. For example, sustainable aviation fuel produced from imported used cooking oil that comes online in California means that a gallon of soy biodiesel goes offline somewhere

¹⁷ CARB, *Low Carbon Fuel Standard – About*, <u>https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard/about</u> (last visited Oct. 13, 2024).

¹⁸ Renewable Fuel Standard (RFS) Program: Standards for 2023–2025 and Other Changes 87 Fed. Reg. 80,582, 80,617 (proposed Dec. 30, 2022).

¹⁹ See, e.g., Carlo Hamelinck et al., *Conversion Efficiencies of Fuel Pathways for Used Cooking Oil*, Final Report at 7 (2021), <u>https://www.studiogearup.com/wp-content/uploads/2021/03/2021_sGU_EWABA-and-MVaK_Options-for-the-deployment-of-UCO.pdf</u> (study comparing biodiesel, renewable diesel, co-processed renewable diesel, and sustainable aviation fuel found "that of all four pathways, [used cooking oil methyl ester] has the lowest production costs, the highest feedstock efficiency, the highest emission reduction performance and, consequently, the lowest carbon abatement costs").

286.4 else in the country. This effectively results in an increase in GHG emissions since biodiesel is the lowest cost, lowest carbon biomass-based diesel.

286.5 II. CARB Should Conduct More Analysis Before Imposing Arbitrary Limits on Biodiesel Feedstocks, Including Reconsidering its ILUC Modeling and Determinations Based on Disputed ILUC Assumptions and Recognizing the Sustainable Agricultural Practices of US Farmers.

At a minimum, based on the limited information provided to support the proposed limitation, it is clear that more analysis is required to be conducted by CARB and presented to the public for comment before a proposal limiting biodiesel feedstocks can be finalized. We found no analysis of the impacts of the proposed cap or the expansion to include sunflower oil, which has different market considerations than soybean oil and canola oil. As noted above, we believe the proposed cap would impact biodiesel producers more than renewable diesel producers, yet CARB conducted no environmental review of these potential implications.²⁰

Instead, CARB appears to be relying on unsupported or highly disputed claims of land use changes as a result of increased crop-based biomass-based diesel under the LCFS. As SABR Coalition explained in its comments on the First 15-Day Changes, modeled forecasts of emissions attributed to claimed indirect land use change (ILUC) have not been found to be accurate. "[A]nalyses based on more complete, updated data, found that the average carbon intensity of biofuels is significantly less than conventional gasoline," with this benefit "growing at an accelerated pace" as technologies and practices evolve.²¹ As the data and science has improved, CARB must continue to update its modeling, including adopting the most current version of the GTAP model, which shows significant decreases in emissions associated with land use impacts for soybeans.²²

In addition, the U.S. Department of Agriculture (USDA) has recognized numerous climate-smart agriculture and forestry mitigation activities that can help reduce GHG emissions from the agricultural sector.²³ This includes land management and restoration of disturbed lands. A scenario reviewed by CARB recognized the potential for including these practices as part of the credit generation process, but CARB did not include it in its analysis, stating there is not yet a mechanism for quantifying or verifying these practices.²⁴ Some practices, however, are already being considered as part of the Inflation Reduction Act tax credits that look at carbon intensity of fuels, such as sustainable aviation fuel. CARB should incorporate these before imposing additional (and unsupported) ILUC penalties on crop-based feedstocks for biodiesel. SABR

²⁰ In addition to providing greater GHG emissions reductions than renewable diesel, biodiesel production also uses less water and has less waste than renewable diesel production. Renewable diesel production facilities also have a larger footprint.

²¹ Todd Neeley, *Scientists: RFS Land Use Claims False*, Progressive Farmer, July 8, 2024, <u>https://www.dtnpf.com/agriculture/web/ag/news/business-inputs/article/2024/07/08/scientists-push-court-reject-land.</u>

²² See Comments of American Soybean Association, Aug. 26, 2024, at 6; Comments of SABR Coalition, Aug. 27, 2024, at 5.

²³ See, e.g., USDA Natural Resources Conservation Service, *Climate-Smart Agriculture and Forestry (CSAF) Mitigation Activities List for FY2025* (2023), <u>https://www.nrcs.usda.gov/sites/default/files/2023-10/NRCS-CSAF-</u> <u>Mitigation-Activities-List.pdf</u>.

²⁴ Initial Statement of Reasons at 125.

286.5 Coalition also urges CARB to work with USDA on those efforts and incorporate them in updated modeling.

Finally, as also explained in SABR Coalition's prior comments, "there has been more emphasis on sustainability and indirect effects of bioenergy than on baseline (often fossil fuel) scenarios. ... There needs to be equitable treatment of direct and indirect effects for any energy options being analyzed including baseline fuel(s) that would be replaced by proposed bioenergy sources."²⁵ Land use change impacts of conventional and unconventional oil production continues to be largely ignored, despite the increase in sourcing oil from unconventional sources and new wells being needed when old wells become depleted. This is compared to agricultural land in the United States continuing to trend downward with increased yields attributed to land intensification and improved agricultural practices versus clearing new lands. Unlike the lack of evidence of land use changes that can be attributed to biofuel production, there is real world and visual evidence of impacts of oil production on habitats, including sensitive ecosystems.

286.6

III. Double Counting of Indirect Emissions at the Federal and State Levels Already Restricts use of Crop-Based Feedstocks in California.

As noted above, the incentives in California already lean toward waste feedstocks for biomassbased diesel fuels, not crop-based fuels. SABR Coalition's prior comments explained the double penalties that are imposed on crop-based feedstocks, particularly soybean oil. We restate those comments here with a revision to correct a typographical error.

The re-evaluation of indirect emissions modeling for crop-based biofuels becomes especially important when the Clean Transportation Production Credit (Section 45z) goes into effect in 2025. To the extent Section 45z embraces a California-style carbon intensity scoring system in its incentive structure, it will likely apply ILUC penalties to crop-based fuels. Currently approximately half of the nation's biodiesel and renewable diesel fuels (and nearly all the nation's sustainable aviation fuel) are sold in California or one of the other states that have embraced a California-style LCFS state program.

Under the current expected approach, a gallon of biodiesel from soybean oil will have an ILUC penalty of 10 g/MJ of CO₂ for assumed land conversion (for which there is no conclusive scientific evidence) assigned at the federal level. If that same gallon is consumed in California, the same 10 g/MJ ILUC penalty is applied again to the same gallon under the LCFS, as if the gallon was burned twice and the same land was converted twice. The combination of the federal 45z and California LCFS will have assigned 20 g/MJ of CO2.²⁶ And this is the best-case scenario assuming that CARB updates its version of the GTAP-BIO model, which it has not indicated a willingness to do. If it does not, CARB will assign an ILUC penalty of 29.1 g/MJ of CO2, making a total combined ILUC penalty of 39.1 g/MJ on the gallon of soy biodiesel that is applied against the combined value stack of credits. This is nearly four times the amount of ILUC penalty that the GREET model has forecasted that a gallon of soy biodiesel should be assigned.

²⁵ ISO PC 248 Working Group 4 Report on Indirect Effects at 2 (2012).

²⁶ A gallon of biodiesel contains approximately 125 MJ of energy.

https://indico.ictp.it/event/8008/session/3/contribution/23/material/slides/2.pdf.

286.6 When in reality there is no solidly consistent scientific evidence that the gallon of soy biodiesel cont. will ever cause any land conversion.

This double (or rather, quadruple) counting is already happening today with SAF under the federal SAF credit (40B) combined with the California LCFS. Such a flawed policy is already leading to an alarming spike in questionable used cooking oil imports from China into California. These imports are displacing soybean oil, our nation's most abundant and sustainable agricultural feedstock. This outcome results in bad carbon policy, as well as bad agricultural, energy, trade, and economic policy. All of these factors make it critical that flawed indirect emissions modeling be re-evaluated using current science and actual scientific evidence. This reconsideration should rely on the hindsight of 20 years of data-gathering and actual science rather than relying on future forecasts, failed theories, flawed assumptions, and outdated data. There has been twenty years to prove the theory that land use change would be caused by US crop-based fuels, but there is more evidence to the contrary.

CONCLUSION

286.7 SABR Coalition again expresses its opposition to CARB's proposal to cap crop-based feedstocks for biodiesel production in the LCFS program. Any claimed risk of increased use of crop-based feedstocks for biodiesel has not been established for soybean or canola oils, much less to expand it to sunflower oil (or any additional feedstocks). Indeed, real world data and *science* indicates that claimed risk of deforestation and adverse land use change cannot be attributed to biodiesel production as a result of the LCFS. In fact, there is reason to believe such a limitation would increase GHG emissions and other environmental harms as a result of lost biodiesel volumes.

While we believe the carbon intensity scores already address potential land use changes, we continue to believe, even there, they are significantly overstated. Thus, SABR Coalition again urges CARB to reconsider its approach to ILUC modeling methods. At a minimum, CARB must use the most recent version of GTAP-BIO it uses to measure indirect emissions of crop-based biofuels. It should use the most current data available before it attempts to impose restrictions on biodiesel that can be used to meet the LCFS targets. Biodiesel is a cost-effective, low-carbon fuel that can be used today to reduce GHG emissions.

As noted above, SABR Coalition supports the comments of the American Soybean Association, particularly with respect to the sustainability and certification requirements in the proposal.

We appreciate the opportunity to comment on these important policy matters. We thank you for your work and look forward to working with you going forward to help the LCFS realize its important carbon reduction goals. Please contact me if you have any questions.

Sincerely, Josph John

Joe Jobe, CEO Sustainable Advanced Biofuel Refiners Coalition joe@rockhouse.us 573.680.1948

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16 October, 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 Proposed Amendments to the Low Carbon Fuel Standard

Dear LCFS Team:

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 (ITS-Davis) has been engaged in research, policy analysis, and technical assistance relating to the LCFS since it was first developed, over 15 years ago. Since then, the LCFS 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 is intended 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

The 2nd 15-day comment package ("2nd 15 day package") released on October 1st almost certainly represents the conclusion of an extensive process of policy development and stakeholder engagement that began almost two years ago. 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. This process has sought to address persistently low credit prices that present a significant obstacle to California's efforts to achieve carbon neutrality by 2045. On the whole, the package of amendments that will be presented to the Board in November is likely to provide some support towards this end, and provide a transient period of market balance, however the fundamental challenges facing the market will remain and additional reforms will be necessary to secure the LCFS for long-term stability.

These comments are presented in the spirit of ITS- Davis's mission to bring science into the policy process. Neither UC Davis nor ITS-Davis seek a specific policy outcome; these comments are offered to help California meet its climate, environmental, and equity goals.

¹ SB 32 (Pavley, Chapter 249, Statutes of 2016), AB 1279 (Muratsuchi, Chapter 337, Statutes of 2022)

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287.2 Impact of 2nd 15 day Package on Credit/Deficit Balance and LCFS Credit Price

The changes proposed in the 2nd 15 day package are, for the most part, unlikely to have significant impacts on LCFS credit supply and demand as compared to changes proposed earlier. The relaxation of the 20% per-company cap on crop-based feedstock would be expected to slightly reduce credit generation by allowing greater fractions of crop-based (and therefore, higher-CI fuels) to be credited under the LCFS, while changes to HRI provisions may result in slightly more credits being generated from these pathways.

We note that the total effect of all proposed amendments, including the original proposal and both 15 day packages is unlikely to address the large oversupply of LCFS credits relative to deficits, and therefore are unlikely to result in significant increases in LCFS credit prices. We have submitted modeling results with previous comments, as well as a report detailing the methodology of the Fuel Portfolio Scenario Model (FPSM) used to conduct this analysis.² As a result, if the amendments proposed to date are adopted without any further change, and absent significant upheaval in U.S. biofuel markets, we would expect the LCFS credit price trends observed over the last two years to persist indefinitely. The credit prices these imply, predominantly in the \$50-75 range, have been identified by a wide range of stakeholders as inadequate to support the investments required for California to meet its long-term GHG reduction goals in the transportation sector.

287.3 Changes to Auto-Acceleration Mechanism Triggering Criteria

Proposed changes shift the timing of the determination of whether the proposed auto-acceleration mechanism (AAM) is triggered and when such a decision would be announced. Previously, this determination would occur only once each calendar year in May, the 2nd 15 day package proposes shifting this to a quarterly determination, with announcements in February, May, August, and November. CARB Staff have indicated that the purpose of this change is to allow greater advance notice of an AAM triggering event. Given the potential for the AAM to impose significant benchmark increases, providing advance notice could limit the risk of market volatility, or obligated parties finding themselves short of compliance credit.

We note that in discussions with LCFS stakeholders, researchers and analysts, there is substantial uncertainty regarding the function and limits of this provision. Several parties read the proposed language in such a way that would allow the AAM to be triggered more frequently, or more than twice before 2030. We reached out to Staff by email for clarification and were informed that CARB's interpretation of this section is that it does not allow the AAM to be

² See: <u>Updated Fuel Portfolio Scenario Modeling to Inform 2024 Low Carbon Fuel Standard Rulemaking</u>, <u>UCD Feb 20 2024 LCFS Comment</u>, <u>UCD Comments on April 10 LCFS workshop</u>, and <u>UCD August 27</u> <u>2024 Comment on 15 day amendment package</u>

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287.3 cont. triggered more frequently, and particularly not three times prior to 2030. We appreciate Staff's quick response and willingness to provide clarification on this matter.

While Staff were quite clear that the intent of this provision is to offer additional advance notice prior to AAM triggering events, the language in the 2nd 15 day package does not effectively convey this intent, in two key ways. First: there may be circumstances where quarterly determination of AAM triggering could actually reduce advance notice of target increases. For example, if the Executive Officer determines at the February and May determination dates that the conditions have not been met to trigger the AAM, but subsequent data change this determination such that an AAM triggering event is announced at the November determination date, the proposed amendments suggest that the target would increase the following January, which means obligated parties would be subject to the higher target with only 6 weeks of advance notice. While this sequence of events would require a specific, and unusual combination of market factors, it is not implausible that these factors could occur.

287.4 Second, the language in the 2nd 15 day package can be reasonably read in such a way as to allow a third triggering event prior to 2030, if the following sequence of events were to occur.

May, 2027 - The Executive Officer determines and announces that the AAM has been triggered, based on data from 2026.

January, 2028 - The 2029 target is adopted, one year ahead of schedule, because the AAM has been triggered once..

August 2028 - The Executive officer announces a second AAM triggering event, based on data from 2027 and 2028.

January, 2029 - The 2031 target is adopted, two years ahead of schedule, because the AAM has been triggered twice.

November, 2029 - The Executive Officer announces a third AAM triggering event, based on data from 2028 and 2029

January, 2030 - The 2033 target is adopted, three years ahead of schedule because the AAM has been triggered three times.

In this scenario, which aligns with a reasonable reading of the language in the 2nd 15 day package (an interpretation many LCFS stakeholders arrived at independently), the AAM could be triggered three times in the 2020's, leading to a 43.5% CI reduction target in 2030. The last of these three triggering events would have been announced only 6 weeks before the target was officially implemented in January. In addition to not aligning with Staff's expressed intent, this outcome would create the risk of credit shortfall and significant gas price impacts to consumers. In our presentation at the May 23, 2023 LCFS workshop on auto-acceleration mechanisms, we discussed the possibility of

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287.4 cont. overcorrection by AAM triggering events.³ This risk is especially present in the early 2030's when the CI target increases by 4.5% per year, but light-duty EV sales shares may still be significantly below 100%.

The proposed language from the 2nd 15 day package may need to be clarified to better reflect the intent of the proposal. Specifying that the target cannot be accelerated two calendar years in a row could accomplish this, as would a requirement that target increases would not take effect until an adequate amount of time had passed (such as two or three quarters) to allow obligated parties the opportunity to update their compliance plans to reflect the higher target.

Limits on Crop-Based Feedstock Content

287.5 The 2nd 15 day package proposes adding sunflower oil to the list of crop-based oils subject to the company-level 20% cap on the use of such oils as biomass-based diesel feedstock, and makes changes to the criteria used to determine whether a company is eligible for an exemption from this provision until 2028.

The addition of sunflower oil aligns with the primary intent of this provision, which is to clearly signal the intent to limit the amount of crop-based feedstock that can be credited under California's LCFS. While sunflower oil is not a major source of biomass-based diesel feedstock at this time, it is a significant contributor to global vegetable oil supplies and there are no known technical reasons why it could not expand its footprint in the biofuel space, in which case the use of sunflower oil could have offered a loophole around the intent of this provision. Adding sunflower to the list of crop-based fuels would therefore close this potential loophole.

The change in exemption criteria would be expected to significantly expand the number of companies eligible to exceed the 20% cap through 2028. There is no clear indication, in published research or recent market data, as to why such an expansion would be required at this time. As we discussed in our August 27th comment letter, this company-level cap on crop-based feedstock is unlikely to present a significant obstacle to the continued growth of biomass-based diesel (BBD) in California, because there are ample sources of waste and residue feedstock available to U.S. BBD producers to allow continued BBD consumption growth in California while shuffling crop-based feedstocks to other jurisdictions.⁴ As we observed in our previous comment, the proposed 20% limit is likely to function primarily as a signal of California's intent to de-emphasize the role of crop-based biofuel feedstocks over time, but because feedstock shuffling offers a low-cost route to compliance, this would provide minimal

³ https://ww2.arb.ca.gov/sites/default/files/2023-05/UCDavis_052323.pdf

⁴ UCD August 27 2024 Comment on 15 day amendment package

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- ^{287.5 cont.} protection against ILUC or other sustainability risk. Extending additional exemptions from the 20% cap, as the proposed changes in the 2nd 15 day package would do, further limits the potential benefits from this provision, without providing a strong rationale for doing so.
- Additionally, the provisions regarding the 20% cap on crop-based feedstocks specifies that volumes of fuel in excess of the cap be assigned a CI score equal to the relevant LCFS benchmark for the most comparable fossil fuel in that year. While this will not allow such fuels to generate credits, they would still have a significant cost advantage over fossil fuels that would generate LCFS deficits. In years where the LCFS target is significantly lower than the baseline fossil fuel carbon intensity, this can imply a quite significant per-gallon cost advantage for these fuels, even without generating credits. If the benchmark is lower than the pathway CI score for the fuels in question, this could even lead to crop-based fuels in excess of the 20% per-company cap being assessed at a lower CI score (meaning more credits per gallon) than the fuels that do not exceed the cap. This creates a perverse incentive for companies to emphasize crop-based fuels in their offerings to California, and undermines the intent of the 20% per-company cap. Assigning fuels in excess of the cap the CI score of the most comparable fossil fuel would eliminate this perverse incentive and better reflect the intent of the LCFS as well as this specific provision.

Classification of Corn Stover as a Specified-Source Feedstock

^{287.7} The 2nd 15 day package proposes adding corn stover to the list of specified source feedstocks that must supply chain of custody documentation, but are not required to complete a feedstock sustainability certification. Specified source feedstocks are generally those based on wastes and residues, for which there is limited alternative use and are not thought to entail a significant upstream source of GHG emissions. Corn stover, however, has some non-fuel uses and removing stover from fields to use it as a feedstock can have significant GHG impacts. As such, corn stover does not share enough characteristics with actual waste and residue feedstocks to justify inclusion on this specified-source feedstock list.

Corn stover is generally classified as an agricultural residue under most applicable classification systems, however this does not necessarily mean it is free from emissions impacts that should be considered under the LCFS. Corn stover may be used as an animal feed or bedding material, in which case shifting to become biofuel feedstock would cause additional feed or bedding material to be procured to back-fill what is lost. More importantly, however, corn stover is customarily left on most corn fields after the grain is harvested, where it is subsequently re-incorporated into the soil, either via tillage, or in the case of no-till fields, by compaction and other natural processes. The solid carbon embodied in corn stover helps maintain soil organic carbon (SOC) stocks, which would otherwise decline over time as SOC is decomposed by soil microbes. Removing stover to use for biofuel feedstock reduces the rate of SOC accumulation, and can result in long-term reductions in total SOC levels in corn fields. While studies have

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287.7 cont. demonstrated that small amounts of stover can be removed without significantly impacting SOC levels, the amount of stover that can be removed varies widely from field to field due to soil, climate, agronomic, and other factors. A meta-analysis of U.S. field trials in which varying amounts of stover were removed showed this variability, and also found that even relatively low rates of stover removal, <25% of total stover mass, can lead to significant declines in SOC in some fields.⁵

Given that the LCFS is intended to reduce GHG emissions over the full life cycle of a fuel, this loss needs to be carefully considered during the pathway certification process, higher rates of SOC loss due to stover removal can significantly increase carbon intensity of cellulosic biofuels, or even render the resulting fuel more carbon intensive than the petroleum it displaces.⁶ SOC impacts of stover removal must be evaluated on a case-by-case basis, accounting for local conditions. Effective sustainability certification, especially when backed by soil carbon measurements, could mitigate this risk. The categorical exemption of corn stover from the proposed certification requirements means that CI certification of stover-based pathways may lack the necessary evidence to effectively evaluate GHG impacts from its use, thereby undermining the LCFS' ability to achieve long-term life cycle GHG reduction.

Biomethane Pathway Recertification

The 2nd 15 day package proposed changes to § 95488.9 (f) (3) that would limit the number of recertifications specified RNG projects that use dairy or swine manure as feedstock can be credited for, and also that project that break ground in 2030 or later shall only receive avoided methane credits for the duration of their current pathway certification at the time. We note that the language in § 95488.9 (f) (3) (A) is articulated as a maximum limit on the number of recertifications, not a requirement that each pathway be offered recertifications up to that limit.

The life cycle analysis underpinning LCFS credit quantification requires certain analytical assumptions or parameter determinations to be made, either explicitly or implicitly. Additionality is one of the most important and complex of these. Best practices throughout scientific literature on LCA, especially when it is utilized as part of regulatory or incentive programs such as the LCFS, emphasize the need to ensure that actions or production being credited are additional to what otherwise would have happened in the absence of the regulatory or incentive. In the LCFS context, this means that only actions that would not otherwise have occurred without the LCFS

⁵ C. W. Murphy, "Modeling the Environmental Impacts of Cellulosic Biofuel Production in Life Cycle and Spatial Frameworks by," Ph.D. Dissertation, University of California, Davis (2013). Chapter 4 https://www.proquest.com/dissertations-theses/modeling-environmental-impacts-cellulosic-biofuel/docvie w/1525046145/se-2?accountid=14505

⁶ C. W. Murphy, A. Kendall, Life cycle analysis of biochemical cellulosic ethanol under multiple scenarios. *GCB Bioenergy* **7**, 1019–1033 (2015). http://doi.wiley.com/10.1111/gcbb.12204

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287.8 cont. should be considered for CI determination and subsequent crediting. The LCFS has established a clear and transparent standard that actions required by law or regulation should not be credited or used to reduce the CI of certified fuel pathways because they are non-additional. This is to say, one cannot receive LCFS credit for actions taken to comply with applicable laws. Allowing previously certified pathways to remain valid through their expiration, even if they include credits or consideration of actions rendered non-additional by new law or code adopted after their certification deviates from both sound science and precedents repeatedly established under the LCFS. In some cases, this deviation is justified if necessary to maintain market confidence in the validity of LCFS incentives as a guide for investment.

The proposed changes to § 95488.9 (f) (3) (B) however, create a categorical exemption for projects that break ground in 2029 or before, allowing them to be recertified with avoided methane credits, even if such credits would be clearly non-additional at the time of recertification. This exemption breaks with well-accepted principles of life cycle analysis as well as past precedent under the LCFS. There can be a valid rationale to extend avoided methane crediting beyond what a typical interpretation of additionality would suggest, e.g. if the capital cost of a digester has not been fully repaid by the end of a crediting period. This exemption may be more common in early digester projects - which may be more expensive than later ones due to their reliance on less mature technology and supply chains. The proposed provision, however, essentially assumes that this is the case without requiring project operators to provide evidence. The proposed language in the 2nd 15 day period does not attempt to ascertain whether such exemptions are necessary, cost-effective, nor how long the crediting of non-additional emissions benefits must continue to repay the project's capital, and instead allows recertification of additional 10-year crediting periods for all pre-2030 digester projects.

Accurate assessment of GHG impacts, underpinned by a clear and accurate assessment of additionality is essential for the success of the LCFS. Crediting non-additional emissions benefits increases costs borne by gasoline and diesel consumers without providing commensurate emissions benefits. If and when the LCFS breaks from common and well-supported practices around additionality assessment, these exceptions should be as narrow as possible, to preserve the LCFS' basis in sound science. Limiting the duration of recertification with avoided methane credits to better match the actual needs of specified projects would better align the LCFS with the consensus in the life cycle assessment literature.

Sustainability Certification

We note several changes to the proposals around feedstock sustainability certification in § 95488.9 (g), and observe that while these changes generally improve the core functionality of the proposed certification requirements, none address the core issues of sustainability and ILUC

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287.9 risk that we have raised in multiple previous comment letters.⁷ Taking into consideration all proposed changes across both the original draft text and both 15 day packages, the LCFS is still inadequately mitigating the significant ILUC risks entailed by the use of biofuels at large volumes. This means that GHG benefits from these fuels as estimated using their pathway certified CI scores likely overestimate actual emissions impacts, and significant sustainability risks remain unaddressed by this rulemaking.

Clarification of Definitions and Intent

This section presents comparatively smaller issues with definitions and other proposed changes from the 15 day package.

Definitions

Recovered Organics - The 2nd 15 day package proposes adding language to the definition of 287.10 "Recovered Organics" to specify that these can come from anaerobic digestion or compost facilities. There are certainly opportunities to recover organic materials for beneficial utilization from streams that enter, leave, or circulate within anaerobic digestion facilities or compost facilities, however we note that the term "recovered organics" is typically used in ways that align with the original definition: where organic material is recovered from a mixed waste stream, in which some fractions are inorganic or otherwise unusable. Given that anaerobic digestion and compost facilities would, in most operational examples, be dealing with streams made up solely of organic material, this new definition may expand the concept of "recovered organics" outside of its customary use, which could lead to unexpected and/or unwanted interactions with other organic waste policies. We were unable to find instances of the term "recovered organics" being used elsewhere in the 2nd 15 day package, though our search did not exhaustively cover all of the supporting documents. Given that the term "recovered organics" seems to be sparingly used, if at all, it is difficult to ascertain the rationale behind this change or the impacts it might have, and we suggest CARB Staff provide additional clarification prior to adopting this change.

Clarifications of Intent

287.11 § 95488 (i)(2) - This proposed change modifies language about the use of book-and-claim accounting to track RNG used as a transportation fuel, an input to the production of specified fuels, or to produce electricity for EV charging. The change to § 95488 (i)(2) states

⁷ Notably: <u>UCD Feb 20 2024 LCFS Comment</u> and <u>UCD August 27 2024 Comment on 15 day amendment</u> package

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287.11 cont.

"Indirect accounting may be used for RNG used as a transportation fuel, <u>to produce</u> <u>electricity using a fuel cell for EV charging</u>, or to produce hydrogen for transportation purposes" (underlined text indicates the additions in the 2nd 15 day package).

The word choice in this clause is unclear, one reading of it would imply that book-and-claim accounting can only be used when RNG is being used to generate electricity using a fuel cell for EV charging or to produce hydrogen, i.e. excluding its use in CNG or LNG fueled vehicles. A following sub-part, § 95488 (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, <u>or to produce electricity using a fuel cell for EV charging</u>, or as an input to hydrogen production, without regards to physical traceability. " (underlined text indicates the additions in the 2nd 15 day package).

This section (as well as § 95488 (i)(2)(B), which has language similar to § 95488 (i)(2)(A) makes it clear that use of RNG in CNG or LNG fueled vehicles would also allow for book-and-claim accounting. Based on prior statements by CARB staff, this reading appears to match the intent of these provisions. Simply adding the word "or" immediately before "to produce hydrogen" in § 95488 (i)(2) would match the wording in § 95488 (i)(2)(A) and remove any ambiguity from this section.

Unresolved Issues Point to Need for Additional Rulemaking in the Near Term

^{287.12} From the start of this rulemaking process, 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, and the challenges this presents to California's long-term climate goals, this focus on corrective measures is understandable.

The limited scope, however, meant ignoring many critical and complex structural topics that, when fully explored, might offer avenues to improve the efficiency, resilience, and effectiveness of the LCFS. 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 fossil fuels rapidly exit California's fuel supply, expanding the LCFS to cover air, water, and rail fuels, integrating vehicle or transportation-system effects into fuel CI assessment, differentiation between so-called "bridge" fuels and those with the capacity to achieve carbon

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287.12 neutrality, etc. As discussed in our many comments on this rulemaking, 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.

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 California's climate policy portfolio. 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. 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. Co-Director, Low Carbon Fuel Policy Research Initiative Associate Director, Energy Futures Program Institute of Transportation Studies University of California, Davis, California, USA



October 16, 2024

Steven Cliff, Executive Director California Air Resources Board 1001 I St. Sacramento, CA 95814

RE: SRECTrade Comments on Proposed Low Carbon Fuel Standard (LCFS) Amendments, version October 1, 2024

Dear Mr. Cliff:

SRECTrade appreciates the work by CARB to engage stakeholders and integrate comments into the proposed amendments.

We appreciate your consideration of our comments and requests for clarification:

1. Support updates to the Carbon Intensity Standard and Auto Adjustment Mechanism. SRECTrade applauds CARBs amendments to tighten carbon standards and provide increased stability to the LCFS program. Additionally, we support the proposal to move the auto adjustment mechanism to a rolling four quarter trigger which will bring greater market certainty and improve responsiveness of the regulation to market supplies and demands.

2. <u>Changes to forklifts under the regulation</u>

- 288.2
- a. <u>Support the phase-in the implementation of forklift metering requirements.</u> SRECTrade supports the phased in approach to forklift metering as an appropriate reflection of the complexities for forklift owners to implement the updates. We appreciate CARB's consideration of the business impacts and allowing for more time to meet these requirements.
- b. Suggest phase in of changes to credit generator. The proposed updates to Section 95483(c)(4)(A) will result in changes to registrations and cause disturbance to the forklift market at the same time the industry is managing changes associated with the Zero Emission Forklift Rule. We suggest phasing in the proposed change to making the owner of the FSE the credit generator at the same time meter requirements are implemented so that re-registrations and changes to reporting can be handled at one time. This will also enable fleet owners and operators to address program changes and registration requirements at one time, rather than multiple changes and re-registrations to address the change in credit generator and change in metering registration separately.
- 288.4 c. <u>Clarity on implementing EER updates.</u> SRECTrade requests that CARB clarify when the changes to the forklift EER will go into effect as well as the associated changes to application type reporting based on forklift capacity rather than model year. This clarification will give all parties time to update their reporting systems and support a smooth transition.
- 288.5 3. Clarification on changes to treatment of eTRUs. We request CARB to provide further clarification on the proposed changes to eTRUs, including:
 - a. In Section 95483.2(b)(8)(B)(6), further define the owner of the fuel dispensing equipment (i.e. charger) as the credit generator, particularly in circumstances where the larger facility may be owned or operated by a different entity.
 - b. In the same section, please clarify if the 'equipment' referred to in the following clause is a reference to the eTRU itself, or the charger: "then it is optional to provide serial number assigned to each equipment by the OEM and the name of the OEM".
 - c. Please address the timeline for implementing these changes and intentions on transferring existing register eTRUs to the newly adopted registration guidelines.

- 288.6 4. Update verification requirements for site visits to align with EV Charging. EV Charging transactions are largely driven by data collection and management systems; these operations are meaningfully different from fuel generation facilities and should be treated at the verifiers discretion. Specifically, in cases where a central records location does not exist, SRECTrade recommends that the verifier may use their professional judgement to determine how best to evaluate key personal and data management systems virtually.
- 5. Implementation of designations for existing FCI pathways. The proposed amendment to Section 95486.2(b)(1) allows for a designee to report for FCI pathways. SRECTrade requests clarification on Implementing this update, for example can existing FCI pathways and registrations be moved to a single consolidated account managed by the designee?

Sincerely,

Becca Teigen Director, Clean Transportation SRECTrade, Inc. (415) 915-9053 Becca.teigen@srectrade.com

About SRECTrade

SRECTrade provides management and transaction solutions for renewable energy and clean fuel programs across North America. SRECTrade's parent company, Xpansiv, provides market infrastructure to rapidly scale the world's energy transition. Xpansiv operates CBL, the largest spot exchange for environmental commodities, including carbon credits and renewable energy certificates.



October 16, 2024

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

Submitted Electronically

Re: Comments regarding the second 15-day public notice for the proposed amendments to California's Low Carbon Fuel Standard

Dear Chair Randolph,

Thank you for the opportunity to provide comments on the second 15-day public notice for the proposed amendments to California's Low Carbon Fuel Standard (LCFS). Environmental Defense Fund (EDF) appreciates the work CARB staff has dedicated to amending the Low Carbon Fuel Standard. EDF looks 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.

EDF hopes to see amendments that sustain the LCFS's role in promoting the use of lower carbon alternatives to petroleum fuels, thus bringing substantial health, economic, and environmental benefits. To that end, we offer the following comments on the proposed LCFS amendments concerning hydrogen, feedstock sustainability, and sustainable aviation fuel (SAF).

<u>Hydrogen</u>

EDF's hydrogen team consists of experts across many geographies working together to ensure that zero- and low-carbon H₂ deployment delivers on its promise to generate maximum climate benefits while protecting public health, environmental integrity, and community well-being — locally and globally. EDF has been a longstanding advocate within the U.S. hydrogen sector, actively participating at both state and federal levels to push for strong hydrogen outcomes, most recently around the 45V Hydrogen Production Tax Credit and DOE's Hydrogen Hubs program. Our in-house science team has

also spearheaded cutting-edge research initiatives dedicated to advancing hydrogen and methane leakage detection and mitigation.

EDF appreciates CARB's thoughtful approach to leveraging LCFS to effectively scale up hydrogen production and advance California's decarbonization efforts. We offer the following recommendations to ensure implementation includes proper protections and maximizes climate benefits.

289.1 **CARB should tighten the carbon emissions threshold for "low-carbon hydrogen" to ensure more** rigorous standards

The current carbon emissions threshold for 'low-carbon hydrogen' should be lowered. The proposed removal of the electrolytic requirement makes it more likely that high-emissions hydrogen is produced and sold into the system. The proposed energy density threshold for what is defined as 'low-carbon hydrogen' (i.e., less than or equal to 55g/MJ for gaseous hydrogen and 95 g/MJ for liquid hydrogen) equates to 6.6 kgC02e/kgH2 for gaseous and 11.4 kgC02e/kgH2 for liquid hydrogen respectively. Despite including end use in the system boundary, these thresholds need to be more rigorous to ensure that LCFS credits do not support the production of pollutive hydrogen.¹ For example, the EU well-to-wheel threshold number is significantly lower at 3.38kg C02e/kgH2 as part of the Renewable Energy Directive (RED III).²

289.2 If the electrolytic requirement for hydrogen is removed, other climate protections need to be put in place

Removing the electrolytic requirement and allowing hydrogen produced via fossil fuel pathways to be eligible does stand to significantly increase the GHG emissions associated with hydrogen production. For example, a recent analysis conducted by EDF found that for every fossil hydrogen facility built instead of a renewable hydrogen one, GHG emissions would be expected to increase at least 7-fold – equaling the long-term climate impact of 2-3 natural gas-fired power plants each year.³

CARB proposed extending the credit eligibility of hydrogen produced from fossil fuel pathways until 2035 – adding five years to the original phaseout date of 2030. Hydrogen produced via fossil fuel pathways must include important provisions to address the full climate impact of hydrogen, as outlined below.

1. Upstream methane emissions accounting must be accurate within LCFS: Upstream methane emissions accounting must be accurate within LCFS to capture the full impact of fossil-based hydrogen. Methane is the main component of natural gas and is vented and leaked into the atmosphere throughout the natural gas supply chain. Upstream methane emissions can greatly reduce the climate benefits of fossil-based hydrogen. For example, when combined with the warming impact of hydrogen emissions (from leaking, venting, and

² https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/747085/EPRS_BRI(2023)747085_EN.pdf

¹ <u>https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard; Calculations assume a 120 MJ/kg energy density for hydrogen.</u>

³ <u>a6nmb6p6646ftfboj4l7oa1y0j662jfc.pdf (edf.org)</u>

289.2 cont. purging), high rates of methane leakage (i.e., 2.1%) can make some forms of blue hydrogen worse for the climate in the near term than the fossil fuel alternatives it is replacing.⁴

In the same way that emissions from electricity generation vary by grid region, methane emissions from oil and gas production vary substantially by basin. For example, recent measurement data from EDF's MethaneAIR program has found that methane leak rates from individual oil and gas basins can vary widely, ranging from 1% of gross gas production to nearly 8%.⁵ Any estimates around upstream methane emissions should be basin-specific and not reliant on a single nationwide default methane leak rate as it obscures these large differences between basins and prevents full and accurate accounting of greenhouse gas emissions.

Some hydrogen producers have proposed the ability to enter user-specific methane rates as part of emissions assessments. However, this data is not yet verifiable, and peer-reviewed studies using direct methane measurements continue to demonstrate that actual emissions are significantly higher than self-reported estimates contained in official inventories.⁶ Natural gas certification schemes vary widely in coverage, participation, integrity, and verification and monitoring requirements, and currently, none of the existing certification regimes are sufficiently robust to be included in a regulatory framework.⁷

As more robust verification systems become developed,⁸ it will be important that this process includes regularly updating the residual national average that others claim and/or otherwise avoiding the risk that producers would cherry-pick the lowest number (i.e., their user-specific rate or the national average, whichever was lowest). Overall, until user-specific values can be reliably verified, CARB should require basin-specific methane rates to be utilized.

Include actual carbon capture rates: CARB must require actual, verified carbon capture rates. "Nameplate" capacities can be erroneous as CCS technology often captures carbon dioxide at lower rates, facilities may not run CCS continuously or fully control their emissions from all processes, and infrastructure for carbon transport and storage can have unplanned outages. Producers must also verify claims by demonstrating permanent sequestration, detailing each ton of carbon stored while following best practices. This data also must be reported, verified, and publicly available.

289.4

3. **Low-carbon RNG should not be allowed to offset the hydrogen carbon intensity score**: While EDF supports the use of low-carbon RNG in book-and-claim accounting to offset fossil

⁴ https://pubs.acs.org/doi/10.1021/acs.est.3c09030

⁵ <u>https://www.edf.org/media/new-data-show-us-oil-gas-methane-emissions-over-four-times-higher-epa-estimates-eight-times</u>

⁶ https://www.nature.com/articles/s41467-021-25017-4

⁷ Efforts are ongoing to update methane emissions reporting under subpart W of EPA's Greenhouse Gas Reporting Program (GHGRP), but existing reporting requirements have been shown to significantly underestimate actual emissions. The GHGRP is also limited in coverage, applying only to larger facilities, and lacks monitoring and verification requirements. It would therefore be inappropriate at this point to allow the use of bespoke inputs based on emissions reported to subpart W.

⁸ https://www.catf.us/2024/07/joint-catf-edf-principles-methane-reporting-45v/

- 289.4 cont. natural gas transportation fuel, extending this accounting method to hydrogen's carbon intensity value within the LCFS would be problematic. Allowing low-CI RNG scores to affect hydrogen's CI eligibility would further undermine the hydrogen's climate benefit by effectively offsetting a different, cleaner production method of hydrogen. If this offset were allowed, unabated dirty hydrogen production could be eligible for the LCFS by claiming a very small portion of RNG inputs.
- 4. Consider the warming impact of hydrogen emissions: Hydrogen itself is an indirect 289.5 greenhouse gas, with the latest science finding that hydrogen emissions are 30-40 times more powerful at trapping heat over the following 20 years than carbon dioxide for equal mass, and 8-12 times more powerful over a 100-year period.^{9, 10, 11, 12} Hydrogen is also a very small, slippery, leak-prone molecule. Both of these factors combined mean that hydrogen emissions can significantly undermine the climate benefits of hydrogen use. For example, a recent study published by EDF considers the climate impacts of eight well-to-use hydrogen pathways in the industry, transport, and power sectors compared to the fossil fuel alternatives they intend to replace. The authors found that for blue hydrogen pathways, high hydrogen (i.e., 10% leakage) and methane emissions (i.e., 2.1% leakage) can yield an increase in warming in the near term by up to 50%, whereas low emissions decrease warming impacts by at least 70%. Even for green hydrogen pathways, upper-end hydrogen emissions (10% leakage) can reduce the climate benefits in the near term by up to 25%, emphasizing the importance of accounting for hydrogen emissions within CARB's LCA equation and requiring hydrogen leakage prevention plans be put in place.¹³
- 5. Incorporate the latest science on GWP values and time horizons: Both methane and hydrogen are potent greenhouse gases in the near term, as indicated above, and their emissions need to be accurately accounted for across dual time scales of global warming potential. The GWP20 value of methane is already reflected in the latest IPCC report, but there is now also scientific consensus around the warming potential of hydrogen. Four IPCC assessment reports (TAR, AR4, AR5, AR6) mention hydrogen's warming effects. The IPCC Third Assessment Report (TAR) cautions that "in a possible fuel-cell economy, future emissions may need to be considered as a potential climate perturbation."²¹⁰ Hydrogen's GWP100 values (based on its tropospheric effects only) are reported in the Fourth Assessment Report¹⁴ and Fifth Assessment Report.¹⁵ The Sixth Assessment Report identifies hydrogen leakage as a challenge that the industry must overcome.¹⁶ A recent multi-model assessment asserted high confidence in the quantification of hydrogen's warming effects and explicitly stated that the science is robust enough to be included in policy decisions and

⁹ https://acp.copernicus.org/articles/23/13451/2023/

¹⁰ https://www.nature.com/articles/s43247-023-00857-8

¹¹ https://www.sciencedirect.com/science/article/abs/pii/S0360319922055380?via%3Dihub

¹² https://www.nature.com/articles/s43247-022-00626-z

¹³ <u>https://pubs.acs.org/doi/10.1021/acs.est.3c09030</u>

¹⁴ IPCC Fourth Assessment Report (AR4), Working Group I, Chapter 2, 2.10.3.6 Hydrogen (2007)

¹⁵ IPCC Fifth Assessment Report (AR5), Working Group I, Chapter 8 Supplemental Material, 8.SM.14 Metric Values for Other Near-Term Climate Forcers to Support Section 8.7.2, pg. 23 (2013)

¹⁶ IPCC AR6 Working Group III, Chapter 6, 6.4.5.1 Hydrogen: Low-carbon Energy Fuel, pg. 657 (2022)

289.6 cont. tools.¹⁷ Based on these sources, a GWP100 value of 11.6 and GWP20 value of 37.3 can reliably be used for hydrogen, and a GWP100 value of 28 and GWP20 value of 84 can be used for methane.

A robust LCFS program is important for promoting the use of lower-carbon alternatives, including hydrogen. Therefore, it is crucial that LCFS incorporate rigorous standards and climate protections to ensure California can reap the greatest health, economic, and environmental benefits.

Feedstock Sustainability and Sustainable Aviation Fuel

For almost a decade, EDF has been working to reduce harmful pollution from aviation to mitigate climate change and deliver public health benefits 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).

Sustainable feedstocks are vital to the production of sustainable aviation fuel and play a significant role in California's efforts to effectively decarbonize the aviation sector. The following comments concern strengthening CARB's proposal to ensure the sustainability of feedstocks.

CARB should strengthen its proposal for sustainability certification of feedstocks

- 289.7 We appreciate the addition to section 95488.8(g)(1)(D) in January requiring attestation letters for specified source feedstocks, at each entity spanning the chain of custody from the point of origin to the fuel production facility. We also applaud the January addition of section 95488.9(g) requiring
 - 289.7a continuous third-party sustainability certification. However, the most recent iterations of proposed amendments to section 95488.9(g), in the current 15-day package and the August package, carve out an exemption from third-party sustainability certification for all specified source feedstocks.
 - 289.7b Where pathway applications concern true wastes, residues, and byproducts, we agree that in theory, the risk of overlooking adverse features is lower than for purpose-grown and -harvested energy feedstocks. That said, the question remains of ascertaining whether a feedstock truly is a waste, residue, or byproduct. The documentation elements listed in section 95488.8(g)(1)(B)-(C) of existing regulation would cover the essentials if all applicants and signatories always wrote the truth. Per the indicated process, however, chain-of-custody records, feedstock transfer documents, and the proposed attestation letters are to be maintained but not submitted until CARB Executive Officer or other verifier requests the information. As such, the existing documentation protocol relies largely on an honor system.

The reduced CI favors specified source feedstocks, and suppliers and/or fuel pathway applicants now have even more incentive than before to designate their inputs as specified source feedstocks with inaccurate sustainability features. If CARB is to successfully preempt fraud in the LCFS program, then

¹⁷ <u>https://www.nature.com/articles/s43247-023-00857-8</u>

289.7b such a broad category of materials should not receive an automatic waiver from third-party verification.

289.8 **Standardizing sustainability certification would help relieve the administrative burden**

We understand the desire to reduce administrative burden throughout the LCFS program where practicable. While claims made in pathway applications would be subject to audits under penalty of perjury, these fraud deterrence measures would come into effect only if a claim raises enough suspicion for CARB staff to actively investigate. In other words, most of the administrative burden for auditing specified source feedstock letters of attestation falls on CARB staff per the proposal. Even with the option to request that a 3rd party verifier handle the audit, such instances require that CARB staff first identify the case and then make a special request to the third-party verifier – all after applications have been filed and reviewed. In contrast, we recommend that the handling of specified source feedstock be included in section 95488.9(g) requiring third-party sustainability certification and attestation documents like for any other feedstock. Under such an LCFS regulation, the credentials of true wastes, residues, and byproducts would be obtained at the beginning of the process, thoroughly checked using purpose-built auditing infrastructure, and all in all, minimize the number of administrative steps on the desks of CARB staff.

Sustainability certification bodies like the Roundtable for Sustainable Biomaterials (RSB) already have standardized, consensus-built protocols and trained field specialists for auditing and verifying wastes and residues. CARB's proposed phase-in approach to sustainability requirements per section 95488.9(g)(5)-(7) allows for more than ample time to adapt to new requirements: from 2026 onward, pathway holders and applicants submit geospatial data of plot boundaries; from 2028 onwards no eligible feedstocks are sourced on lands converted after 2008; and mandatory third-party certification begins in 2028. Our recommendation would fit into this proposed phase-in timeline; section 95488.9(g) should ensure that wastes, residues, and byproduct designations are also third-party certified starting with the 2028 data year.

289.9 Updates to LCFS have nationwide implications for sustainable aviation fuel

The US Inflation Reduction Act (IRA) section 40B Sustainable Aviation Fuel (SAF) tax credit applies safe harbor to any candidate fuel demonstrating compliance with CARB LCFS verification. Each time the LCFS changes, so too does the floor for 40B stringency. In the event that the forthcoming 45Z credit guidance also relies on LCFS verification procedures, any weakening of LCFS stringency will open the door to large-scale unsustainable practices nationwide as well.

289.10 **CARB has a robust list of internationally recognized certification systems**

We support CARB's reference to the European Commission-recognized list of certification systems for the European Union Renewable Energy Directive (EU RED). In fact, Directive 2018/2001 has been updated with the amending Directive 2023/2413, which will be implemented by May of 2025. As such, CARB might consider a slight modification to 95488.9(g)(6)(C)(1), generalizing the wording to: "The Executive Officer will approve certification systems that have been recognized by the European Commission are eligible for the European Union Renewable Energy Directive (EU RED) 2018/2001 as

289.10 of December 31, 2025 per the European Commission's latest evaluation leading up to that date. cont. Approved certification systems will be subject to the reapproval requirements of section 95488.89(g)(58)(G); or ..."

289.11 **Procedures for forest biomass merit further exploration**

When it comes to forest waste biomass, EDF recognizes that many forests in the western U.S. are "overstocked," which increases wildfire vulnerability, particularly in a warming climate. In this context, there may be a need for clarification in the handling of biomass types derived from fuel reduction practices, including mechanical thinning and beneficial fire, which are essential for enhancing forest resilience.

We appreciate your consideration of these comments. EDF looks forward to continuing to work with CARB to update the LCFS. If you have questions or would like to discuss any of these recommendations, please contact Katelyn Roedner Sutter at <u>kroedner@edf.org</u>.

Sincerely,

Kat-fr Roedner Sutter

Katelyn Roedner Sutter California State Director



Submitted via electronic submittal: <u>https://ww2.arb.ca.gov/applications/public-comments?utm_medium=email&utm_source=govdelivery</u>

October 16, 2024

The Honorable Liane Randolph, Chair California Air Resources Board 1001 I Street Sacramento, CA 95814

Re: Comments on Second Notice of Proposed Low Carbon Fuel Standard Amendments (Second 15-Day Notice), released on October 1, 2024

Dear Chair Randolph:

290.1

Brightmark LLC ("Brightmark") appreciates the opportunity to submit comments on the Second Notice of Proposed Low Carbon Fuel Standard Amendments (Second 15-Day Notice) posted on October 1, 2024 ("Proposed LCFS Amendments"). We appreciate the California Air Resources Board (CARB) engaging with stakeholders regarding changes and updates to the Low Carbon Fuel Standard (LCFS) program.

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.

Establishing and maintaining market certainty has been a hallmark of the LCFS program. While the current Proposed LCFS Amendments modify the most recent changes to avoided methane crediting, making additional adjustments to the auto acceleration mechanism is needed to create more market uncertainty for certain low carbon fuel projects. <u>Brightmark strongly</u> recommends the AAM trigger begin as early as Q1 2025.

The Proposed LCFS Amendments' lower-than-needed CI targets risks continued stagnating prices eroding confidence and increasing investment uncertainty in the LCFS program.

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."


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.

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 1,100,000 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.

Proposed LCFS Amendments

290.2

Increases of credits in the bank in 2024 due to low targets and delayed rule implementation are causing downward price pressure needing immediate attention. In Q1 2024, the credit bank increased 2.4 million credits to a total of 26 million credits. The 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.

To address the current uncertainty in market pricing, we support CARB using the three main levers: (1) Carbon Intensity (CI) targets, (2) CI step-down, and (3) Auto Acceleration

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).



Mechanism (AAM) in the 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. CARB should also maintain the current regulatory structure for avoided methane
crediting and deliverability of low carbon fuels.
As stated in our August 27 th comments, a CI step-down target of 9%, coupled with a 2030 CI
target of 30%, will not adequately address the credit bank oversupply. To account for the credit
oversupply, Brightmark supports more aggressive CI targets and allowing the AAM to be
triggered as early as possible.
The delays in the regulatory amendment process have prevented the implementation of the
amendments. Because of the delay in LCFS rule implementation, the credit bank increases
through 2024 are not addressed in the CI targets and step-down proposals. It is imperative that

through 2024 are not addressed in the CI targets and step-down proposals. It is imperative that CARB implements measures 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.

290.5 If additional adjustments to the CI target and CI step-down are not considered, then CARB should implement an AAM as early as possible. Brightmark recommends the AAM trigger begin as early as Q1 2025. If the proposed CI target and CI step-down are adequate to help clear the credit bank oversupply, then an AAM will not be triggered. If however, the proposed CI target and CI step-down are inadequate, as many suspect, then have an AAM available as soon as possible will help alleviate any additional strain on credit prices by helping to clear the credit bank sooner.

As with California's Renewable Portfolio Standard program, the industry rises to the occasion with aggressive targets and the LCFS program's lack of aggressive targets is eroding confidence and increasing investment uncertainty.

In the first 15-day proposed LCFS amendments on August 12th, a new concept was introduced to reduce the number of 10-year crediting periods from three to two related to avoided methane crediting. We appreciate CARB adjusting this provision for projects certified before the effective date of this rule, as this would have been extremely problematic for projects that secured feedstock and financing agreements relying on an LCFS program that allowed for three 10-year crediting periods. The regulations should clarify that projects previously generating California Carbon Offsets should be automatically eligible for three crediting periods.

Focusing on Solving the Problem

290.6

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.

As was stated above, the success and market certainty of the LCFS program should be based on increasing the demand for credits, not limiting fuels and credit generation.

^{290.7} Brightmark supports the continued alignment of RNG deliverability requirements with those 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.

Brightmark also supports more efficient program operations and appreciates the inclusion of a full credit true-up, during the temporary pathway and annual true-up process, in the Proposed LCFS Amendments. However, we encourage changes to the "4-to-1" penalty for the case where a verified CI is higher than the certified CI. A more symmetric rule is needed for over and under performance, which can be impacted by a variety of external factors separate and apart from the facility itself. We recommend that, if the verified CI is higher than the certified CI, the project should simply repay CARB for any excess credits claimed, and not be subject to any further enforcement liability (unless there is malfeasance or other such cause). Projects should not be penalized unfairly and ensure that quarters while generating credits under the temporary pathway are exempt from the Verified CI Exceeded in Section 95486.1(g). In addition, more efficient program operations could benefit from allowing dairy RNG projects to account for actual lagoon cleanouts instead of imposing a required cleanout in the CI pathway calculations.

Market and Regulatory Certainty

290.10

The success of the LCFS to date shows the market's ability to deliver together in partnership with CARB. At its core, the LCFS should be a market-based, fuel-agnostic regulation that does not pick winners and allows all fuels to compete.

Market and regulatory certainty are based on trust in California as a reliable place to sell lowcarbon fuel and credits to meet and exceed climate goals. Markets with wide fluctuations between high and low prices are not sustainable. Sustained low price environments damage industries and erode confidence and incent investment in other markets. For CARB to promote a long-term, stable environment that encourages investment in new, and maintain existing, CIreducing projects more aggressive targets, through an AAM triggered as soon as possible, are needed. CI targets need to support credit prices to maintain a level for capital recovery of previous and future investments.

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



- 290.11 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.
- 290.12 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 helping 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



October 16, 2024

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 Low Carbon Fuel Standard Amendments Second 15-Day Period

Dear Chair Randolph and members of the Air Resources Board,

We appreciate this opportunity to provide feedback on the proposed amendments to the Low Carbon Fuel Standard second 15-day comment period published on October 1, 2024. We understand this is a complex subject and because of the implications, we appreciate CARB's attempts to get this right.

California Farm Bureau (CAFB) and family farmers have been long-time partners in helping California meet its climate goals and reducing emissions. We appreciate CARB's work to better understand our industry, including but not limited to engaging in the Dairy Workshop in Fresno in August.

We also appreciate CARB staff's work with our industry to encourage reductions where possible, and push our industry to be cutting edge, and do more to not only meet, but exceed our goals.

291.1 One area where California Farm Bureau remains adamant is regarding the continuation of the crediting for avoided methane. Dairy families and dairy families have been doing their piece, thanks in part to state investment into proven technologies like digesters, and AMMP to reduce emissions of critically important methane. Not only are dairy families meeting emissions goals, but exceeding them. The data shows, and is backed up by CARB's CADD data, that dairies are already heavily regulated, and remain regulated in terms of air quality and water quality. A pending Water Board general order regarding dairies will continue this and ensure that dairies remain stewards of the land, their neighbors, and community members.

Time and time again, dairy families are on the receiving end of mistruths from activists. Backed up by independent data, academic research, and CARB's own data, dairies do not worsen air quality and digesters do not increase the growth of dairies.



- 291.1 We ask that CARB continue its incentive-based approach, for the sole fact that it is working. At this time, there is no need to regulate dairies and doing so will 1) hurt hardworking community members and dairy families who already struggle to make a living in California, and 2) cause leakage to other less regulated states of emissions by moving dairy herds out of state. We appreciate the realization that regulating digester projects started prior to 2030 would be harmful to the market and reduce investment in future projects.
- ^{291.2} We thank CARB for extending its proposed deadline for credit generation for hydrogen produced fossil gas from 2030 to 2035. It is crucial that we keep all the tools in our toolbox and these extra years are crucial to ramp up the supply of hydrogen and make it into a viable economy.
- 291.3 The 2nd 15-day notice is an improvement from the 1st 15-day notice, however CAFB remains concerned about the limits applied to credit generation from agricultural lipid feedstocks. We've asked that all decisions be science based and CARB has traditionally been very strong in this category. However, when it comes to the feedstocks, the reasoning is void of technical or scientific reason for needing a limit or the proposed timeline. We feel strongly that the Carbon Intensity be the driving factor in making decisions. By limiting the use of certain fuels credit applications, CARB may be supporting the continued use of dirtier fuels and in turn, increased pollutants.
- ^{291.4} We thank CARB for aligning the description of biomass waste with local, state and Federal requirements.
- ^{291.5} We support a new CI for low-CI electricity produced by fuel cell from biomethane. It is crucial that as technology advances, we will be facing different and increased opportunities in the coming years than we see today. It is critical that we not tie our hands tomorrow in any decisions made today.

Sincerely,

Steven Fenaroli

Steven Fenaroli Political Affairs Director, California Farm Bureau



October 16th, 2024 California Air Resources Board 1001 I Street Sacramento, CA 95814

RE: Proposed Second 15-Day Changes to Proposed Regulation Order

Dear CARB Board,

We appreciate the opportunity to provide comments on the second 15-day proposed changes that were recently shared by staff. These changes come at a critical point in which environmental stakeholders such as EnviroVoters had hoped to see substantial changes to the proposed amendments ahead of the Board vote in November. The LCFS rulemaking is ripe with potential to make critical updates to the program, and we are concerned that the trajectory of these amendments goes in the wrong direction.

The process for feedback has yielded rich discussion on how to advance the LCFS in a manner that suits our climate goals and reflects upon lessons learned. In short, we are disappointed that the salient asks shared by environmental, EJ, and labor groups went largely unaddressed as the rulemaking comes to a close. Including the changes from this second 15-day changes period, the program fails to deliver on several fronts.

292.1 The rule does not provide resolution to dairy-adjacent communities seeking an improvement in air and water quality standards. Staff has shared that some aspects of dairy-related air quality issues must be resolved through local air quality and water quality boards, and we acknowledge that this is a multi-pronged effort. However, we are concerned that the extended lifetime of dairy digesters incentives doesn't do much to substantially reduce methane at the source. It is also worth noting that this binds California to continued subsidization of major expenses, which will only grow over time as more digesters are built within the optimal window to capitalize upon crediting periods. Testimony from impacted community members during this rulemaking speaks to the profound impact poor air quality has on public health. We can't lean on an incentives-only, digester-centric approach as chronic health issues persist. Digesters are not without their flaws. Mitigating methane from the state's biggest contributor should be faced with a comprehensive strategy. We urge the Board to consider a timely rulemaking process for the dairy methane rule in addition to scrutinizing the over-crediting of dairy biogas.

Furthermore, it is deeply unsatisfactory that these amendments do not act on jet fuel or marine fuel, both of which would have strengthened the program's ability to thoroughly decarbonize the transportation sector. The LCFS is not a fledgling program, and where possible, we must fold additional sectors into the rule. This is a missed opportunity to broad our transportation emissions strategy, especially regarding marine fuel. The momentum for zeroemission transition is clearly reflected by industry and market activity. We also can't afford to pass up on an additional opportunity to ease the air quality burden facing port communities.

- 292.3 Lastly, **despite broadening the feedstock types included in the updated biomass-based diesel provision, this is <u>not</u> comprehensive enough to solve the major issues**. We remain concerned that relying greatly on these fuels will have substantial impacts to global hunger and deforestation.
- 292.4 To further comment on process concerns, we are alarmed that very little of the EJAC's eightpoint resolution has been integrated into the proposed amendments. In both iterations of the 15day changes, we see nods to stakeholder comments but none to the EJAC's thorough history of feedback. We hope to see further utilization of resources provided by EJAC in rulemakings with robust discussion about impacts to environmental justice communities.
- 292.5 It is deeply discouraging that the opportunity to update the LCFS program has been resolved with insubstantial amendments. It is similarly disappointing that there is no clear path forward for the legitimate concerns raised by impacted community members, which we believe could have been acted on during this rulemaking.

Regards,

Hungon Mohabi

Gracyna Mohabir Clean Air and Energy Regulatory Advocate **California Environmental Voters**



October 16, 2024

Chair Liane Randolph & Members of the Board California Air Resources Board 1001 I Street Sacramento, CA 95814

Via electronic submission

Re: Second 15-Day Changes to the Proposed Regulation Order

Dear Chair Randolph and Members of the California Air Resources Board:

The North Dakota Soybean Growers Association (NDSGA) appreciates the opportunity to comment on the proposed modifications (Second 15-Day Changes) to the Low Carbon Fuel Standard (LCFS) program. The American Soybean Association (ASA), our national policy organization, has welcomed engagement with the California Air Resources Board (CARB) and staff throughout this multi-year process to update the LCFS program.

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.

- 293.1 CARB's Second 15-Day Changes to revise the LCFS did not address our major concerns with provisions included in the August 15-day notice nor did it provide additional clarification or detail related to sustainability reporting requirements for agricultural feedstocks. We do appreciate the additional flexibility related to virgin vegetable oil feedstock limitations, by extending the compliance deadline to January 1, 2028, for all approved pathways at the date of adoption. However, additional feedstock limitations included in the Second 15-Day
 293.4 Changes document could further limit soybean oil market share in California, when compared to the August proposal.
- 293.5 In addition to the new proposals in the Second 15-Day Changes package, NDSGA remains deeply concerned with the drastic pivot CARB has made in the past few months related to agricultural feedstocks used for biofuels. We continue to encourage that updates to the LCFS program are based on science, as required by AB-32.

Amended Feedstock Cap Considerations

NDSGA has significant concerns with the virgin vegetable oil feedstock cap that was included in the initial 15-293.6 Day Changes posted in August, especially after CARB itself noted that a cap will increase the utilization of petroleum diesel. The current proposal limits, or caps, the amount of soybean oil that is allowed to generate credits in the program at an arbitrary 20%. Now, CARB is expanding on this cap in its Second 15-Day Changes

- 293.6 with the inclusion of sunflower oil. Adding additional feedstocks to the 20% aggregate cap will further limit market access for soybean oil and additional gallons of low-carbon fuels.
- Based on CARB's own analysis, a cap on credit generation for vegetable oil feedstocks will lead to an increase in fossil diesel use compared to the status quo. While NDSGA agrees that all feedstocks entering the California LCFS market should maintain fidelity to the assumptions underlying their life-cycle assessment (LCA), domestic agricultural feedstocks are facing a redundant, triple penalty through an outdated indirect land use change (ILUC) score, stringent sustainability reporting requirements, and a proposed arbitrary cap on credit generation while all other feedstocks, including imports, do not face the same restrictions.

293.8 The proposed cap increases soy's carbon intensity (CI) score for amounts over the cap from the established pathway, which is based on science, to the benchmark CI, which is not based on an LCA for soy. This is effectively increasing soy's ILUC score by upwards of 50% for many pathways without a scientific basis. In fact, CARB has refused to use new data related to ILUC while at the same time effectively increasing it by an arbitrary amount.

- 293.9 The increase in ILUC for ag feedstocks above the 20% threshold will effectively shut them out of the LCFS.
 293.9 Biomass-based diesel provides GHG and emissions benefits that are unpriced by the market. As a result, they cost more to produce than they can be sold for and rely on policy to account for these benefits. Without the credit generation, soy will not be able to compete against waste feedstock imports, thereby capping use in the LCFS.
- 293.10 North American agricultural feedstocks for biofuel production are already held to a high standard for participation in the Renewable Fuel Standard (RFS) and the Canadian Clean Fuels Regulations. Rather than adding additional sustainable North American feedstocks to its arbitrary proposed cap, CARB should consider
- 293.11 updating carbon intensity analysis and oversight of imported feedstocks, which are not held to the same level of accountability.
- While NDSGA is steadfast in its opposition to the virgin vegetable oil feedstock cap and the rationale used to reach this conclusion, the Second 15-Day Changes added some additional flexibility to come into compliance with the arbitrary cap. We appreciate CARB's acknowledgement that biofuel production facilities cannot shift production overnight, and thank CARB for updating the grandfathering clause to provide a 2028 compliance date for all approved pathways in the LCFS program.

Carbon Intensity Scoring and Auto Acceleration Mechanism

NDSGA remains concerned that without a comprehensive update to the Global Trade Analysis Project model for biofuels (GTAP-BIO) that CARB utilizes, soy-based feedstocks will be phased out of the LCFS even without the additional limitations being proposed in the Second 15-Day Changes. Current data indicates a much lower CI score for soybeans, as growers continue to improve soil practices, limit water use, lower on-farm emissions and more. On the one hand, CARB is recommending stringent sustainability guardrails for U.S. soy, but on the other hand is still on track to likely phase-out soy-based biofuels from credit generation by approximately 2035 or sooner.

As CARB looks to develop a more aggressive auto acceleration mechanism to reach CI reduction benchmarks sooner, using outdated methodologies will only limit the output of actual improvement over time in terms of emissions reductions. As CARB updates all other major lifecycle emissions models through this rulemaking, we

- 293.13 once again urge action to update the GTAP-BIO model so that the most current, science-based data may be cont. used to determine carbon intensity reductions.
- In terms of updating the timeline for analysis of data to trigger the auto acceleration mechanism, NDSGA appreciates that CARB is seeking to provide additional notice to the market before a trigger is implemented 293.14 through the ability to analyze data quarter over quarter rather than just annually. This will allow the industry more time to plan and make business decisions ahead of new benchmarks triggering.

Sustainability Guardrails and Traceability Concerns

NDSGA remains very concerned about the sustainability guardrails. The sustainability guardrails are more onerous than the specified source requirements used for waste feedstock imports. Palm oil in Southeast Asia 293.15 has had forced labor concerns¹, but CARB does not require used cooking oil derived from palm to track social or economic sustainability. Concerningly, petroleum also does not have to track these criteria. CARB's proposal makes it administratively easier to use non-sustainable petroleum² in the state than biofuels that have lower CI scores and are produced from sustainable feedstocks grown in the United States. Land use change is already 293.16

captured in the ILUC score, which makes it unclear what purpose the guardrails serve.

The Second 15-Day Changes offered a bit more detail about how CARB plans to implement its reporting and requirements in terms of traceability, but we continue to have serious concerns about how this proposal will

work in practice. By way of background, soybean products pass through many hands before final use. A 293.17 soybean is produced, potentially transported to a grain elevator, then must reach a soybean processor to be separated into soybean oil and soybean meal (crushed). The meal and oil can then be delivered to end users. Because of this, ensuring the identity preservation of a soybean is not easily accomplished. Soybeans are a bulk commodity, and infrastructure in the U.S. was not developed to segregate subunits of the crop. This bulk handling system based on comingling is one of the inherent advantages the United States has as it reduces transportation costs, and subsequently on-ground emissions.

CARB's proposal states that farmers will have to declare the geographical shapefiles or coordinates of farm boundaries starting in 2026. This raises many issues including the definition of a farm and how grain must be

traced and reported if harvested from several fields but comingled at storage. While the deforestation 293.18 requirements do not start until 2028, the questions posed above are relevant for the attestations starting in 2026. At that point, farmers will have to declare the boundaries of their farm. CARB settling on one definition for 2026 and another for 2028 would create much confusion. Educational efforts will be needed ahead of 2026. Once farmers understand the program, it will be very difficult to change fundamental definitions.

While 2026 may seem like plenty of time, it is much less for farmers in practice. Soybeans available starting at the beginning of 2026 are from the crop harvested in the fall of 2025 and planted in the spring of 2025. Farmers are purchasing inputs for that crop currently. If delivery points for the next soybean crop require data disclosure, producers need to know that now as they plan out their upcoming crops and lock in investments. So, if new LCFS regulations are not finalized until January 2025 and planting begins in March 2025, it leaves virtually no planning time for a farmer to update practices to adhere to these new attestation requirements.

If CARB insists on agricultural feedstock traceability, then it should reward sustainable practices beyond what is 293.19 already assumed in the LCA. For instance, some soybeans are double cropped meaning they are grown as a

¹ https://apnews.com/article/virus-outbreak-only-on-ap-indonesia-financial-markets-malaysia-7b634596270cc6aa7578a062a30423bb

² https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2022.858512/full

293.19 secondary crop following a primary crop within a growing season. They are not displacing other crops or land uses. Double-crop soybeans should be eligible to have the ILUC component of the CI score removed, or at least shared with the other crop in the rotation.

Entities Eligible to Apply for Fuel Pathways

NDSGA is concerned about CARB's proposal to give the Executive Officer the discretion to stop accepting new pathways for biomass-based diesel starting in 2031. We do not understand how this benefits the LCFS. Under AB-32, CARB must under statute minimize costs and maximize GHG reductions. It is unclear how this is served by rejecting new pathways. In fact, the LCFS is best served by allowing the most available pathways. If these pathways cannot achieve cost-effective GHG savings, they will not be utilized by the market in the LCFS. In essence, an increase in pathways can only serve to improve GHG benefits in California. Singling out a single fuel for prejudicial treatment is baffling given the goals of the LCFS and the authority that establishes it.

Recommendations to CARB

293.21 As CARB finalizes its update to the LCFS, NDSGA aligns itself with ASA recommendations that will likely prevent an increase in fossil diesel use, improve carbon intensity calculations, and improve market access for sustainable agricultural feedstock providers.

First, CARB should not apply the vegetable oil feedstock cap proposal to North American feedstocks. As noted above, these feedstocks are already subject to guardrails to ensure production on land that has not been converted since 2008. The RFS was designed specifically to prevent land conversion for biofuel production, and U.S. Department of Agriculture (USDA) data shows a decrease in farmland over the same period.

Second, CARB should convene an expert working group to consider issues related to the sustainability provisions and indirect land use change. CARB has utilized working groups in the past to analyze complex issues related to the LCFS and this is no different. Through meetings with CARB staff and board members, decisions are being made using competing schools of thought. Gathering experts to coalesce around an agreed upon science-based approach moving forward would ensure that CARB is utilizing the best information available. We recommend that this expert working group convenes in 2025 and provide recommendations by October 2026.

Lastly, CARB must undertake a comprehensive update of the GTAP-BIO model for soybean oil used in biofuel production. Without using the most up-to-date and accurate data, CARB is doing a disservice to the feedstock producers and California's citizens by calculating carbon intensity scores not rooted in current fact. Through CARB's own analysis we know that basing decisions off old data will lead to more—not less—emissions in the California transportation sector.

Conclusion

- 293.25 NDSGA is encouraged by the continued successes of programs that support the development of cleaner, lowcarbon fuels. However, it is critical that CARB finalizes updates in a way that does not arbitrarily exclude agricultural feedstocks through policies that are not science-based and run afoul of CARB's mandate, including
- 293.26 capping vegetable oil feedstocks and applying onerous sustainability guardrails that add cost without rewarding farming practices that lower Cl.

293.27 CARB's Second 15-Day Changes did not address any of the fundamental issues raised by soybean farmers in
 293.28 the first 15-Day Changes and fails to acknowledge the potential unintentional consequences of a feedstock outlined by its own employees only a few months before. CARB is required under the law to achieve the
 293.29 maximum technically feasible and cost-effective reductions in GHGs. The two most recent 15-Day Changes show a lack of willingness to achieve the statutory obligations set forth in AB-32.

NDSGA is eager to continue working with CARB to support the role of agriculture in diversifying the fuel supply while reducing GHGs and increasing clean air 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.

North Dakota soybean producers are eager and willing to be part of the solution to address air quality and climate change. With our strong commitment to supporting American industries, jobs and families our producers are uniquely positioned to play a major role and are able to have verifiable climate and conservation practices as part of that solution, unlike imported used oil products. North Dakota soybean producers take pride in producing quality products and continue the long-established legacy most of our farms have built up over several generations. Being able to help meet the low carbon fuel demands is yet another proud way North Dakota soybean producers can continue their tradition of conservation and protecting the soil and long-term viability of their family legacy.

Sincerely,

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Justin Sherlock President, North Dakota Soybean Growers Association



October 16, 2024

The Honorable Liane Randolph, Chair California Air Resources Board 1001 I Street Sacramento, CA 95814

Re: <u>Comments on Second 15-day Language to Amend the</u> <u>Low Carbon Fuel Standard</u>

Dear Chair Randolph:

I am writing on behalf of the Bioenergy Association of California to comment on the second 15-day language to amend the LCFS. These comments focus on two issues in the new 15-day language that should be corrected before the Board adopts the final
 changes. First, the different definitions of forest waste biomass are confusing, exclude some types of waste biomass, and may slow the beneficial use of forest waste to produce low carbon fuels. And second, the regulations should include linear generators in addition to fuel cells or other non-combustion technologies. BAC continues to have serious concerns about the phaseout of avoided methane credits and the ongoing use of Book and Claim for undelivered biomethane, but we addressed those issues in our August 27 comments.

BAC represents about 100 members that are converting organic waste to energy to meet the state's clean energy, climate change, wildfire reduction, landfill reduction, and clean economy goals. BAC's public sector members include cities and counties, Tribes, air quality and environmental agencies, waste and wastewater agencies, public research institutions, environmental and community groups, and a publicly owned utility. BAC's private sector members include energy and technology companies, waste haulers, agriculture and food processing companies, investors and consulting firms, and an investor-owned utility.

BAC's comments on the second 15-day language are below.

1. Proposed Definitions of Forest Biomass Waste

The second 15-day language appears to include broader and more inclusive definitions of forest biomass waste, but the revised definitions may still exclude or cause

uncertainty for several types of forest biomass waste, which in turn will slow efforts to convert that waste to low carbon fuels. BAC urges CARB to make two additional changes that would remove contradictions and uncertainty without weakening any of the sustainability criteria in the definitions.

A. Section 95481(a) - Definitions

294.5 The definition of "Forest Biomass Waste" in this section excludes biomass that does "not meet regional minimum marketable standards for processing into wood products." The problem is that "wood products" is not defined in the regulations and could be interpreted to include anything made from wood, which would include biochar, mulch and wood chips. Virtually all forest waste can be converted to biochar and most of it can be converted to mulch and wood chips, so the exclusion of biomass that can be converted to other wood products effectively excludes all forest biomass waste.

This can be corrected by either 1) putting a semicolon after the word "branches" instead of a comma or 2) changing the "and" after the word "branches" to "or" so that the wood products exclusion only applies to whole logs.

- B. <u>Section 95488.8(g)(1)(A)</u>
- BAC strongly supports the additional language in this section that specifies that forest biomass waste is biomass that is removed for "wildfire fuel reduction, to reduce the risk to public safety or infrastructure, to create defensible space, or for forest restoration." However, the next clause of this same section undermines these specified goals by excluding clearcutting in all cases, even though that is often the method needed to create defensible space or fire breaks to stop catastrophic fires.

This can easily be corrected by either 1) changing the "and" at the beginning of the second clause to an "or" or 2) by clarifying that clearcutting is only allowed when necessary for wildfire mitigation or forest health.

These two changes will help to remove contradictions and uncertainty that will otherwise slow efforts to convert forest biomass waste to low carbon fuels.

2. Need to Include Linear Generators as a Non-Combustion Technology

294.2 BAC is also very concerned that the second 15-day language explicitly includes fuel cells in at least two places, but does not include linear generators. Like fuel cells, linear generators can provide non-combustion conversion of renewable gas – biomethane, biogas or hydrogen – to electricity with virtually no emissions. Linear generators using renewable fuels are now RPS eligible pursuant to AB 1921 (Pappan, 2024) and should be included in the LCFS as well.

- BAC urges the Air Board to add linear generators to the two sections that specifically cont. BAC urges the Air Board to add linear generators to the two sections that specifically mention fuel cells or to replace the term "fuel cells" with "non-combustion conversion technologies such as fuel cells or linear generators." This change should be made to the two sections below and anywhere else that lists fuel cells as an eligible technology.
 - A. 95488.8(i)(2) "staff proposes to allow for book-and-claim accounting of biomethane to produce electricity for electric vehicle charging, provided the electricity is generated using a fuel cell, linear generator, or other noncombustion technology."
 - B. 95488.9(b) "staff proposes to add a new temporary CI for low-CI electricity produced by fuel cell or linear generator from biomethane from dairy and swine manure, based on existing program data."

Thank you for your consideration of these comments.

Sincerely,

Julia a. Fer-

Julia A. Levin Executive Director



October 16, 2024

Ms. Rajinder Sahota Deputy Executive Officer - Climate Change & Research California Air Resources Board 1001 | Street Sacramento, California 95814

Dear Ms. Sahota:

Thank you for the opportunity to comment on Second 15-Day proposed changes to California's Low Carbon Fuel Standard (LCFS) Amendments.

Acelen Renewables is committed to driving the energy transition through innovative, sustainable, and competitive energy solutions. We plan to produce up to 20,000 barrels per day of sustainable aviation fuel and renewable diesel by 2027, while developing a novel feedstock – a native Brazilian species called Macauba – which is highly productive in terms of oil yield and will be grown on degraded soils, allowing our project to minimize indirect land use change (ILUC) and maximize the carbon intensity (CI) reduction potential. Our company is fully committed to more sustainable practices from seed to fuel, with a focus on compliance and full traceability across the value chain and reduced water and energy consumption during production.

295.1 While Acelen Renewables commends and shares the aims of the California Air Resources Board (CARB) to drive more aggressive decarbonization across the transportation sector, we were disappointed by the Agency's decision *not* to address the broad concerns expressed by not only the American Biofuels Association, but dozens of other participants in the renewable diesel supply chain, regarding the 20% production limit on renewable diesel produced from soy and canola oil. Adding sunflower oil to the feedstocks subject to the 20% limit perpetuates what we think is a misguided policy, intended to limit renewable diesel production based solely on the feedstock.

Picking winner and loser feedstocks casts aside the key tools that both California and the Federal government have developed and updated to determine the life-cycle emissions of fuels, with a strong indirect land use change as a primary component. It also discourages innovation from being developed and deployed that would lower the indirect land use change (ILUC) impacts from these feedstocks.

As such, we suggest CARB remove the 20% limit altogether, rather than adding new feedstocks to it, and rely instead on the new sustainability provisions in the amendments package and continued refinement of the ILUC factor in the CA_GREET model, providing



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www.acelenrenovaveis.com.br





technology and feedstock agnostic policy environment wherein carbon intensity scores speak for themselves, and the best solutions rise to the top.

- ^{295.2} We also support CARB's formation of an expert stakeholder advisory committee to further explore how energy-producing crops and forest waste biomass can be produced in the most sustainable and environmentally sound manner possible to produce the lowest carbon-intensive biofuels that meet the leading-edge LCFS program's goals.
- ^{295.3} Finally, we want to support the directive from CARB Board members to staff at the September 12, 2024, joint hearing of the Board and Environmental Justice Advisory in seeking a regulatory pathway for alternative jet fuel in the LCFS regulation. We strongly support a policy that incentivizes the production and utilization of alternative jet fuel in California, and we believe the LCFS regulation enables both goals. We specifically support the directive from several CARB board members that the state must continue to work towards the development of this policy. We would hope that CARB staff can lay out a regulatory plan at the November 8, 2024 Board meeting for alternative jet fuel in response to the board members' guidance.

Thank you for the opportunity to comment on these additional modifications to the LCFS amendments. We would be proud to help California achieve its LCFS and overall climate change goals, and hope that the current amendments to the LCFS can be adjusted to encourage the significant investments that we, and our capital partners, are prepared to make to get us all to a cleaner and more sustainable future.

Respectfully submitted,

Marcelo Cordaro Chief Operating Officer MARCELO HAMDRO (OKDARO

Acelen Renewables



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VIA ELECTRONIC POSTING

https://ww2.arb.ca.gov/lispub/comm/bclist.php Comment List: lcfs2024

October 16, 2024

Clerk of the Board California Air Resources Board 1001 | Street Sacramento CA, 95814

Dear Chair Randolph and Board Members:

296.1 296.2 296.3

296.4

Kern Energy (Kern) is providing comments on the California Air Resources Board's (CARB) proposed amendments to the Low Carbon Fuel Standard (LCFS) regulation released on October 1, 2024. Kern is specifically providing comments on the following: (1) Restricting Feedstocks for Biomass-Based Diesel is Contrary to LCFS Program Goals; (2) Sunsetting Credit Generation for Hydrogen Restricts Space for Innovation; and (3) Near-term Increase in Program Stringency is Excessively Aggressive.

Kern Energy is an independent, family-owned and operated transportation fuel company in the Southern San Joaquin Valley that has proudly fueled California for 90 years. At a capacity of 26,000 barrels per day, Kern is the only refiner producing both gasoline and diesel between the major refining complexes in the Bay Area and Los Angeles. While California is one of the most challenging operating environments in the world for a small refiner, Kern has thrived while many others have failed. As a renewable fuel pioneer, Kern understands what is needed to address California's climate and environmental concerns. Kern embraced the challenge presented by California's LCFS and the federal Renewable Fuel Standard, becoming just the second refinery in the U.S. to produce renewable diesel by co-processing bio-feed and the first small refiner in California to blend biodiesel. Kern has been an active participant in the development and evolution of the LCFS since program inception, both actively engaging in the policy-making process and reliably serving the California market as a provider of liquid transportation fuels meeting California's strict standards. Kern appreciates CARB Staff's tremendous work throughout the rulemaking process, particularly for demonstrating the significant contributions that lower CI liquid fuels have delivered toward achieving the state's climate goals and the continued need for these fuels for many years to come. It is critical that any changes to the LCFS support logical and attainable CI reduction targets while continuing to incentivize fuel producers

Kern Energy October 16, 2024 Page 2 of 5

like Kern to ensure the reliable delivery of ever cleaner and lower carbon transportation fuels to our communities.

296.1 cont.

1. Restricting Feedstocks and New Pathways for Biomass-Based Diesel is Contrary to LCFS Program Goals

In the first 15-day package released in August 2024, Staff proposed adding new subsection 95482(i) to "provide credits for biomass-based diesel produced from virgin soybean oil and canola oil for up to 20 percent of annual biomass-based diesel" and impose the carbon intensity of the applicable diesel pool benchmark to volumes of fuel produced from these feedstocks in excess of the limit. Packaged as a crediting opportunity rather than the restriction it is, Staff is now proposing to add sunflower oil to the list of restricted feedstocks, further limiting renewable fuel producers' ability to supply needed low-carbon liquid fuels to the market. Placing this cap on feedstocks eligible for crediting will handicap renewable fuel producers' abilities to diversify their feedstock portfolio, creating additional strain on already tight waste feedstock markets and prices and imposing unnecessary uncertainties of feedstock supply.

Kern appreciates the additional runway that Staff is proposing in the second 15-day package, revising the grandfathering mechanism for these identified crop-based feedstocks. Moving away from past production as the qualification to instead allowing for existing certified pathways or pathway applications submitted by the effective date of these changes is pragmatic and helpful. Kern strongly encourages CARB to reconsider extending the proposed January 1, 2028, implementation date for grandfathered facilities. Three years gives only a narrow window to adjust feedstock portfolios and secure sufficient additional volumes to replace these restricted sources. This will create yet another period of intense competition for limited supply of waste oils/fats available again creating immense strain and competition in the market.

Kern has made significant and successive investments in its facility over the years to produce increasing amounts of renewable diesel. Waste feedstocks have become increasingly competitive to source, particularly those higher-quality feedstocks without the need for additional pre-treatment. These conditions will become more severe as additional renewable diesel production capacity comes online. Placing a limit on the amount of any given renewable feedstock could jeopardize Kern's ability to maintain production volumes of lower CI renewable diesel as tallow and waste fats/oil supply become impossible to source. Kern was encouraged during the April 2024 public workshop when Staff acknowledged that renewable and conventional liquid fuels will continue to play a key role in the state's transportation fuel mix for many more years, particularly in the medium and heavy-duty sectors and even as California expands to additional and newer energy sources. Kern acknowledges CARB's preference to prioritize waste feedstocks over Kern Energy October 16, 2024 Page 3 of 5

^{296.1 cont.} food-based crop-derived feedstocks, but this proposal is another attempt at picking winners and losers rather than letting the market set the signal.

This proposal to limit liquid renewable fuels is contrary to the agency's stated goals of lowering the carbon intensity of California's transportation fuel pool. CARB should let the market dictate demand for biomass-based fuels, which would naturally follow the actual progress of ZEV adoption rather than setting arbitrary dates around hopeful ambition. Kern's position remains that the proposed addition of Subsection 95482(i) is unnecessary and should be eliminated from the final regulatory amendments. At a minimum, the 2028 grandfathered implementation date should be pushed out three years to afford producers sufficient time to plan and react to such a significant change.

296.2 cont. 2. Sunsetting Credit Generation for Hydrogen Eliminates Space for Innovation

In the first 15-day package, Staff proposed to add a new subsection 95482(h) to remove LCFS credit generation eligibility for hydrogen produced using fossil gas as a feedstock, effective January 1, 2031. Kern's previous comments expressed opposition to this addition and encouraged CARB to take a comprehensive, inclusive approach to meeting the hydrogen needs of a clean energy future. Kern appreciates Staff's reconsideration and extension of the sunset date to 2035 by adding a runway allowing some crediting from 2031 to 2034. Nonetheless, these new provisions continue to pick winners and losers rather than allowing space for innovation and inclusive solutions.

CARB has consistently acknowledged the need and support for advanced technologies, and a broad portfolio of fuels to meet the state's climate goals. While the projected operational timeline for projects funded under the hydrogen hubs grants may appear to support expanded hydrogen production in California, the elimination of a viable, immediately available option before these projects have been realized is short-sighted and stifles the very innovation that has historically fueled California.

The production of fossil hydrogen with carbon capture and/or other advanced technologies should be seen as a positive contribution to expanding the supply of low-carbon hydrogen in California, able to supplement production via steam electrolysis, biomass gasification, and steam methane reforming of biomethane. Kern does not utilize steam methane reformers to make hydrogen from fossil gas. Instead, Kern's refining operation produces hydrogen as a byproduct from our gasoline production facilities. Currently combusted onsite as fuel gas in industrial heaters, Kern is actively working with innovative partners on an advanced technology that would capture this hydrogen for use in on-site fuel cells to produce electricity – that is, replacing electricity from cogeneration and the state's grid with zero CI electricity produced on-site by effectively using this existing energy source. Further, use of this captured hydrogen would allow for the replacement of diesel-powered engines

Kern Energy October 16, 2024 Page 4 of 5

296.2 cont. in fixed generators and mobile equipment with clean hydrogen-fueled internal combustion engines or hydrogen-powered fuel cells, supporting the move to zero-emission applications in the heavy duty and industrial sectors.

CARB must remain open to a broad array of technologies and avoid adopting policies that stifle innovation with the imposition of arbitrary timelines. Imposing barriers and prohibitions to the mobilization of existing industry and infrastructure only serves to hamper the development of key solutions and discourage contributors focused on improving our shared climate improvement goals. Kern again urges CARB to eliminate this new subsection before final approval of LCFS amendments.

296.3 cont. 3. Near-term Increase in Program Stringency is Excessively Aggressive

Staff remains committed to the August 2024 proposal to modify Section 95484 (d) through (f) with an immediate increase in stringency to a 9% CI reduction in 2025, nearly double the 5% year-to-year increase presented in the initially proposed December 2023 amendments. This increase is additive to adjusting the overall CI reduction goal to 30% by 2030 and proposing the addition of an auto-acceleration mechanism that would accelerate the annual CI target by a year when specified market conditions are triggered. Staff note this change as intended to smooth the curve between the 2025 compliance target and the originally proposed 30% reduction in 2030, yet the effect is to create an immediate, near impossible burden to comply. While not specifically addressed in the second 15-day package, Kern is emphasizing its previous comments about this aggressive and immediate reduction to the annual CI, given the severity of the impact.

Kern is one of the smallest refineries in California and is one of only two remaining small refineries in the state producing finished transportation fuels. California Energy Commission data indicates that roughly 30 years ago a dozen small refineries operated in the state. The demise of over 80% of California small refiners over the last 30 years is due in large part to exponentially expanding regulatory burdens and accompanying compliance costs, which disproportionately harms small businesses. Using today's near-record low credit prices in the carbon market, Kern's estimated cost to comply with the newly proposed 10 g/MJ decline (9% stringency proposal) is greater than \$13 million for 2025 alone – more than double Kern's estimate under the previous 5% stringency proposal. These single-year cost-to-comply estimates using current carbon credit prices should be seen as conservative, if not the minimum cost for Kern to comply. The agency's desired result from the layered stringencies in this regulatory action is to drive up the price of carbon, which leaves these compliance estimates nowhere to go but up. Kern expects to see these costs double again if/when the market responds to CARB's signal. Kern Energy October 16, 2024 Page 5 of 5

296.3 cont. This additional increase has the effect of front-loading 2025 with an unreasonable compliance burden to refiners with little to no time to prepare, rather than spreading the burden across the full five years to 2030. The CI benchmark for gasoline in 2024 is 87.01 grams CO2 per megajoule (g/MJ). Under the 5% increased stringency scenario initially proposed in the 45-day package, this benchmark would drop to 80.55 g/MJ – a 6.46 g/MJ difference. Under the 9% stringency scenario currently proposed, this benchmark would drop to 76.6 g/MJ – an astounding difference of more than 10 g/MJ. CARB cannot expect refiners to adjust to this dramatic change in less than four months. To place additional context around the magnitude of this CI reduction, even under the current proposal, the next time a benchmark CI decline of 10 g/MJ would be realized is in six years.

CARB is creating an impossible feat for regulated parties to comply even as the agency acknowledges the need for liquid fuels to meet state demand for many years to come. The LCFS proposed amendments already create a layering effect with the incorporation of the auto-acceleration mechanism, limitations to biomass feedstocks, and disincentives toward biomass-based diesel fuels. The longer runway associated with the 5% stringency allows fuel producers the time needed to continue advancing new technologies and innovations in ultra-low CI fuels and implementing projects that are already underway but take five or more years to engineer, construct, and commission. Kern understands that Staff may envision smoothing the curve as beneficial, but the reality is an opposite and detrimental effect. Kern supports requiring reductions in a ratable manner.

Kern urges CARB to recognize the disproportionate regulatory impact on small refineries and consider ways to alleviate that burden. As a smaller company operating a single facility, Kern is less able to absorb regulatory costs. Notably, reduced costs create opportunities to utilize funds for reinvestment in the facility and expanding a low-CI fuel portfolio – investments that are critical for Kern's long-term operation and success and critical to meeting the state's climate goals.

In conclusion, Kern appreciates CARB's consideration of Kern's comments. As always, Kern is committed to working with Staff throughout this regulatory process. Please do not hesitate to reach out to me at (661) 845-0761 with any questions.

Sincerely,

Melinda Palmer VP – Regulatory & Public Affairs Kern Energy



October 15, 2024

California Air Resources Board 1001 | Street Sacramento, CA 95814 VIA Electronic submittal through CARB portal

Re: Valero Renewable Fuels Company, LLC Comments on Second 15-Day Low Carbon Fuel Standard Amendments Package

Dear Sir/Madam:

Valero Renewable Fuels Company, LLC ("VRF") appreciates the opportunity to provide comments on the proposed California Air Resources Board ("CARB") Second 15-Day Changes to the Proposed Low Carbon Fuel Standard ("LCFS") Amendments (the "Second Change"). VRF is the owner and operator of 12 ethanol plants in the United States with an annual production capacity of approximately 1.6 billion gallons of ethanol. VRF sells its ethanol into California, as well as other low carbon markets in the U.S. and around the world. As one of the nation's largest producers of ethanol, and with its experience both in California and globally, VRF offers the following comments for CARB's consideration.

Second Change Proposed Section 95488.9(g)(4)

297.1

In Section 95488.9(g) of the proposed Low Carbon Fuel Standard Amendment ("LCFS Amendment"), CARB lists several sustainability requirements that ethanol producers holding a pathway must meet (referred to herein as the "Sustainability Criteria"). In Section 95488.9(g)(4) of the Second Change, CARB proposed to assign to ethanol the same carbon intensity ("CI") value assigned to California Reformulated Gasoline Blendstock for Oxygenate Blending ("CARBOB") for any volume failing to meet the Sustainability Criteria. Under the LCFS Amendment, the first of the Sustainability Criteria requirements begins with the 2026 data year and, by the year of 2031, all Sustainable Criteria requirements must be met.¹ In VRF's experience, only a small subset of farmers currently engage in audited sustainability programs, which means that there is a small amount of qualifying U.S. corn ethanol available to meet California's Sustainability Criteria. Note that this small subset is also used to meet several international low-carbon programs, leaving yet a smaller pool of ethanol to send to California. As a result, the majority of ethanol would remain unable to meet the Sustainability Criteria and, with a deficit-generating CI value, this requirement would drastically reduce the amount of ethanol available in California. This proposed provision appears to be in conflict with CARB's baseline assumption under the proposed LCFS Amendment that ethanol will continue to be used at a 10% level in California gasoline through 2046.²

¹ CARB, Second 15-Day Changes to the Proposed Low Carbon Fuel Standard Amendments, §95488.9(g)(5)-(7).

² CARB, LCFS Amendments Initial Statement of Reasons, "Appendix C-3, Summary and Response to Department of Finance Comments on the Standardized Regulatory Impact Assessment" (Dec. 19, 2023), at 1.

- 297.2 In addition, CARB's economic assumptions in drafting the proposed LCFS Amendment, as described in the Standardized Regulatory Impact Assessment ("SRIA"), anticipated that the costs of CARBOB producers would be passed along to consumers. CARB did not anticipate that this would occur with ethanol producers, reasoning that ethanol is a credit generator constituting 10% of each volume of gasoline.³ However, if the majority of ethanol now generates a CARBOB CI value under the Second Change, ethanol will be a deficit generator whose costs may be passed on to the consumer.
- 297.3 In addition, CARB's economic analysis assumed local tax revenue from ethanol sales, even noting that declining gasoline excise taxes would be partially offset by higher volumes of ethanol.⁴ However, by assigning a CARBOB Cl value to the majority of ethanol, it is far more likely that ethanol volumes into the state will significantly decline well before 2046 and the local tax revenues will not be offset as anticipated. CARB's economic analysis for the LCFS Amendment does not reflect the effects of the Second Change on ethanol in the state.

We 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 Michael Harrison

Attachments

³ CARB, LCFS Amendments Initial Statement of Reasons, "Appendix C-1, Standardized Regulatory Impact Assessment" (Sept. 9. 2023), at 57, 58.

⁴ CARB, LCFS Amendments Initial Statement of Reasons, "Appendix C-1, Standardized Regulatory Impact Assessment" (Sept. 9. 2023), at 63.

ABFC Comments on Proposed Low Carbon Fuel Standard Amendments



October 16, 2024

California Air Resources Board 1001 I Street Sacramento, CA 95814

RE: Proposed 15-Day Modifications to Proposed Regulation Order

Dear California Air Resources Board,

Advanced Biofuels Canada is the Canadian national trade association for advanced biofuels and renewable synthetic fuels. ABFC members produce a portfolio of liquid low-carbon fuels (including alternative jet fuels), sustainable feedstocks, and intermediary products. Our members operate over 10 billion gallons of low carbon fuel production capacity globally and are significant suppliers to renewable and low carbon fuel regulations in Canada, the US, and worldwide. Many of our members have operations in both the United States and Canada.

Regarding the Proposed Low Carbon Fuel Standard Amendments posted on October 1, 2024:

- ABFC suggests that CARB take a 'risk-based approach' that relies on quantitative analysis to determine whether feedstocks are subject to any type of credit creation limit included in § 95482 (i). This approach is similar to that used in considering ILUC in the Renewable Energy Directive of the European Union and is referred to in the Canadian Clean Fuel Regulations.¹ This approach keeps the LCFS as a 'science-based policy' that makes decisions based on evidence and objective data.
- Should specific limits be definitively included in the current rulemaking, ABFC suggests that credit generation limits (§ 95482(i)) and sustainability provisions (§ 95488.9(g)) be applied solely to agricultural feedstocks that do not have an approved petition of aggregate compliance under 40 CFR § 80.1457 (which is currently only non-US and Canadian agricultural lipid

¹ COMMISSION DELEGATED REGULATION (EU) 2019/807 of 13 March 2019 supplementing Directive (EU) 2018/2001 of the European Parliament and of the Council as regards the determination of high indirect land-use change-risk feedstock for which a significant expansion of the production area into land with high carbon stock is observed and the certification of low indirect land-use change-risk biofuels, bioliquids and biomass fuel. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R0807

ABFC Comments on Proposed Low Carbon Fuel Standard Amendments



feedstocks). We suggest that credit limits to be applied as follows: 50% in 2028 and 25% in 2031.

- ABFC positively acknowledges the proposed updated approach which would apply the limits as of January 1, 2028 to fuels with a submitted pathway certification application under CA-GREET
 3.0.
- ABFC recommends that the system of aggregate compliance included in the US Renewable Fuel
 Standard be utilized for affirming suitability of feedstocks used for low carbon fuel production.
 - Should specific location information be required via CARB's rulemaking, we recommend that the provisions of the Sustainability Requirements for Biomass outlined in 95488.9 (g) be modified in the following ways:
- 298.5 The requirements identified in § 95488.9 (g) (5) (A) regarding attestations be introduced no earlier than the 2028 data year. This enables the low carbon fuel sector additional time to adjust to the tectonic changes being proposed in the LCFS.
- The attestation approach described in 95488.9 (g) (5) (c) be updated to identify the means of confirming coverage and the maximum size of area covered per shapefile to be equivalent to and utilize the USDA Cropland Data Layer [CropScape] system).

Thank you for this opportunity to provide comments.

Yours truly,

Advanced Biofuels Canada

October 16, 2024

Via Email

Rajinder Sahota, Deputy Executive Officer, Climate Change & Research Edie Chang, Deputy Executive Officer, Planning, Freight & Toxics Matt Botill, Chief, Industrial Strategies Division California Air Resources Board 1001 I Street, Sacramento, CA 95814

Re: Low-Carbon Methanol as Opt-In Fuel for LCFS

Dear Ms. Sahota, Ms. Chang, and Mr. Botill:

On behalf of Centerline Logistics, I want to thank you for meeting last month with stakeholders to discuss low-carbon methanol as a potential marine fuel in the near term to promote reduction of greenhouse gas, air toxics, and criteria pollutant emissions at California ports and in the areas surrounding the ports. I understand that others are also communicating their separate support for action by CARB to promote opt-in of low-carbon methanol under the LCFS. We wanted to write to you separately to provide our individual endorsement of CARB moving forward with a rulemaking to create this optionality.

Centerline Logistics is U.S.-based provider of energy transportation services, delivering essential fuels for both domestic and international supply chains. We are the largest operator of tank barges and associated tugs in California. As discussed at the meeting, low-carbon methanol could be a near-term drop-in fuel option that reduces greenhouse gas emissions as well as other pollutants. It is important to have as many alternative fuel options available to come online as quickly as possible. There are numerous fuels that will have a role in decarbonizing the ports, but it is important to recognize that the need for liquid fuels will continue to exist, and that any alternatives that also improve near port air quality in the near term could be harnessed while longer term options are explored and developed.

299.1

While you heard from the full range of the supply chain stakeholders that would be needed to make marine methanol fuel a reality at the Ports of Los Angeles and Long Beach, Centerline Logistics is prepared to play its role in advancing this effort. Centerline is actively preparing our barges to be capable of providing methanol as a marine fuel.

We understand that the timeline of the current rulemaking may preclude including this option now, but we hope that CARB will take immediate steps to advance such a rulemaking. Such action will provide needed incentives for the investment needed to bring methanol in as a drop-in fuel. The ability to generate LCFS credits as an opt-in fuel would serve as the necessary incentives.

October 16, 2024 Page 2

299.1 cont. In sum, adding regulatory language to the LCFS that allows credit generation for lowcarbon Methanol in marine transport would be consistent with California's first-mover history in policies to accelerate decarbonization, fully align with the Board's environmental justice initiatives to improve air quality right away in and near the ports, support California's efforts and requirements to achieve increasingly stringent national ambient air quality standards for particulate matter and sulfur dioxide, support achieving the Scoping Plan's 85% 2045 greenhouse gas reduction target, and dramatically reduce diesel use in the ports.

> We hope that the Board can include in the November 8, 2024, adopting resolution language direction to staff to pursue in short-order methanol as an approved opt-in fuel for the LCFS program under Section 95482. We believe this could be a first step toward broader inclusion of e-fuels, including low-carbon methanol. For now, the benefits of low-carbon methanol in marine applications, on their own, more than justify a regulatory amendment. Direction from the Board would be helpful in ensuring that staff can devote resources to pursuing this type of amendment and would signal the Board's support for low-carbon methanol as a commercially viable renewable fuel.

> If you have any additional questions, please feel free to contact me at rsekhon@centerlinelogistics.com.

Sincerely,

allethon

Ravi Sekhon Director of Engineering &Sustainability Centerline Logistics



October 16, 2024

VIA ELECTRONIC FILING

Ms. Rajinder Sahota Deputy Executive Officer - Climate Change & Research California Air Resources Board 1001 | Street Sacramento, Ca 95814

Re: Neste Comments on Proposed Low Carbon Fuel Standard (LCFS) Regulation Published on October 1, 2024

Dear Ms. Sahota:

300.7

Neste appreciates the opportunity to provide these comments to the California Air Resources Board (CARB) regarding the draft LCFS regulation 15-day package published on October 1, 2024. These comments are in addition to the comments submitted by Neste for the 45-day regulatory package¹, the April 10, 2024 LCFS Workshop², the August 12, 2024 15-day package³ and the recirculated EIR⁴, and all of our recommendations should be considered as part of this LCFS rulemaking.

300.1 Neste appreciates the work that has been done on this rulemaking and remains in strong support of the LCFS program. The LCFS program has an outstanding record of success in reducing emissions from the

300.2 transportation sector in the state of California. The new proposed targets will ensure that the program

- 300.3 continues to achieve high levels of emission reductions. We urge the rule's adoption at the November 8,
- 300.4 2024 CARB Board hearing. In addition, Neste also supports the positive changes proposed to the Automatic Acceleration Mechanism (AAM).

300.5 For considerations for improvement, we raise a concern with the cost implications of the various proposals that affect renewable diesel (RD) and SAF. These cost implications may lead to avoidable higher costs for consumers and renewable fuel supply instabilities without delivering significant environmental improvements as compared to CARB's proposals in the 45-day regulatory package. Neste recommends that CARB reprioritize technology neutrality to ensure that California consumers receive renewable energy at the lowest cost possible. Focusing on the renewable energy needs of nearby jurisdictions is counterproductive because climate change is a global phenomenon and any GHG emissions reductions will result in global benefits.

Neste continues to recommend the following as part of the LCFS rulemaking to protect consumer fuel prices, to continue incentivizing investments in liquid renewable fuels, and to be more aligned with the 45-day package published in December 2023:

- Reject the proposal giving CARB the discretion to not accept new RD pathway applications and reaffirm CARB's policy of technology neutrality (95488(d));
 - Apply an immediate CI step-down of **12%** (and not the proposed 9%) in 2025 to adequately address the large credit bank and more quickly stabilize the credit prices;

¹ https://www.arb.ca.gov/lists/com-attach/6974-lcfs2024-B2IUN1YkACcLaARb.pdf

² https://ww2.arb.ca.gov/form/public-comments/submissions/11066

³ https://www.arb.ca.gov/lists/com-attach/7564-lcfs2024-AG4HZFUnACcGZQNc.pdf

⁴ https://www.arb.ca.gov/lists/com-attach/16-eiarecirc lcfs2024-WjRUN10vUnULaAlW.pdf

300.7 cont. • ICF has shown that a step down of 20.25% is needed⁵ and the credit market continues believe that more is possible;

- 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;
- ^{300.9} Do not add the additional changes to the sustainability requirements (95488.9(g)) proposed in the August 2024 15-day package without recognizing the associated GHG reductions. This will only lead to higher costs; and
- Eliminate the proposed 20% cap on soybean, sunflower and canola oil (95482(i)). Such a cap is likely to increase use of fossil diesel and jet fuel as stated by CARB at the April 10th workshop⁶, and lead to avoidable RD and SAF price increases.
- 300.11 Neste also recommends the above changes in light of the August 2024 Recirculated EIR, noting on page 51 and 52 that RD and biodiesel represent the largest source of NOx and PM emissions reductions from this rulemaking⁷. Proposals to disincentivize RD and BD could therefore have real consequences in terms of negatively impacting air quality. In fact, CARB recently stated that California met its GHG reduction goals "due largely to the increased use of renewable fuels"⁸. Why alter the course of the LCFS when it is clearly achieving the desired outcomes?

Below is a detailed discussion of the analysis presented in this October 2024 15-day package. Neste also supports the comments from the Low Carbon Fuels Coalition (LCFC) and ICF on this rulemaking. We appreciate your consideration.

300.8Neste Supports Moving the Automatic Acceleration Mechanism (AAM) Trigger Review to Quarterly; The
cont.cont.AAM Should Start in 2026 (95484)

Neste supports moving the AAM trigger review to a quarterly basis because it will bring more clarity to how the LCFS will respond to overperformance. Reviewing the AAM trigger on a quarterly basis will reduce speculation in the credit market by simply cutting the time between reviews of whether the AAM should be triggered. If, for example the trigger review deadline in May has just passed, but for some reason the credit bank starts increasing significantly during the second half of the year, (for example, a new large supplier opens up in the market), market participants would be left in the dark until May of the following year about whether or not the AAM will be triggered. Moving the review to a quarterly basis will allow market participants to know more quickly how the LCFS will respond to pressures in the credit market.

Neste continues to believe that the AAM should start in 2026 (using 2025 data) given how large the credit bank is today. Waiting until 2027 will delay possible emissions reductions and investments in new production.

300.6 Reject the Proposal to Give CARB Discretion to Stop Accepting New RD Pathway Applications (95488(d))

cont.

Neste continues to be concerned by CARB proposing to stop accepting new pathway applications for biomass-based diesel starting in 2031 if certain ZEV mandates are met in 2029 (95488(d)). Neste strongly objects to this arbitrary proposal. It will bring uncertainty to the RD market precisely when companies are evaluating further investments into SAF production. Given the interconnectivity between the economics of SAF and RD, we see this as possibly hurting SAF in the long-term.

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

⁶ https://ww2.arb.ca.gov/sites/default/files/2024-04/LCFS%20April%20Workshop%20Slides.pdf, slide 21

⁷ <u>https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/recirculated_draft_eia.pdf</u>

⁸ <u>https://ww2.arb.ca.gov/news/california-greenhouse-gas-emissions-decline-across-most-sectors</u>

300.9 cont.

The Newly Proposed Sustainability Requirements in 95488.9(g) Could Increase Costs

cont.

Neste continues to recommend that CARB provide additional economic incentives to compensate for the proposed sustainability requirements. These new requirements could potentially have a positive impact on sustainability standards of the industry but will also bring complexity and additional costs to the value chain. Farmers will need to comply with a set of requirements to certify at the farm-level with no clear way of offsetting these cost increases. We therefore recommend that CARB provide economic incentives in the form of recognizing the emissions reductions from the adoption of climate smart practices like no-till or use of cover crops. The economic incentives will support compliance with this new requirement, and better performers would be awarded even more value which will incentive further innovation.

Neste also believes that the new sustainability requirements are still not well defined, and we encourage CARB to provide more specific guidelines on how to certify the entire value chain. Hopefully this can be done soon given how quickly CARB is proposing to implement the new sustainability requirements. Until CARB is able to provide this clear guidance, Neste recommends that CARB not punish producers by treating renewable fuels as their fossil equivalents if they are not compliant with all sustainability requirements as proposed in section 95488.9(g)(4). The entire value chain should have the information needed to comply before CARB enacts such a severe penalty, therefore Neste recommends that section 95488.9(g)(4) not apply until 2031.

300.10 Reject the Proposed 20% Cap on Soybean, Sunflower and Canola oil (95482(i))

cont.

Neste continues to oppose the proposal to cap soybean oil and canola oil to 20% of production at the company level (95482(i)). We also oppose the addition of sunflower to the cap. It is unclear how the cap will apply, it will incentivize use of fossil fuels and could lead to cost increases for consumers while not achieving much environmental benefit. Compliance with this requirement will be virtually impossible to manage at the corporate level because major producers such as Neste do not always have control over where our products ultimately end up.

The proposed cap is also arbitrary and provides no exceptions for crops that have zero land use change risk. Neste believes there should be exemptions for feedstocks that meet the definition of Intermediate Crop, and such feedstocks should remain out of this cap. The EU's Annex IX definition for intermediate crops is: "Catch crops and cover crops that are grown in areas where due a to short vegetation period the production of food and feed crops is limited to one harvest and provided their use does not trigger demand for additional land, and provided the soil organic matter content is maintained, where used for the production of biofuel for the aviation sector". This cap could restrict the development of vegetable oil alternatives that have scalability and additionality potential, and California could become even more dependent on renewable energy technologies that are unproven and much more expensive.

300.12 The LCFS Should Treat All Hydrogen the Same; Even When Used as a Feedstock (95488.9(i))

Hydrogen is a key feedstock in the production of RD and SAF, and Neste has invested in the development of hydrogen using low-CI electricity at our Porvoo, Finland refinery⁹. We hope to perfect this technology and eventually use it at all our refineries, including our Martinez Renewables Joint Venture plant in Martinez, California. Being able to leverage book-and-claim is essential because low-CI electricity is not always available near production facilities to produce green hydrogen. Neste was under the impression that section 95499.9(i)(1)(C) allowed for green hydrogen produced from low-CI electricity to leverage book-and-claim to produce lower CI RD and SAF. However, page 6 of the "Tier 1 CI Calculator for HEFA Fuels

⁹ <u>https://www.neste.com/en-us/news/neste-has-been-granted-energy-investment-aid-for-its-green-hydrogen-project-at-the-porvoo-refinery</u>

300.12 Instruction Manual" states that book-and-claim of low-CI electricity is not allowed in this case¹⁰. Neste is disappointed that CARB is treating hydrogen used as a fuel differently than hydrogen used as a feedstock, when they are both ultimately used as fuels. Neste requests that CARB not styme innovation and allow RD/SAF producers to use book-and-claim for the generation of green hydrogen. Efforts to produce green hydrogen for RD/SAF could bolster overall innovation around the production and use of green hydrogen.

Thank you for considering our comments. We look forward to continuing to work with CARB on this rulemaking and urge its adoption at the scheduled November 8, 2024 meeting

Oscar A

Oscar Garcia Sr. Regulatory Affairs Manager Neste US, Inc.

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https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/instr.manual_tier1_ci_calc_hydroprocessed_e ster_%26_fatttyacid_fuels.pdf

October 16, 2024

Submitted via ca.gov

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

Re: Comments on Second 15-Day Changes to Proposed Low Carbon Fuel Standard Amendments

Dear Chair Randolph:

Leadership Counsel for Justice & Accountability, Central Valley Defenders of Clean Water & Air, Animal Legal Defense Fund, and Food & Water Watch (collectively, "Commenters") submit the following comments on the Second 15-Day Changes to the Proposed Low Carbon Fuel Standard Amendments ("Second 15-Day Changes").¹ Adoption of the proposed Amendments would be arbitrary, capricious, contrary to law, and beyond CARB's statutory authority as explained by Commenters numerous times throughout this rulemaking process. These Second 15-Day Changes do nothing to remediate those legal infirmities.

Additionally, the Second 15-day changes demonstrate CARB staff's priority of guaranteeing profits for megadairies and factory farm gas investors over addressing the perverse harms to Californians and CARB's own climate change mitigation efforts. In at least two board meetings on the LCFS, several board members called for reducing the number of years available for avoided methane crediting and replacing the voluntary incentive scheme with a regulatory approach. Yet, proposals released following each of those meetings actually *increased* avoided methane crediting beyond the proposed parameters that board members had critiqued. In clear conflict with board direction, these Second 15-day changes reinforce a harmful preference for subsidies over equitable and effective regulations.

Also concerning to Commenters is that, since the Standardized Regulatory Impact Assessment² (SRIA) was released in September of 2023 and disclosed the significant pass-through costs that will be borne by Californians through higher gasoline and discel prices,

¹ CARB, Second Notice of Public Availability of Modified Text and Availability of Additional Documents and/or Information Proposed Low Carbon Fuel Standard Amendments (Oct. 1, 2024) <u>https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/2nd_15day_notice.pdf;</u> <u>https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/2nd_15day_atta-1.pdf</u>

301.1

² CARB, Low Carbon Fuel Standard 2023 Amendments Standardized Regulatory Impact Assessment (SRIA) (Sept. 8, 2023), <u>https://ww2.arb.ca.gov/sites/default/files/2023-09/lcfs_sria_2023_0.pdf</u>

301.1 cont. CARB staff have aggressively attempted to downplay what most know to be true. The oil and gas industry will benefit from purchasing avoided methane credits from factory farms because that will allow them to offset their high-CI fossil fuels, will continue to produce those fuels, and then will increase prices at the pump to pass cost of the credits onto the public. CARB staff thus demonstrate clear indifference towards the communities that will most significantly bear the pollution costs and fuel costs of the LCFS.

1. <u>When CARB Board Members Recommend *Reducing* the Longevity and Perversity of Credit Generation from Livestock Methane, CARB Staff Responds by *Amplifying* the Problem</u>

At CARB's September 2023 board meeting, the Board responded to the policy direction outlined in the Standardized Regulatory Impact Assessment (SRIA) for the LCFS rule change. The SRIA prepared by CARB staff anticipated eligibility for avoided methane crediting for livestock and landfill gas through 2039. Several board members responded to that proposal with concerns that allowing avoided methane crediting through 2039 was too long and set the signal for phase out of these uniquely lucrative subsidies for livestock gas too far into the future. In response to several board members' call to consider reducing the timeframe for avoided methane crediting, CARB staff's proposed LCFS rule,³ released in December of 2023 and updated in January of 2024, expanded eligibility for avoided methane crediting as compared to the proposal in the SRIA to three ten-year crediting periods, or through 2059 for some LCFS pathway holders. This is twenty years longer than the timeline envisioned in the SRIA.

The first set of 15-Day Changes,⁴ released in August of 2024, modified the time period for avoided methane crediting to two ten-year crediting periods (or through 2049) - still far too generous according to several board members who recommended a shorter timeline for avoided methane crediting - such as one ten-year crediting period - during the September 24th joint CARB / EJAC meeting.⁵ The Second 15-Day Changes, released after the joint CARB / EJAC meeting, responded by backsliding on the modifications CARB staff had proposed just a month earlier and extended the avoided methane crediting period out again to three 10-year crediting periods for projects that have been certified prior to the effective date of the LCFS rule change.⁶ In short, members of the public and several CARB members have called on CARB staff to more

⁴ CARB, Notice of Public Availability of Modified Text and Availability of Additional Documents and/or Information Proposed Low Carbon Fuel Standard Amendments (Aug. 12, 2024),

https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/15day_notice.pdf ⁵ See also Aaron Smith, How Much Should Dairy Farms Get Paid for Trapping Methane?, Ag Data News (Oct. 14, 2024).

³ CARB, Proposed Regulation Order Proposed Amendments to the Low Carbon Fuel Standard Regulation (Jan. 2, 2024), <u>https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/lcfs_appa1.pdf</u>

https://agdatanews.substack.com/p/how-much-should-dairy-farms-get-paid ("[A]fter the initial 10 year crediting period, there is little economic justification to continue these credits.") (included here as Exhibit 1).

⁶ CARB, Proposed Amendments to the Low Carbon Fuel Standard Regulation at § 95488.9(f)(3)(A) <u>https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/2nd_15day_atta-1.pdf</u>

aggressively phase out avoided methane crediting in the LCFS, and CARB staff have responded by doing the opposite.

301.2

2. <u>Staff Proposes to Fundamentally Change the Possible Scope and Applicability of Livestock Methane Regulations</u>

A fundamental change in these Second 15-Day Changes is an insidious rejection of the board's direction to shift to a regulatory approach for livestock methane. After the Board gave direction to staff to draft a resolution to initiate rulemaking for livestock methane, staff added one clause into the proposed LCFS amendments that would effectively exempt for decades many of the biggest climate polluters in the livestock industry from whatever regulatory requirements CARB may adopt. The addition of "for pathways associated with projects that break ground after December 31, 2029" to section 95488.9 of the regulations⁷ would exclude livestock operations with digester projects that break ground before 2030 from the existing rule⁸ that avoided methane crediting is only available for the remainder of a pathway holder's 10-year crediting period if CARB adopts regulations mandating reductions of livestock methane. In other words, CARB staff propose to lock in a bogus baseline for megadairies that is incompatible with its obligations under AB 32 and SB 1383 and is designed to sidestep board direction.

This wrongheaded amendment would:

- Create a regulatory framework that creates two classes of livestock operations and effectively suspends the regulatory impact on dairies with digesters for 20 years or more;
- Lock in perverse incentives and windfall profits for the production of methane and concentration of cattle, manure, methane, and other pollution;
- Exclude methane emissions reductions that are accounted for through LCFS credits from counting toward the state's SB 1383 methane reduction requirement; and
- Unlawfully exempt livestock methane emissions reductions from additionality requirements.

a. <u>CARB Staff Intends to Create Two Classes Of Livestock Operations that Will Exist</u> <u>Under Two Opposing Regulatory Frameworks</u>

The proposed regulatory framework will create two classes of livestock operations and will treat those two classes completely differently. One class could be subject to regulation and would need to modify its operations to actually *reduce* methane generation, and the other will be able to profit from at least two decades of lavish subsidies for the *production* of methane and its

⁷ *Id.* § 95488.9(f)(3)(B).

⁸ Cal. Code Regs. Tit. 17, § 95488.9(f)(3)(B).
301.2 cont. conversion into a combustion fuel and offset mechanism that benefits the oil and gas industry. Put differently, one class of dairies will be subject to baseline assumptions that require reduction of methane emissions, the other - those with digesters in place by 2030 - will be rewarded with a baseline assumption of freely vented methane from massive manure lagoons. This places the entire burden of compliance with SB 1383 on disproportionately smaller and less polluting operations that do not have digesters or LCFS pathways. Perversely, this would further reward the biggest polluters that have been able to tap into the LCFS money spigot for factory farm gas the very polluters that necessitated SB 1383 in the first place because of megadairies' large share of the state's overall methane emissions.

This represents a sea change in SB 1383's framework and CARB's own policies toward livestock methane which called for an end to avoided methane crediting upon adoption of relevant regulations. This proposal, if adopted, would also severely hamper CARB's ability to create an effective, fair, and equitable livestock methane rule that provides an opportunity for different types and different sizes of livestock operations to thrive. It also distracts from cheaper, more effective means to reduce dairy manure methane emissions at the largest polluters in the sector. This would be arbitrary and contrary to CARB's legal obligations.

b. <u>CARB Staff Signals to Livestock Operators and Factory Farm Gas Producers that</u> <u>They Need to Act Fast to Install Digesters and Generate Methane</u>

This amendment would lock in perverse incentives and windfall profits for the production of livestock biogas that necessarily favor the concentration of cattle, manure, and pollution. This rule change will even further incentivize livestock operations to install digesters and maximize biomethane production as quickly as possible given the vastly different treatment livestock operations with digesters installed prior to January 1, 2030 and those after January 1, 2030 would receive under a bifurcated regulatory framework. As discussed in previous comments, this would have harmful and potentially irrevocable impacts on the groundwater, drinking water, air quality, and quality of life for people living in the San Joaquin Valley.

c. <u>The Second 15-Day Changes Would Exclude Methane Emissions Reductions from</u> <u>Counting Toward Dairy Sector Methane Reduction Mandates for Decades to Come</u>

Additionally, as Commenters have explained numerous times, any emissions reduction allowed to generate LCFS credits through avoided methane crediting acts as an offset for the oil and gas sector. In other words, every metric ton of CO2eq captured at a factory farm operation that is transformed into an LCFS credit and purchased by a deficit generator in the transportation sector *locks in* those emissions with respect to the livestock sector. The greenhouse gasses are generated by the livestock sector, and making the capture of those emissions a transferable attribute has the unavoidable result of immutably assigning those emissions to the livestock

301.3

^{301.3} cont. sector once that transfer occurs. CARB staff either do not understand or wish to arbitrarily ignore the basic rules of environmental attribute trading.

This significantly undermines the integrity of CARB's climate change policies and threatens to put SB 1383 compliance out of reach. When oil and gas companies use those LCFS credits to meet the Carbon Intensity obligation for the transportation sector, those same emissions cannot simultaneously be said to achieve compliance in the agricultural sector. The latest 15-day changes effectively takes any alleged emissions reductions accounted for through LCFS avoided methane credits off the table for 20-30 years for the purposes of compliance with SB 1383. This makes a mockery of regulatory integrity as CARB staff seek to use the exact same methane reductions to satisfy separate regulatory programs and requirements - simply put, this is brazen double counting that exceeds CARB's statutory authority and is arbitrary and capricious.

301.4

d. <u>The Proposed Rule Change in the 15-Day Changes Unlawfully Exempts Livestock</u> <u>Methane Emissions Reductions From Additionality Requirements</u>

CARB staff's proposal in the 15-day changes to allow ongoing credit generation despite adoption of a regulation mandating the very same emissions reductions, explicitly excludes livestock methane emissions reductions from any standard of additionality, a cornerstone of California's climate programs. As Commenters have already detailed in earlier comments with respect to additionality, Health & Safety Code § 38562(d)(2) requires additionality for the LCFS as a market based compliance mechanism. Furthermore, SB 1383 only allows an extension to the extent authorized by Division 25.5, which includes section 38562. *See* Health & Safety Code § 39730.7(e). CARB thus has no authority to allow for non-additional credit generation after implementation of regulations adopted pursuant to SB 1383.

301.5

3. <u>The Proposed Change to the Dairy and Swine Manure Biomethane Calculator Instruction</u> <u>Manual Acknowledges that Livestock Herd Expansions Are Welcomed by CARB Staff</u>

CARB staff propose to alter text in the Instruction Manual for the Tier 1 Simplified Calculator for Biomethane from Anaerobic Digestion of Dairy and Swine Manure to more expressly allow herd expansions.⁹ Staff propose to change the instruction that factory farm gas projects "must not exceed the herd size limit set by any applicable local or state regulatory or other legal requirements" to "must *be in compliance with any* herd size limit...." This change accommodates the many jurisdictions that do not limit factory farm herd sizes and those that expressly countenance herd expansions when done in conjunction with digester developments.¹⁰

¹⁰ For example, Iowa expressly allows for herd expansion above state standards if a factory farm plans to use a manure digester. Eric Jordan, *Nine Iowa Dairies Get Digester Permits Since New Law, Seven Plan Expansion*, Gazette (Dec. 3, 2021),

⁹ https://ww2.arb.ca.gov/resources/documents/lcfs-life-cycle-analysis-public-comment.

https://www.thegazette.com/agriculture/nine-iowa-dairies-get-digester-permits-since-new-law-seven-plan-expansion

- 301.5 cont. This technical change illustrates that CARB staff know and accept that herd expansions are allowed and a likely response to staff's proposed LCFS amendments at factory farms generating the manure used to produce LCFS credits.
 - 4. <u>Conclusion</u>

301.6 These latest amendments claim to be in response to public comment. But whose public comments? Not the comments of those living near dairies who have shared evidence of how the LCFS's treatment of livestock methane is harming their quality of life, their neighborhoods, and their health. Not the comments of advocates who have demonstrated that lavish subsidies for livestock methane undermine both environmental justice and meaningful climate change policies. Not board members who have said we need livestock methane regulation now, and we need to phase out subsidies for livestock biogas as soon as possible. It is apparent that these changes are responsive to those that benefit financially from the factory farm gas windfall, and no one else.

The LCFS amendments, as currently proposed, will not effectively address livestock methane, will fall short of helping us reach our clean transportation goals, and amount to a complete rejection of environmental justice. And, adding insult to injury, many of the same Californians that will bear the brunt of the environmental injustice embedded in CARB's broken policies toward livestock methane emissions, will also bear the brunt of the economic costs by paying more at the pump. This proposal doesn't just fall short of what the Board has called for, but perverts its direction with an LCFS that will go from bad to worse.

The Board must reject this harmful approach and instead demand amendments that are responsive to its direction and the needs of California residents deeply invested in California's climate policies, not with their investment portfolio, but with their very lives.

Sincerely,

Jamie Katz Phoebe Seaton Leadership Counsel for Justice & Accountability Central Valley Defenders of Clean Water & Air

^{2.} And one of the largest dairies in the U.S. that also has an approved LCFS pathway operates under a permit that allows a 10% herd expansion by default (this equates to an increase of 2,800 head). Notice of Registration and Oregon Confined Animal Feeding Operation (CAFO) National Pollutant Discharge Elimination System (NPDES) General Permit Summary: Threemile Canyon Farms, LLC (included here as Exhibit 2). These mechanisms for expanding herd sizes are common and underscore CARB's inability to control for operators that perversely increase their emissions to capitalize on the LCFS credit market.

Brent Newell Law Office of Brent J. Newell

Tyler Lobdell Food & Water Watch

Christine Ball-Blakely Animal Legal Defense Fund

Exhibit 1

How Much Should Dairy Farms Get Paid for Trapping Methane?

The answer hinges on four important numbers.



AARON SMITH OCT 14, 2024





An anaerobic digester. Source: CARB life cycle analysis for an LCFS project

One way to reduce pollution is to trap pollutants before they escape into the atmosphere. Examples include <u>scrubbers in power plant smokestacks</u> (NOx), <u>catalytic</u> <u>converters in cars</u> (CO, NOx, hydrocarbons), and <u>anaerobic digesters</u> on dairy farms

Share

(methane). The burning question surrounding these technologies is who pays for them and how much. This question is important because budgets are limited. Overpaying for mitigation in one setting means less money available for other things we value.

California has decided that gasoline and diesel buyers should pay for <u>anaerobic digesters</u> to trap methane from decomposing dairy cow manure, which is responsible for <u>25% of</u> <u>the methane</u> produced in the state. California's low carbon fuel standard (LCFS) allows farmers to earn credits from capturing methane, a potent greenhouse gas. Gasoline and diesel producers buy these credits to satisfy their obligations under the LCFS and<u>pass</u> <u>the cost of these credits</u> along to consumers. I<u>summarized the role of digesters in the LCFS in January</u>.



The state's air resources board (CARB) is <u>currently considering changes</u> to the LCFS, including the timeline for phasing out these credits for dairy farms. Here, I assess CARB's options by comparing four numbers: (i) the cost of building a digester, (ii) the cost of operating a digester, (iii) the benefit to society of reducing methane emissions, and (iv) the value of credits from state and federal policies.

How much do digesters cost?

<u>Anaerobic digesters</u> are essentially giant covers that seal manure in a lagoon to keep oxygen out while microbes feed on the contents. According to data provided to CARB, it cost \$8.6m to construct a typical digester in 2023 on a dairy with 2,500 milking cows. This equates to \$1.2m per year if amortized over 10 years.

To participate in the LCFS, the digester operator cleans the trapped gas and injects it into a pipeline for use in transportation. For an average digester project, it costs \$1.1m per year to operate the digester, and the operator can sell the gas for approximately \$230,000 at <u>2023 city gate natural gas prices</u>, so the net operating cost is \$870,000. If the project cannot connect to a pipeline and needs to truck the gas to an existing utility pipeline tap, then it would incur an extra \$500,000 in cost. It will be helpful to express these costs in dollars per ton of abated methane so we can compare them to benefits. Luckily, CARB computes an estimate of tons abated for every project in the LCFS.

This representative digester is estimated to prevent 760 metric tons of methane emissions per year (calculation details at end of article). So, amortizing over 10 years, the annual capital cost works out to \$1580 per ton abated per year. The net operating cost after subtracting revenue from selling the gas is between \$1150 and \$1800 depending on whether the operator has to pay trucking costs.

What is the social value of preventing methane emissions?

According to the <u>EPA</u>, a ton of methane emitted in 2023 imposes costs of \$2200 on society. This number is measured in 2023 dollars and is based on a 2% discount rate (calculation details at end of article).

How Large are the Subsidies to Digesters?

When they sell the biogas trapped by a digester, dairy farms earn credits under both the LCFS and the federal Renewable Fuel Standard (RFS). Credit prices in the RFS are higher this year than last. At the current price of \$3.20 per credit under the RFS, digester operators would receive \$2200 per ton of methane abated.

LCFS credits for dairy biogas have two components:(i) a payment for the methane that would have been emitted from decaying manure had the digester not been present, and (ii) a payment for the fact that combustion and production of biogas emits less CO2 than the specified standard. At the going price of \$55 per credit, an average digester would earn \$1340 per ton of methane abated, of which \$1240 stems from preventing methane emissions and \$100 from the fact that biogas burns cleaner than the LCFS standard.

California digester projects can get<u>grants from the state</u> to cover up to half of capital costs. I do not include these grants here, in part because two-thirds of biogas generated by livestock digesters comes from out of state. Yes, out of state producers are eligible to participate in the LCFS.

We now have all four numbers, summarized in the figure below.



Four Important Numbers for Anaerobic Digesters

Net operating cost is operating cost minus city gate value of natural gas produced LCFS credit price = \$55; D3 RIN price = \$3.20

Are digesters cost effective?

Digesters can last for decades. Over the first 10 years, the net cost of constructing and operating a digester is between \$2730 and \$3380 per ton of methane abated. This amount exceeds the estimated social value of the avoided methane emissions, which is \$2200.

Importantly, the <u>social cost of methane number I use</u> is based on a time horizon extending to 2300. Methane causes most of its damage in the first 20 years, after which its effects dissipate dramatically. Therefore methane emissions are vastly more damaging than CO2 if evaluated over a 20 year horizon, but relatively less damaging if evaluated over a longer horizon. If damages are evaluated only over the next 20 years, then a ton of methane is 80 times worse than a ton of CO2. Evaluated over 100 years, it is 25 times worse, and over 300 years it is about 10 times worse.

CARB uses a 100 year horizon, which means that it quantifies the damage caused by a ton of methane as equal to 25 times the damage caused by a ton of carbon dioxide. I think EPA makes a strong case to use a longer horizon. However, using the CARB approach would raise the estimated social value of the avoided methane emissions by a factor of 2.5.

At current credit prices, digesters receive \$3540 per ton of methane abated. This amount substantially exceeds the estimated social value of the avoided methane emissions. However, it is quite similar to the upper bound cost of building and operating a digester. If we have decided that anaerobic digesters are the way we are going to prevent manure methane emissions, then the federal and state credits combined are just enough to make that work over the first 10 years of a digester's life.

Capital costs vs operating costs

CARB policy discussions center around the length of time a digester can claim credits for avoided methane. Current policy allows crediting for methane prevented in the first 10 years a digester operates, but it allows renewal for up to two additional 10 year periods. CARB's modest_proposal is that projects breaking ground before January 1, 2030 will be limited to two consecutive 10-year crediting periods and those breaking ground later would be further limited.

After the first 10 years, once capital costs have been paid, there is little economic justification for digesters to receive prevented methane LCFS credits. At current prices, credits from the RFS, plus the component of the LCFS credit stemming from fuel combustion, are more than sufficient to cover costs. This statement is particularly pertinent for the two thirds of digester credits generated outside the state. The federal program is providing enough to keep these digesters running; California drivers are effectively donating additional dollars.

If credit prices were to revert to their 2021 values (much higher LCFS credit prices and somewhat lower RIN credit prices), then the figure below shows that prevented methane credits would provide a substantial windfall to existing digesters.

There are caveats. If the cost numbers I am using are too low, then existing digesters may shut down if prevented-methane crediting were to disappear. If biogas were to stop earning credits in the RFS, then the same would be true.



What if credit prices go back to 2021 levels?

Net operating cost is operating cost minus city gate value of natural gas produced LCFS credit price = \$200; D3 RIN price = \$2

Conclusion

Prevented methane emissions credits cover the cost of constructing a digester. However, after the initial 10 year crediting period, there is little economic justification to continue these credits.

Most fuels in the LCFS are evaluated based on the emissions generated during their production and combustion. Credits for prevented methane emissions make digesters on livestock operations unique. Digesters on landfills do not receive such credit. We should be asking why the state, through its LCFS and other programs, should value the same pollutant so much more based upon its source. It undercuts the goal of the LCFS to be technology neutral.

My analysis takes as given that the state has decided to use digesters in the LCFS to reduce livestock manure methane emissions. I did not consider other potential methane-reduction technologies, such as worms, flies, or drying and spreading. I also did not consider other policy levers such as subsidies funded by taxpayers or pricing methane emissions directly, some of which I addressed in <u>my prior article</u>. A drawback of subsidizing green technologies is that it may cut off potentially less expensive options. There's also the weirdness of running agricultural emissions policy through a transportation program.

This article is cross-posted on the **<u>EI Blog</u>**.

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Addendum: Details on calculations

How I got 760 metric tons of prevented methane emissions

I started with this project's LCFS carbon intensity of -355 grams of CO2-equivalent per megajoule of energy delivered. This value stems from approximately 45g of emissions from burning the biogas to power a CNG vehicle and 400g of prevented emissions (45-400=-355). CARB equates a gram of methane to 25 grams of CO2, so our digester is preventing 400/25 = 16g of emissions per megajoule. The digester produces 45,000 MMBTU per year, which is 47.5 million MJ, so it is preventing 47.6*16 = 760 metric tons of methane emissions per year.

How I got a social cost of \$2200 per ton

EPA estimates damages of \$1600 in 2020 and \$2400 in 2030. For simplicity, I interpolated linearly to get damages of \$1840 in 2023. Then, to convert from 2020 dollars to 2023 dollars, I added 20% inflation to get \$2200.

How big are the subsidies?

LCFS credits are based on the difference between the carbon intensity standard (87.01 in 2024) and the carbon intensity of the digester (-355 in our example). So, the LCFS credit value is (45000/760)*(CI+355)*0.9*1055*(LCFS credit price)/1000000 per ton of methane abated.

RFS credits are based on the volume of the fuel rather than its estimated life cycle carbon emissions. Dairy biogas generates 11.727 RIN credits per MMBtu, so the RIN value is (45000/760)*11.727*(RIN credit price) per ton of methane abated.



Discussion about this post

Comments

Restacks

Write a comment...

argonbeam Oct 14

I appreciate you mentioning California residents (not just active drivers, as I assume the majority of added transportation cost resulting from increased fuel costs are passed on to end consumers as well) are subsidizing out of state digesters via LCFS. When I explain this to other Californians, none are happy to learn this. You may have seen a recent Tier 2 biodiesel pathway that claimed avoided methane emissions in their final CI score by utilizing food waste feedstock that they document would be landfilled otherwise. They had negative-CI BD as a result. I argued against this via public comment, as did ICCT. To no avail. So I expect additional creative methane emission avoidance applications for non-methane fuels going forward.

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Exhibit 2

Notice of Registration and Oregon Confined Animal Feeding Operation (CAFO) National Pollutant Discharge Elimination System (NPDES) General Permit No. 1 Summary

Overview of **CAFO General** Permit Summary The Oregon CAFO General Permit No. 1 became effective on August 15, 2003, and was issued by the Oregon Department of Agriculture (ODA) and Department of Environmental Quality (DEQ) on October 1, 2003. General Permit No. 1 expired on July 31, 2008, and a renewal notice and application request was signed by Threemile Canyon Farms on July 10, 2008. This Notice of Registration describes your specific permit registration information and an overview of permit requirements.

Your dairy CAFO was registered to CAFO General Permit No. 1 on May 31, 2005, and updated (animal increase) on May 31, 2013, based on information provided by you as follows:

	Mas	ter Address No.AG-P0179665CAFG	EPA Registration No. ORG 010556	
		Operator	Legal owner, if different	
	Name	MARTY MYERS, GEN. MGR.	THREEMILE CANYON FARMS, LLC	
	Business Name	THREEMILE CANYON FARMS,	SAME	
		LLC /COLUMBIA RIVER		
		DAIRY, LLC		
	Mailing Address	75906 THREEMILE RD		
		BOARDMAN, OR 97818		
	Facility Address	75906 THREEMILE RD		
		BOARDMAN, OR 97818		
	Main Phone	541/481/9274		
	To mail Address			
	E-mail Address	man(d)threemnecanyontarms.com		
	Maximum	The maximum number of animals that may be held at this Dairy CAFO is 28,000 based on		
	Number of	the following population: 28,000 mil	king and dry cows. You may not exceed this number	
	Animais	by more than 10% or 25 animals, whichever is greater, without first providing ODA with a revised Animal Waste Management Plan (AWMP) and receiving written ODA approval. Based on the type and size of your operation, ODA has determined that you operate a Large Concentrated CAFO. Note: Large Concentrated CAFOs have additional requirements.		
	Facility			
	Classification			
		Please see general permit.	•	
4	Rach Gasel was as		Morrow County	
Annual Permit	this general permit	u will be assessed an annual compliance	te ree of \$300.00 to maintain your registration under	
1.00	dilla generat permit.			
For Ouestions/	If you have questions, call your regional livestock water quality specialist for Area V at (541) 617-0055 or the			
Additional	Salem office at (503) 986-4699. Additional CAFO program information is available on the internet at			
Information	http://oregon.gov/ODA/NRD/cafo_front.shtml			
	The energies must b	a in compliance with all terms and com	ditions of the normit (not only this summary of the	
Conditions	permit) at all times.			
			· · ·	
Prohibited	The following types	s of discharges are prohibited:		

P. 1 of 2.

Discharges

Overflow or discharges from waste storage facilities;

Discharges due to improper land application activities from surface drainages or field tile outlets; •

- Discharges due to equipment failure; and
- Leakage or seepage from facilities in the production area in excess of approved designs. .

When Discharge	Production Area: Discharges of process waste water to surface waters of the state are generally proh		
is Allowed	exc		
	٠	When rainfall events cause an overflow of process waste water from a facility designed, constructed,	
		operated, and maintained to contain all process-generated waste waters plus the runoff and direct	
		proginitation from a 25-year 24-hour rainfall event provided there discharges do not cause or contribut	

Contaminated runoff from confinement or waste accumulation areas;

precipitation from a 25-year, 24-hour rainfall event provided these discharges do not cause or contribute to a violation of state water quality standards; or

In the event of an upset or bypass condition. These conditions are further defined in the permit.

	All authorized discharges from the production area must be properly land applied or otherwise handled in a way that minimizes impacts on surface water and groundwater sources.
	<i>Land Application Area:</i> Storm water runoff from the land application area is not considered a prohibited discharge and is allowed if the land is being managed in compliance with the AWMP approved by ODA.
Animal Waste Management Plan (AWMP) Requirement	The permit requires that each permitted operation have a current AWMP approved by ODA. An AWMP describes how a CAFO is managed with respect to containment, treatment, storage, and utilization of manure, litter, and process wastewater in order to remain in compliance with permit conditions and water quality laws. The AWMP must accurately represent current land base, manure storage, herd/flock size, and current management practices used at the livestock operation. The AWMP must reflect production practices and be implemented accordingly.
Storage Requirement	You must provide adequate storage capacity for solid and liquid wastes at all times so that land application occurs only during periods when soil and weather conditions are suitable.
Monitoring, Recordkeeping & Reporting	Monitoring, recordkeeping and reporting of waste applications, and inspection requirements must occur as described in an AWMP approved by ODA and requirements in section S4. of the permit. <i>Note: Large concentrated CAFOs have additional requirements</i> .
Land Application Rates & Timing Permit sections	You must apply manure, litter and process wastes to lands at agronomic rates in accordance with proper agricultural practices and as specified in a waste management plan that has been approved by ODA. Waste applications must not exceed the capacity of the soil and crops to assimilate nutrients and minimize water pollution, must be quantifiable, and based on the NRCS Phosphorous Index, Agronomy Technical Note #26, revised June 2008, and must account for all other nitrogen and phosphorus.
	Prohibitions: If discharge to surface water or groundwater will result, application to flooded and saturated land is prohibited. Proposed waste and waste water application to frozen soil must be included in an AWMP. Land application of wastes or waste water during rainfall events that are expected to result in saturated soils or surface runoff is prohibited.
Duty to Report Noncompliance	If at any time you are unable to comply with any permit conditions, you have a duty to contact ODA immediately so the situation can be assessed and remedial actions taken if necessary. Note: If you have a discharge to surface water or groundwater that is not allowed by the permit, you must notify ODA within 24 hours of the discharge. Please call your area livestock water quality specialist at (541) 617-0055 or CAFO Program support in Salem at (503) 986-4699.
Annual Report Permit section S4.D.2, p. 18.	You must submit an annual report to ODA by March 15th of each year.
Construction of Waste Storage and Waste Water Control Facilities	S2.E. 2 of the permit states that you "must site, design, construct, operate, and maintain all waste storage facilities consistent with the AWMP. New and modified construction of waste facilities must be approved in advance and prior to construction by ODA in conformance with ORS 468B.055 and OARs 340-051 and 603-074." Experimental or unproven technologies must receive prior approval from ODA. For all other modifications or new construction, no approval will be required. Certification forms are available from ODA.
Public Noticing & Participation Permit section S1.H, pp. 7 & 8.	Prior to approving new permit coverage, renewing permit coverage, or approving proposed substantial changes to an AWMP, ODA will provide public notice and participation.
Wyn Ace	also a

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Ray Jaindl, Director Natural Resources and Pesticides P. 2 of 2.



October 16, 2024

Matthew Botill California Air Resources Board 1001 I Street Sacramento, CA 95814 Via Online Submission: https://ww2.arb.ca.gov/applications/public-comments

Comments on Proposed Low Carbon Fuel Standard Amendments—Second 15-Day Changes

Dear Mr. Botill:

302.1

Thank you for the opportunity to provide comments in response to the Low Carbon Fuel Standard (LCFS) proposed modifications (Second 15-Day Changes). We appreciate CARB 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 the Second 15-Day Changes proposal.

SkyNRG has been engaged in enabling sustainable aviation fuel (SAF) as a solution to decarbonize aviation since 2010. 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 (or electrify) 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 2030.¹ 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

¹ <u>Governor Newsom Calls for Bold Actions to Move Faster Toward Climate Goals | Governor of California calling for</u> 20% SAF target.



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.

SkyNRG submits the following comments related to avoided methane crediting periods and the deliverability trigger for RNG, the addition of sunflower oil to the list of capped virgin crop-based feedstocks, support for increased program ambition for 2025 and beyond, flexibility around mass balance accounting and increased ambition in support of SAF as a solution.

Some Changes to RNG Treatment and Credit Generation Are Problematic; Further Study is Necessary

302.2

Crediting Periods Allowed for Avoided Methane Needs More Clarification

SkyNRG is disappointed that CARB plans to reduce the total number of crediting periods for avoided methane emissions for RNG projects built after January 1, 2030, from three to two. This is a very problematic change as both agricultural and organic waste diversion projects are heavily dependent on the LCFS for viability.

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 that limit opportunities to include avoided emissions in CI calculations. Recognition for this GHG benefit should not simply be ignored particularly when no replacement policy is in place. As noted in previous comments, is unwise and risky to impose an arbitrary phase-out of avoided methane crediting without a detailed plan for developing a supporting replacement policy.

If there are to be limits on credits from the use of avoided methane, the longest possible phase-out period is preferred. The treatment of avoided methane continues to create significant project uncertainty and increases the potential for stranded assets—an issue correctly cited by CARB during prior workshops as a key outcome to be avoided.²

302.3 If CARB truly wants methane abatement from sources such as agricultural wastes to continue, and for new sources of RNG activity such as organic waste diversion from the municipal waste stream to develop, they must reconvince the clean fuel investment community that RNG will remain a viable and important contributor to the LCFS framework. 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.

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.

² See CARB's Presentation at the February 22, 2023, LCFS Workshop, slide 31. <u>https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/lcfs meetings/LCFSpresentation 02222023.pdf</u>



302.3 cont. The GHG emission reductions resulting from CNG fleets being the default for many medium- and heavyduty 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.

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 the Governor's recently stated goal for SAF by 2030.

302.4

Deliverability trigger creates a barrier to imports and should not be adopted in the LCFS

The Second 15-Day Package's changes to deliverability requirements are still problematic for RNG development. The new proposal is to trigger the timing of deliverability requirements for RNG to natural gas vehicle pathways based on medium- and heavy-duty zero-emission (ZEV) and near-zero-emission (NZEV) vehicle penetration.

While we understand conceptually that CARB may not want RNG to be used in natural gas vehicles if ZEV penetration goals succeed, the trigger itself is not something that RNG developers are comfortable predicting. Because LCFS crediting requires having an established end use for the RNG (to receive pathway approval and to understand eligibility for federal Renewable Fuel Standard credits), investment in methane reduction cannot be made with much certainty based on this trigger.

Given that California clearly benefits from broad North American and global energy markets for other types of energy—and the recent trend toward significant increases of the California-based supply of RNG,³ with in-state production increasing from 6.74% in 2021 to 18.23% in 2023—we continue to question why CARB would propose eliminating imported RNG eligibility from any portion of the North American gas system. All RNG projects produce the desired benefits of displacing fossil gas, and most create significant methane reductions. Achieving these benefits should remain the primary focus for California RNG policy.

302.5 Support for the Addition of Sunflower Oil to the List of Virgin Crop-Based Feedstocks with Limited Eligibility for Credit Generation from the Production of Biomass-Based Diesel

SkyNRG supports CARB's proposal in the Second 15-Day Changes to add sunflower oil to the list of virgin crop-based feedstocks that are limited in credit generation potential in the production of biomass-based diesel. With this update in the Second 15-Day Changes, virgin sunflower oil joins virgin soybean oil and canola oil in the twenty percent crediting eligibility limitation on virgin crop-based feedstocks used to produce biomass-based diesel.

³ <u>https://ww2.arb.ca.gov/resources/documents/lcfs-data-dashboard</u>



302.5 cont. We agree that these limits will help avoid sending a long-term signal for virgin crop-based feedstocks to serve California demand. Furthermore, we believe that CARB should continue to focus on shifting demand to advanced feedstocks that can bypass the issues that first-generation biofuel feedstocks face. Given that science-based research has shown that food-based biofuels are linked to emissions from deforestation and other indirect land-use change (ILUC), this shift is particularly important.⁴ We are however concerned about the addition of alcohol to hydrocarbons to the list as a potential Tier 2 eligible drop-in fuel. This could potentially open up a loophole enabling corn ethanol-based SAF which could skirt the cap on biomass-based diesel. For this reason, we would urge careful consideration of this addition.

In addition to the above comments on updates included in the Second 15-Day Changes, SkyNRG continues to urge consideration of the following comments in the proposed LCFS amendments.

302.6 Support for Increased Program Ambition for 2025 and Beyond

We strongly support CARB's intention to increase program ambition for 2025 and beyond. 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 CARB's plans to strengthen the existing emission targets for 2030 and beyond. Therefore, we encourage CARB to adopt what was proposed at the November hearing, because the proposed increase in near-term stringency is needed to address near-term oversupply. 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.

Additionally, we believe CARB should also commit to considering at least a 35% CI reduction by 2030 through a future rulemaking (the ICF analysis shows that a CI reduction of >40% by 2030 is feasible) and that the Auto Acceleration Mechanism should be able to trigger earlier. As a member of the Coalition for Renewable Natural Gas (RNG Coalition), we support their positions on these two topics in their comments on the 15-day amendments.

302.7

Expanding, Not Limiting, Mass Balance Accounting of RNG including to SAF and RD

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. 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. 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.

⁴ Tyler J. Lark, Nathan P. Hendricks, Aaron Smith, Nicholas Pates, Seth A. Spawn-Lee, Matthew Bougie, Eric G. Booth, Christopher J. Kucharik, and Holly K. Gibbs, "Environmental Outcomes of the US Renewable Fuel Standard," Proceedings of the National Academy of Sciences 119, no. 9 (March 1, 2022). https://doi.org/10.1073/pnas.2101084119



302.7 The U.S. RNG industry has evolved with existing regulatory programs at both the federal and state levels cont 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.

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/mass balance accounting for RNG to SAF.

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 to a maturing industry and instills confidence in investment communities to continue to invest in the energy transition of this 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.

302.8 Greater Support for Near-Term Aviation Solutions Particularly SAF

SkyNRG sees sustainable aviation fuel as one of the few near-term, readily available solutions to addressing both carbon dioxide (CO2) and non-CO2 emissions from aviation. For this reason, we remain disappointed by the recent proposal to maintain the LCFS fossil jet fuel exemption.

Achieving California's ambitious goals for the aviation sector will require addressing the structural disincentives for SAF embedded in the status quo. While SAF is eligible to receive credits under the



302.8 cont. LCFS,⁵ the lack of deficits on the fossil jet fuel side decreases the value of SAF as a replacement relative to renewable diesel, which replaces an obligated and therefore more costly fossil fuel. This structural disparity, illustrated by multiple third-party analyses, strongly and systematically incentivizes clean fuel producers to make renewable diesel rather than SAF.⁶ The result: in 2023, 2 billion gallons of renewable diesel were registered by the program but only 23 million gallons of SAF.⁷ It remains unclear what differences exist between aviation and on-road fuels that justify continuation of uneven supportive policies.

For most low-carbon alternative fuels, production remains more expensive than the incumbent fossil alternative. Fundamentally, not obligating traditional fossil fuels ensures that they remain inexpensive relative to low carbon alternatives. Rational fuel users will choose the less expensive option, and even fuel users who want to advance low carbon options will be undercut. This puts a strong chilling effect on the rate of adoption of opt-in fuels.

To ensure that CARB's current proposal does not exacerbate structural disincentives to SAF under the LCFS program, we suggest a modest step that would remove the applicability of the Auto Acceleration Mechanism (AAM) to the table of annual jet fuel benchmarks. The AAM applied to the gasoline and diesel benchmarks can act to control the credit supply by both reducing credit generation for alternative fuels and increasing deficits for fossil fuels. However, without any obligations on fossil jet fuel, the AAM would only undercut support for SAF without creating any corresponding demand.

302.9 In conjunction, we propose that CARB set the jet fuel benchmarks at a level and on a schedule that recognizes that SAF is an emerging, less mature market that has not benefited from higher fossil benchmarks and years of credit generation since program inception in 2010. In the early years of the LCFS program, CARB set small CI reduction targets for gasoline and diesel and modest annual increases to allow the industry (both fossil and alternative) time to complete their investments and ramp up production. CARB can evaluate the jet fuel benchmarks and set them in such a way that supports SAF as an emerging fuel and addresses airline industry concerns about the transition towards increasing low-carbon fuel use. This could include freezing the jet fuel benchmarks, resetting the 2030 jet fuel benchmark targets to their pre-amendment level of 20%, or decoupling the annual increases of the jet fuel benchmarks from those of gasoline or diesel. Notably, British Columbia has adopted a similar approach under their recent LCFS amendments, providing both a higher benchmark and a less aggressive compliance curve for aviation fuels, preserving credit generation opportunities for the emerging SAF industry.

302.10 Further study of the local air quality conditions surrounding California's major airports and the benefit of SAF use to these communities is also recommended. 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.

⁵ We applaud CARB's harmonization of the annual CI standards for diesel and jet fuel following the 2018 Rulemaking. This preserves credit generation opportunities for SAF and reduces some of the structural differences that would otherwise disincentivize SAF production compared to diesel, though significant disincentives remain. ⁶ See Bay Area Air Quality Management District (BAAQMD), Sustainable Aviation Fuel: Greenhouse Gas Reductions from Bay Area Commercial Aircraft. October 2020. Page 56 available at https://www.baaqmd.gov/news-andevents/page-resources/2020-news/121120-saf-report. See also https://stillwaterassociates.com/saf-in-the-iraera-how-do-the-incentives-stack-up/.

⁷ CARB Data Dashboard available at https://ww2.arb.ca.gov/resources/documents/lcfs-data-dashboard



302.10 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 encourage CARB staff to develop policy that drives uptake of SAF that contributes to protecting the health and safety of these workers and airport communities. Fully addressing aviation's impacts requires a committed approach to reducing CO2 and non-CO2 emissions from aviation and there is a growing body of data that SAF offers this in both cases.⁸

Thank you for the opportunity to comment on the latest set of 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 and we look forward to the successful conclusion of the LCFS rulemaking.

Sincerely,

John Plaza President & CEO SkyNRG Americas, Inc.

⁸ https://www.dlr.de/en/vt/research-transfer/faq/faq-sustainable-aviation-fuels

https://www.manchester.ac.uk/discover/news/using-sustainable-aviation-fuels-could-reduce-emissions-by-up-to-80-scientists-find/

https://open.overheid.nl/documenten/ronl-af341f669119e9edbbd2a6ed78f68a7eaa7c9fae/pdf https://www.who.int/health-topics/cardiovascular-diseases#tab=tab_1

SkyNRG Americas, Inc – 2738 NW Potts Ct, Suite 110, Bend OR 97702 – <u>www.skynrgamericas.com</u>



Cynthia Williams Global Director Sustainability, Homologation and Compliance Ford Motor Company One American Road Dearborn, MI 48126-2701

October 16, 2024

Clerk of the Board, California Air Resources Board 1001 I Street Sacramento, CA 95814 *via* https://ww2.arb.ca.gov/lispub/comm/bclist.php

Subject: Ford Comments on the Proposed Low Carbon Fuel Standard Amendments

Dear Chair Randolph and Members of the Board,

Ford Motor Company ("Ford") hereby submits our comments on the California Air Resources Board's ("CARB") Proposed 15-Day Changes to the Proposed Amendments to the Low Carbon Fuel Standard ("LCFS"). We appreciate the opportunity to comment as well as CARB's time and consideration.

303.1

Ford supports the proposed changes to direct up to 45 percent of the base credits generated by light-duty electric vehicle residential charging to the automakers producing those vehicles, which is outlined in the comments submitted by the Alliance for Automotive Innovation as well. Automakers are uniquely positioned and motivated to effectively invest revenue from the LCFS program to advance the electrification of transportation. In California, automakers face the strictest emissions requirements in the world, and a primary limiting factor on the adoption of electric vehicles is consumer concerns about costs and availability of charging infrastructure. With additional revenue from LCFS, automakers' electric vehicles.

With additional revenue, Ford could provide strategic support for residential charging—where most people charge most of the time—and for efforts to integrate electric vehicles into the grid and help ensure these vehicles reduce the grid's carbon intensity while also reducing the cost of electricity for Californians. On this point, Ford supports the comments submitted by the Vehicle-Grid Integration Council ("VGIC") and encourages CARB to include vehicle-grid integration ("VGI") programs as an approved usage for both Base Credit revenue and Electric Distribution Utilities ("EDU") holdback funds. Ford is currently participating in a small-scale pilot program with Sacramento Municipal Utility District to test VGI. With additional revenue, Ford would like to bring these types of VGI programs to additional customers in California in partnership with the California utilities, thus, helping further electric vehicle adoption by creating new value streams for electric vehicle customers and, at the same time, helping to 303.1 cont. support the electric grid by administering VGI programs in coordination with utilities in order to meet the utility goals of increased resilience, infrastructure upgrade deferral, and increased renewable energy utilization.

To date, Ford has only reported residential charging for a small number of Ford drivers in California which has limited the ability to fully utilize the LCFS program's potential to invest and support the customer's EV transition. CARB's proposed amendments would improve Ford's ability to invest in electrification to support EV affordability for customers. Further, Ford requests that CARB consider the fact that Ford does not include a customer's vehicle in the LCFS Incremental Credit program unless and until that customer opts into the program. Ford participates in the Zero-Carbon Intensity pathway in order to offer our customers' the value of carbon free charging at home through the pathway with Renewable Energy Credit purchases, but this adds additional cost into the business case for Ford's participation in the LCFS. We take this approach to help ensure compliance with California privacy laws, and beat customer expectations, given that Ford may need to share with CARB the customer's vehicle identification number and location. As a result, Ford's participation has been limited to generating about 1,200 credits since it began participating in December 2021. This contributed to 3,457 MWh of renewable electricity from solar and wind energy projects via renewable energy credits. However, if all Ford vehicles were eligible to participate as part of the proposed Base Credit generation, we anticipate that Ford would generate almost six times that number of credits for calendar year 2025, equating to approximately 15-16 times the amount of carbon reduction for residential charging. Ford is eager to find ways to participate in the LCFS in a more substantial way while maintaining our high standards for customer privacy.

If you have any questions, please contact Steve Henderson, Vehicle Regulatory Strategy & Planning (shenders@ford.com), or Evan Belser, Policy Strategist and Managing Counsel (ebelser1@ford.com). Thank you for your attention to these comments.

Sincerely,

cimbia Williams

Cynthia Williams



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October 16, 2024

California Air Resources Board 1001 I Street Sacramento, CA 95814 **VIA ONLINE SUBMISSION**

RE: Low Carbon Fuel Standard Second 15-Day Language

The Western Propane Gas Association (WPGA) is pleased to submit its comments in response to the most recent Low Carbon Fuel Standard (LCFS) 15-day language package. Comments are aligned with our previous letter dated August 27, 2024, on the first 15-Day Language.

304.1 We believe that the current draft of the LCFS language creates uncertainty in the marketplace, pushes unnecessary costs onto consumers, and limits the efficacy of the program in reducing CI of existing transportation fuels. We urge CARB to hold off on adopting these amendments to the program.

304.2 AGGRESSIVE COMPLIANCE TARGETS DISRUPTIVE TO CONSUMERS

In the first 15-day language, compliance targets between 2025 and 2030 are adjusted to create a larger drop in Carbon Intensity (CI) reduction than previously proposed. More aggressive short-term compliance targets are above and beyond any staff suggestions from the 45-day language and are not projected to be feasible considering the state's current inability to reach target CI reduction. More aggressive compliance curves would only exacerbate impacts to end-users attempting to procure enough compliant fuel. If current targets cannot be achieved, it is unreasonable to set more stringent targets.

Additionally, these aggressive compliance targets would create disruptions in the existing fuels market and make it more difficult for suppliers to procure the renewable fuels necessary to meet market demand. Renewable fuels with ultra-low CI scores like that of renewable propane, are prime for meeting CI targets set by LCFS. The ripple effect of the proposed increased targets would negatively impact procurement achievability for these key fuels.

304.3 STILL INCORRECT CI FOR CONVENTIONAL PROPANE IN GREET MODEL

For the fourth time, WPGA has attempted to correct the record on the baseline calculation of fossil propane under LCFS – which, as currently calculated, creates additional burdens onto propane consumers without justification.

CARB's GREET4.0 model still incorrectly calculates the baseline CI of conventional propane. See our letter dated April 29, 2023¹ for detailed CI calculations. With the consideration of more aggressive compliance targets under the first 15-day language, this miscalculation would create further undue burden on compliance entities and end-users.

¹ WPGA, Comment Letter, RE: GREET4.0 – Propane Carbon Intensity Calculation, Submitted to CARB April 29, 2023

304.3 cont. WPGA yet again encourages CARB to update its modelling of the CI for conventional propane within the lookup table to result in **80.06 gCO2eq/MJ** due to corrections on:

- Upstream combustion emissions from a CI of 64.84 to 64.58,
- Assumptions regarding refining source from 75% oil/25% natural gas mixture to 59.5% oil/40.5% natural gas within California per Argonne National Laboratory reporting², and
- Transport distance for delivery fewer than 100 miles traveled for final delivery, based upon industry reporting and best practices.

304.4 EXEMPTING AVIATION FUEL CREATES UNCERTAINTY IN OTHER FUELS

While an exemption for all aviation fuels is included in the first 15-day language, there are real concerns about the unintended consequences to other fuels remaining under compliance. Sustainable Aviation Fuel (SAF) is one of the primary refining sources for renewable propane that complies with LCFS. Renewable propane creates fuel that is available for propane used in transportation, particularly in Southern California. By exempting aviation fuel and reducing available credits for SAF, there could be the unintended consequence of drastically reducing SAF production and thereby one of the most available sources of renewable propane – driving up costs for end-users. Likewise, it could drive production of these fuels further out of state and reduce the accessibility of SAF and renewable propane for the markets obligated to use them.

304.5 AAM UNCERTAINTY WILL CREATE ADDITIONAL COSTS OF COMPLIANCE

The Automatic Acceleration Mechanism (AAM) amendments which change the ratcheting mechanism from an annualized assessment to a quarterly assessment, will create unnecessary compliance obligations from fuel marketers and add costs onto fuels for consumers in an effort to potentially meet compliance obligations which may occur.

Any regulated entity under LCFS would need to prepare for potential AAM enforcement upon a **quarterly basis** within the program as opposed to a **yearly basis**, and the potential implications of the pull-forward further cloud the picture of what CI target compliance entities must comply. That uncertainty will, unfortunately, be passed to consumers of these fuels within California as compliance entities prepare for dramatic shifts in deficit costs per gallon of fuel on a relatively short time period.

304.6 LCFS IS NOT MEANT TO NOT PICK WINNERS AND LOSERS

The inclusion of a cap on virgin oil production eligible for crediting under LCFS is a *de facto* selection of winners and losers in an otherwise open market. The underlying goal of the LCFS is to reduce the CI of transportation fuels currently in use within California and incentivize the transition away from fossil fuels. CARB Board members and staff have continually pointed out in discussions that the LCFS program is not designed to affect particular use case outcomes that may be requested by third-parties and advocates, but rapidly decarbonize California's existing fuels sector.

Adding limits on otherwise renewable feedstocks – for which the CI verification pathway can already establish their efficacy at reducing CI or not – creates an inappropriate thumb onto to the scale of production of affordable and available biofuels. The end result will only be increased costs to California consumers without any appreciable dip in CI across the fuels segment.

CONCLUSION

² Backes, S. E., Beath, J., Sebastian, B., & Hawkins, T. R. (2020, September). Sources of Propane Consumed in California. Chicago; Argonne National Laboratory.

304.7 Reasonable compliance targets, accurate CIs, and considerations of impact to renewable fuels production are necessary for an industry shift to meet set targets. We again request that CARB delay or vote to reject these most recent amendments to the program and continue to work with stakeholders on appropriate updates to the rule that protect consumers from unnecessary costs and improve CI reductions across all fuels.

WPGA appreciates the opportunity to submit feedback on the LCFS 15-day language.

Sincerely,

MAMMER

Krysta Wanner Director of Government Affairs, WPGA krysta@westernpga.org



October 16, 2024

California Air Resources Board 1001 I Street Sacramento, CA 95814

RE: Comments of Vehicle Grid Integration Council on the Second Supplemental 15 Day Notices

The Vehicle-Grid Integration Council ("VGIC") appreciates the opportunity to provide comments on the California Air Resources Board's ("CARB") Second Proposed 15-Day Changes to the Proposed Amendments to the Low Carbon Fuel Standard ("LCFS").

305.1 VGIC strongly supports the modifications being proposed by staff in these amendments to strengthen the LCFS program. Given LCFS's success so far, increasing the program stringency is the right step towards furthering its goals: driving California towards the use of cleaner fuels and decarbonizing the transportation sector as a whole.

Additionally, as detailed in the below comments, VGIC reiterates its support for:

- Retaining the December 2023 update pre-approving electric distribution utility ("EDU") holdback funds to be used for VGI initiatives.
- Clarifying that EDU holdback funds may be used for programs supporting *both* equity and vehicle-grid integration ("VGI").
- 305.4 3. Adding an option to allocate base credits to auto original equipment manufacturer ("OEM").

About VGIC

VGIC is a 501(c)6 membership-based advocacy group committed to advancing the role of electric vehicles ("EV") and VGI through policy development, education, outreach, and research. VGIC supports the transition to a decarbonized transportation and electric sector by ensuring the value from flexible EV charging and discharging is recognized and compensated to achieve a more reliable, affordable, and efficient electric grid.

1. VGIC reiterates its support for modifications to the utility holdback programs and allowing utilities to use credits for vehicle-grid integration projects.

VGIC reiterates its support for the modifications to the EDU holdback programs proposed in the original 45-day amendments as retained in the August 15-day updated language and the October 15-day updated language. The amendments reduce the amount of base credits that California's three large investor-owned utilities ("IOUs") must spend on the California Clean Fuel Reward program to 50% and allow more funding to flow to the IOUs' utility holdback programs. It is worth noting that while the California Clean Fuel Reward program was paused several years ago due to low funding availability, significant funding has likely been amassed but not yet implemented since that pause.

CARB proposes a list of equity projects utilities can spend funds on in section 95483(c)(1)(A)5a, including investing in charging infrastructure, EV ridesharing, rebates and incentives for vehicle purchases and leases, and investments in distribution infrastructure. Of critical importance to VGIC and stakeholders working diligently to establish widespread vehicle-grid integration in California, the amendments also provide a list of potential projects in 95483(c)(1)(A)5b that utilities can spend non-equity funds on including:

i. Investments in grid-side distribution infrastructure necessary for EV charging.

ii. Support for vehicle-grid integration with projects such as:

I. Encouraging the optimization of EV charging through education in the following areas: peak demand, rate pricing, grid emergencies, potential power shutoffs, infrastructure deferral, renewable integration, and/or other signals and grid needs to provide grid and customer benefits.

II. Providing program incentives to encourage driver participation in monitored/managed charging, demand response, or vehicle-to-load / vehicle-to-grid applications.

III. Supporting the deployment and installation of bidirectional charging equipment.

IV. Other innovative approaches to promoting and managing EV charging and discharging that provides benefits to customers and the grid.

iii. Hardware and software that decrease the cost of or avoid updates to infrastructure, including load management software or outlet splitting.

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- 305.5 cont. VGIC reiterates its strong support for utilizing utility holdback funding for all of the VGI projects and load management software outlined above. VGI can provide a wide range of benefits including the following recognized by the California Public Utilities Commission ("CPUC"):¹
 - Accelerating the adoption of EVs by providing additional revenue streams that lower the total cost of vehicle ownership for individual owners and fleet operators.
 - Reducing costs to electricity ratepayers by reducing congestion on existing power distribution infrastructure and costly distribution system upgrades, as well as reducing the need to invest in new fossil fuel electricity generation.
 - Supporting further decarbonization of the electric sector by avoiding curtailment of renewables and providing grid services.
 - Accelerating reduction of carbon and criteria pollutant emissions in the transportation sector.
 - Improving grid resiliency and security, including for public safety power shutoff (PSPS) events.

These are all benefits that LCFS revenues and the resulting holdback programs should support.

305.62. VGIC reiterates that CARB should clarify that utility holdback funds may be used
for programs that support *both* equity and vehicle-grid integration projects.

VGIC understands that the list of equity projects provided in 95483(c)(1)(A)5a are approved for the utilities to spend equity funds on. The list in 95483(c)(1)(A)5b describes "examples of preapproved uses for these other holdback credit proceeds." However, VGIC reiterates that CARB should clarify that utilities *can* spend equity funds for the types of VGI projects listed in 95483(c)(1)(A)5b if they are for the benefit of equity customers. This change would inject muchneeded clarity not only to the EDUs tasked with designing programs but also to the CPUC, which may otherwise inadvertently hamstring the EDUs' ability to implement equity-focused VGI programs. Put differently, CARB should clarify that EDUs may use holdback funds on initiatives that simultaneously support the intents of 95483(c)(1)(A)5a (i.e., equity) *and* 95483(c)(1)(A)5b (i.e., VGI).

305.7 3. VGIC reiterates its support for allowing base credits to be allocated to the auto OEMs.

As discussed above, base credits have traditionally been generated by and allocated to the EDUs to spend on the California Clean Fuel Reward program and utility holdback programs and projects. However, the California Clean Fuel Reward program has been suspended since 2022 due to low

¹ CPUC Decision 20-12-029.

305.7 cont. funds. CARB now proposes to pivot the program to focus on medium- and heavy-duty vehicles instead of light-duty.

At the same time, funding light-duty and other projects may remain an appropriate policy direction. VGIC reiterates its support for allowing CARB to allocate up to 45% of base credits to the auto OEMs if less than 30% of model year 2024 new light-duty vehicle sales are ZEVs. Significant increases in light-duty ZEV sales are needed to reach the Advanced Clean Cars II 35% sales requirement in 2026. Allocating base credits to the OEMs to provide additional funding for the ZEV transition will allow California to move towards its clean transportation goals.

If credits are allocated to the OEMs, VGIC reiterates its support for pausing the requirement that EDUs continue to the California Clean Fuel Reward program and allowing the EDUs to focus on holdback programs. As discussed above, utility holdback projects can provide valuable incentives for EV adoption, equity goals, and VGI initiatives.

Conclusion

305.8 VGIC is overall supportive of the Proposed Amendments to LCFS and is excited to continue to work with CARB on achieving California's transportation decarbonization goals.

Sincerely,

<u>/s/Zach Woogen</u> Zach Woogen Interim Executive Director Vehicle Grid Integration Council (VGIC) vgicregulatory@vgicouncil.org

Comment Log Display

Here is the comment you selected to display.

Comment 306 for Proposed Low Carbon Fuel Standard Amendments (lcfs2024) - 15-2.

Bob	Hart	bobh05444@gmail.com		Gas Price Increase	
First Name	Last Name	Email Address	Affiliation	Subject	

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306.1

We regret that the California Air Resources Board (CARB) refuses to need to Stop This Attack On CA. Citizens. You Already Steal To much Californians struggling with the affordability of basic needs. You "A year ago the air board (CARB) estimated that the new regulation it refuses to offer a revised forecast . . . So an unelected bunch rules without weighing the costs to consumers? Doesn't seem right. price of the other 47 continental states. It is with this in mind California motorists are already paying \$1.50 more per gallon for much higher - 65 cents a gallon. Now the air board has backed off concerns about the proposed amendments to the Low-Carbon Fuels proposed LCFS amendments will affect gas prices in California. As Los Angeles Times columnist George Skelton wrote over the ∢ gallon because of refinery costs passed on the consumers. We concur with Skelton's assessment that CARB is being irresponsible at the expense of everyday of regulators can arbitrarily adopt new that we write you again with serious could raise gas prices by 47 cents a its 47-cent price hike estimate. And separate study placed the pump cost gasoline than the national average Standard (LCFS) program that will release any analysis of how its Seems a bit irresponsible and Money From us And Waste it! drive up fuel prices. arrogant." weekend:

Sincerely, Bob

Attachment

Original File Name

 Date and Time Comment Was
 2024-10-19 07:41:47

 Submitted

If you have any questions or comments please contact Clerk of the Board at (916) 322-5594.

Board Comments Home



77 West Wacker Drive Suite 4600 Chicago, Illinois 60601

312-634-8100

October 16, 2024

SUBMITTED ELECTRONICALLY

Re: Comments on October 1, 2024 Proposed 15-Day Changes to Proposed Regulation Order

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

Ms. Sahota:

We have reviewed the Proposed 15-Day Changes to the Low Carbon Fuel Standard (LCFS) 307.1 proposed amendments. As we have noted in past comments, in our direct engagement with the CARB staff and Board, and through our industry associations, ADM believes the changes proposed in August 2024 were ill-advised – for California consumers, the clean fuels market, and ultimately, the program's role in advancing sustainable practices. The latest proposal only serves to deepen our concerns.

307.2 In short, the rapid transition to arbitrary caps for certain feedstocks could lead to <u>fuel price</u> <u>shocks that hurt consumers and businesses</u> without delivering commensurate environmental benefits. According to the *Los Angeles Times*, "In September of last year, CARB estimated that the change could lift gasoline prices 47 cents a gallon, or \$6.4 billion a year."¹ This estimate was made before the supply-constraining feedstock cap was under consideration. The actual increase is likely to be even higher.

We regret that CARB decided not to convene a stakeholder workshop after the summer round of 15-day changes. As we noted in our August 27 comment letter, several proposals were introduced into the last package with no workshop or even prior notice that they were under consideration. Foremost of these is the crop-based feedstock cap for soy, canola, and now sunflower oils. A workshop would have afforded stakeholders the opportunity to hear from CARB staff on the science and data behind why such a cap is necessary. Instead, on both the feedstock cap and new sustainability criteria, we are left to interpret these requirements and trust staff will work in good faith with biofuels producers during implementation.

¹ https://www.latimes.com/environment/story/2024-10-10/california-air-regulators-consider-hiking-gasoline-prices
Following is a summary of our views on these latest changes.

307.3 Impacts on consumer fuel prices: California's state legislature is currently in a rare special session called by Governor Newsom, focused on rising fuel prices. The governor's office noted that the session has been convened in part "to avoid supply shortages that create higher prices at the pump for consumers."²

As a producer of biofuels blended with petroleum products, ADM is concerned about the impacts the proposed LCFS amendments may have on fuel costs. An arbitrary cap on cropbased feedstocks and redundant, hastily designed sustainability requirements will quickly lead to the very supply shortages Gov. Newsom cites. It will force most biofuels out of the California market, and families and businesses across California would pay this price most dearly. This is likely why Democratic State Assemblymember Corey Jackson (D-Perris) recently said, "For me, this special session has been about ensuring that gas prices are going down... And certainly, if CARB is creating regulations that will increase gas prices, we're going to have to take a look at that and see if we have to rein in their authority."³

According to data from the U.S. Energy Information Administration, California fuel prices indeed far outpace the national average.

Gasoline (90% petroleum, 10% ethanol) is the most-used transportation fuel in California, with 97% of all gasoline being consumed by light-duty cars, pickup trucks, and sport utility vehicles. In 2022, 13.6 billion gallons of gasoline were sold, according to the Department of Tax and Fee Administration.⁴ The average California regular grade gasoline price per gallon in 2023 was 36% higher than the national average. Families and businesses bear the burden, and supply and demand realities indicate that further restricting supply in the fuels market is likely to steepen the increase even further in the years ahead.

Regular Grade Gas Price per Gallon, 2023				
Jurisdiction	2023 average price	CA Percentage over national average		
California ⁵	\$4.77	36%		
U.S. nationwide ⁶	\$3.51			

The story on diesel fuel (including biodiesel and renewable diesel) is much the same. Diesel is the second largest transportation fuel used in California, representing 17% of total fuel sales. According to the State Board of Equalization, in 2022, 3.6 billion gallons of diesel were sold.⁷ The average California diesel price per gallon in 2023 was 27% higher than the national average. Business and industry initially bear the burden of these price spikes, but the costs are passed onto consumers, who are hit twice – directly for gasoline and indirectly through everyday commerce that is dependent on diesel-powered heavy-duty trucks, rail, off-road construction equipment, and marine transport.

² https://www.gov.ca.gov/2024/08/31/gas-price-special-session

³ Ibid, Los Angeles Times

⁴ https://www.energy.ca.gov/data-reports/energy-almanac/transportation-energy/california-gasoline-data-facts-and-statistics

⁵ https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=EMM_EPMR_PTE_SCA_DPG&f=A

⁶ https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=EMM_EPMR_PTE_NUS_DPG&f=A

⁷ https://www.energy.ca.gov/data-reports/energy-almanac/transportation-energy/diesel-fuel-data-facts-and-statistics

30/.3 cont

No. 2 Diesel Price per Gallon, 2023			
Jurisdiction	2023 average price	CA Percentage over national average	
California ⁸	\$5.35	27%	
U.S. nationwide ⁹	\$4.21		

All the while, the state is implementing Advanced Clean Cars, Advanced Clean Trucks, and Advanced Clean Fleets programs to increase electric vehicle sales and use in the state. Coupled with these programs is a scheduled phase-out of new internal combustion engine (ICE) vehicle sales in 2035. Drivers and industries will continue using ICE vehicles well beyond 2035, and a traditional fuels market will be necessary to fuel them. The pressure being applied to that market under the latest LCFS proposed amendments now will intensify in the decades to come.

We repeat here our call for a workshop where diverse stakeholders can discuss the impact of these new proposals. In parallel with that workshop, CARB should update its last fuel price estimate (of at least 47 cents higher) to account for the additional supply restrictions the Board is considering. Indeed, as Assemblymember Blanca Rubio (D-Baldwin Park) asserted, "While the Legislature is currently working to address petroleum price spikes through the public process, it is unfortunate CARB is unwilling to provide an estimate of the monetary impacts amendments to the LCFS will have. This process is intended to be public and collaborative."¹⁰

307.4 **Crop-based feedstock cap on oilseeds:** Very few changes have been made to the feedstock cap, despite robust feedback from biofuels producers. One of those changes is particularly troubling, as the latest proposal includes the most restrictive interpretation of the feedstock cap as well – limiting it to 20% of a company's material flowing to California rather than 20% of the company's total biomass-based diesel production. This compounds the supply constraint since integrated biofuel producers have business models established using solely virgin vegetable oils and cannot readily adjust processes for the California market. The punitive cap will force biofuels companies like ADM and American farmers who sustainably grow our feedstocks from the California market.

Several biofuels companies and allied associations have met with CARB staff and Board members over the last six weeks, further elaborating on these concerns. It was clear from the questions asked by CARB in these meetings that the agency would benefit from additional education from and dialogue with our sector. We offer it again here and hope that CARB will commit to it as well, in direct meetings and an additional stakeholder workshop. Without this dialogue, we are left with essentially the same construct first unveiled in August.

We reiterate that the cap lacks a plan to trace origins and components of <u>all feedstocks</u> serving the California market. The U.S. market, particularly the west coast, has seen a large spike in waste oils from countries in Asia, including China. Should these amendments be adopted by the Board next month, these feedstocks would be uncapped, placing U.S. farmers at a significant disadvantage – even farmers practicing regenerative agriculture.

⁸ https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=EMD_EPD2D_PTE_SCA_DPG&f=A

⁹ https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=EMD_EPD2D_PTE_NUS_DPG&f=A

¹⁰ Ibid, Los Angeles Times

At ADM, we know these practices well, and we partner with farmers who carry them out – enough that will allow us to enroll 5 million acres globally by 2025. Our regenerative agriculture program features direct financial support for farmers; easy processes and cuttingedge technologies to ensure low barriers to entry; and a broad range of support and guidance from third-party experts. Through this, we help customers meet emissions commitments and requirements. Yet under the proposed amendments, many of these farmers will be significantly disadvantaged in favor of more difficult to trace and verify products imported from overseas.

307.5 **Sustainability provisions:** Our feedback on the sustainability provisions is consistent with questions and concerns we have raised in comment letters as well as briefings with the agency. For example, we understand that beginning in 2026, fuel producers must collect and submit supply chain data, including spatial data of farm boundaries where feedstocks are sourced; and maintain an attestation letter that assures the feedstocks have not been sourced from lands that were converted after 2008. Likewise, beginning in 2028, fuel producers must obtain third party certification on feedstock sourcing. In each of these cases, we seek clarity on the administration of these requirements and recognition that under the federal Renewable Fuel Standard (RFS), sustainability criteria proposed by CARB are already being met and, in some cases, exceeded. Finally, CARB staff is not suited to be the arbiter of sustainability practices and likely does not have the resources to carry this out.

We request again that CARB at a minimum delay implementation of these sustainability requirements to 2027 or later. As it currently stands, to comply with these new provisions, our company would need to have attestations and spatial data for canola or soy that will be planted within the next six months and harvested next fall (for the 2026 fuel year, reported in 2027). Unless this implementation date is changed, we will be entering into contracts without a full understanding of what is required of us and our farmer partners.

As with the arbitrary cap, these provisions apply only to crop-based feedstocks, not feedstocks derived from waste or animal fats. We previously called to your attention the European Union's emerging Union Database, which will trace all feedstocks, including used cooking and waste oils and crop-based products to ensure integrity of the supply chain. The database is backed by the data and verification practices of the International Sustainability & Carbon Certification (ISCC) and should be a model and resource for CARB.

Our commitment: While we are disappointed with the LCFS amendments process and product, ADM stands ready to continue dialogue with CARB Board and staff, in the weeks until the November 8 Board vote and during programmatic implementation if the Board votes in favor. ADM pioneered renewable fuels decades ago, and we offer our expertise in biofuels, sustainable agriculture, and market dynamics to the entire CARB team to help the LCFS achieve continued GHG reduction, without saddling families and businesses with higher prices.

307.6 Beyond these comments, we associate ourselves with those submitted by Growth Energy, Clean Fuels Alliance America, National Oilseed Processors Association, and California Advanced Biofuels Association – all organizations that represent the interests of our sector, which has achieved much in clean fuels policy.

If you have any questions or need further clarification and detail, please contact me at Greg.Morris@adm.com.

Sincerely,

Augo Auler Man

Greg Morris Senior Vice President President, Ag Services & Oilseeds

cc: Liane M. Randolph, Chair California Air Resources Board

Honorable Board Members

Honorable Steven S. Cliff, Ph.D., Executive Officer California Air Resources Board