California Air Resources Board

Public Hearing to Consider Amendments to the Low Carbon Fuel Standard

Addendum to the Final Statement of Reasons for Rulemaking

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

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I General

This addendum to the Final Statement of Reasons (FSOR) for the rulemaking action entitled "Public Hearing to Consider Amendments to the Low Carbon Fuel Standard" updates the FSOR that the California Air Resources Board (CARB) submitted as part of the final rulemaking package to the Office of Administrative Law (OAL) on January 3, 2025.

On February 18, 2025, OAL disapproved the rulemaking package. On February 25, 2025, CARB received a "Decision of Disapproval of Regulatory Action" from OAL identifying 26 proposed regulatory provisions that OAL determined did not comply with the clarity standard of the Administrative Procedure Act (APA). OAL also noted that the final regulation text and documents incorporated by reference required non-substantive revisions pursuant to Section 40, Title 1 of the California Code of Regulations. On April 4, 2025, a Third Notice of Public Availability of Modified Text and Availability of Additional Documents and Information (Third 15-Day Notice) and Proposed Third 15-Day Modifications to the Proposed Regulation Order were posted for a public review and comment period through April 21, 2025. These proposed Third 15-Day Modifications addressed the concerns noted by OAL in its Decision of Disapproval to provide greater clarity to the Proposed Amendments, and further improved alignment with the objectives of the rulemaking.

This addendum describes modifications made to the regulatory language per the 15-Day changes released on April 4, 2025, as well as non-substantial modifications made to the regulatory language subsequent to those 15-Day changes, and provides CARB's responses to the public comments received during the 15-Day comment period that ended April 21, 2025.

II Modifications Made to the Original Proposal

i Modifications Made in the Third Notice of Public Availability of Modified Text and Availability of Additional Documents and Information

Subsequent to OAL's Decision of Disapproval, CARB staff released a Third 15-Day Notice on April 4, 2025, which notified the public of additional documents added into the regulatory record and presented additional modifications to the regulatory text. In accordance with the Administrative Procedure Act (Gov. Code, § 11340 et seq.) and Board Resolution 24-4, these changes are designed to address concerns noted by OAL and further improve alignment with the objectives of the rulemaking.

The following is a broad summary of changes that were made to the initial proposal and were made available for a third 15-day comment period. Staff proposed modifications to the 2024 Amendments to Sections 95481, 95482, 95483, 95483.1, 95483.2, 95486.1, 95486.2, 95486.3, 95486.4, 95488, 95488.3, 95488.8, 95488.9, 95488.10, 95489, 95491, 95491.2, and 95500, Title 17, California Code of Regulations. For further details on all the modifications, see the "Third Notice of Public Availability of Modified Text and Availability of Additional Documents and Information," available online at https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/3rd_15day_notice.pdf.

- In subsection 95481(a), staff added and/or modified a number of definitions.
- In section 95482, staff changed two instances of "LCFS program" to "LCFS Data Management System."

- In subsection 95482(h), staff added language to allow hydrogen produced with accompanying carbon capture and sequestration (CCS) technology to count toward the 80% renewable hydrogen requirement by 2030, and to exclude hydrogen produced with CCS from the existing phaseout of fossil hydrogen by 2035.
- In subsection 95483(c), staff removed an option for the Executive Officer to direct a portion of base credits to Original Equipment Manufacturers (OEMs) following a specified regulatory trigger.
- In section 95483.2, staff clarified the definition of "LCFS Data Management System."
- In section 95486.2, staff changed three instances of "prior quarter" to "most recent quarter for which data is available."
- In subsection 95486.3, staff modified the derating factor for light- and medium-duty (LMD) hydrogen refueling infrastructure (HRI) stations, and removed language that would have limited the estimated value of LMD-HRI credits generated by a particular station to 1.5 times the initial capital expenditures.
- In section 95486.4, staff clarified how the five-mile distance requirement for shared heavy-duty (HD) HRI and HD fast charging infrastructure (FCI) will be calculated. Staff also modified the derating factor for HD-HRI stations and removed language that would have limited the estimated value of HD-HRI credits generated by a particular station to 1.5 times the initial capital expenditures.
- In subsection 95488(c), staff clarified when fuel pathway holders and applicants should begin using the CA-GREET4.0 model or associated Tier 1 Calculators.
- In subsection 95488(d), staff clarified that the Executive Officer will not accept new fuel pathway applications for biomass-based diesel if the specified conditions are met.
- In subsection 95488.3(d), staff added contextual detail on the models used to calculate the Land Use Change (LUC) values in Table 6, and clarified the conditions under which the Executive Officer will calculate a conservative LUC value.
- In subsection 95488.9(f)(3)(A), staff clarified that the Executive Officer will renew crediting periods for fuel pathways certified before the effective date of the regulation, upon receiving the request.
- In subsection 95488.9(g), staff clarified under which conditions the Executive Officer will approve certification systems or modify, suspend, or revoke the approval status of certification systems.
- In subsection 95488.10(b), staff clarified when the Executive Officer will perform a credit true up for a fuel pathway.
- In subsection 95491(b)(2), staff clarified under which conditions the Executive Officer will issue credits as a partial and limited exception to the prohibition on retroactive credit claims in section 95486(a)(2).
- In section 95491.2, staff clarified the requirements for calibration methods, data substitution methods, and missing data methods.
- In subsection 95500(c)(2)(B), staff clarified the eligibility requirements for deferred verification.

ii Non-Substantial Modifications

Subsequent to the 15-Day public comment period mentioned above, staff identified the following additional non-substantive changes to the regulation:

- Section 95482(c)(2): Added aviation gasoline back into the list of exempted fuels as it was inadvertently deleted in the first Notice of Public Availability of Modified Text and Availability of Additional Documents and/or Information (First 15-day Notice package). In the First 15-day Notice package, staff proposed "to restore the existing exemption for all fossil jet fuel" in section 95482(c). Inadvertently, and unmatched by anything in any Notice package created during the rulemaking process, the regulation order included with the First 15-day Notice package showed the phrase "and aviation gasoline" in subsection 95482(c)(2) to be struck through. Staff have corrected the typographical error in section 95482(c)(2) by restoring the mistakenly struck phrase "and aviation gasoline," consistent with all applicable Notice documents.

The above-described modifications constitute non-substantial changes to the regulatory text because they more accurately reflect the numbering of a section and correct spelling and grammatical errors, but do not materially alter the requirements or conditions of the proposed rulemaking action.

III Documents Incorporated by Reference

The regulation adopted by the Executive Officer incorporates by reference the following documents, in addition to those listed in Chapter III of the FSOR released on January 3, 2025:

- Internal Revenue Service, Guidance Notice 2022-61. Federal Register. Volume 87, No. 229. November 30, 2022, section 95481(a).
- Hydrogen Fueling Capacity (HyCap) Model. March 12, 2025.

These documents were incorporated by reference because it would be cumbersome, unduly expensive, and otherwise impractical to publish them in the California Code of Regulations. The documents are lengthy and highly technical test methods and engineering documents that would add unnecessary additional volume to the regulation. Distribution to all recipients of the California Code of Regulations is not needed because the interested audience for these documents is limited to the technical staff at a portion of reporting facilities, most of whom are already familiar with these documents. Also, the incorporated documents were made available by CARB upon request during the rulemaking action and will continue to be available in the future. The documents are also publicly available, available from college and public libraries, or may be purchased directly from the publishers.

IV Additions and Modifications to the Original FSOR Summary of Comments and Agency Responses

Chapter IV of this FSOR Addendum contains all comments submitted during the Third 15-Day comment period that were directed at the proposed amendments or to the procedures followed by CARB in proposing the amendments, together with CARB's responses, along with

explanation of modifications to Agency Responses in the FSOR. CARB received a total of 80[1] comment letters in this comment period. Each comment letter is responded to in this FSOR Addendum. Commenters included representatives from the electricity and natural gas sectors, refining sectors, health and environmental sectors, reporters and verifiers, airlines, and others.

The individually submitted written comment letters for this Third 15-Day comment period, as well as all comments submitted in prior comment periods, are available here: *https://www.arb.ca.gov/lispub/comm/iframe_bccommlog.php?listname=lcfs2024*.

Note that some comments were scanned or otherwise electronically transferred, so they may include minor typographical errors or formatting that is not consistent with the originally submitted comments. However, all content reflects the submitted comments. All originally submitted comments are available online at the link directly above.

Previously submitted comments that address the Draft Environmental Impact Analysis (EIA) are responded to in the "Response to Comments on the Draft and Recirculated Environmental Impact Analyses Prepared for the Amendments to the Low Carbon Fuel Standard"[2] and in the "Supplemental Responses to Comments on the Environmental Impact Analysis."[3] Additional environmental analysis regarding potential impacts associated with by the proposed modifications is available in the California Environmental Quality Act (CEQA) addendum in Attachment B to Executive Order R-25-001.

Table 1. Written Comments Received During the Third 15-Day Comment Period

Commenter Code	Submitter	Affiliation	Submittal Date
15d3-001	Al Pimentel	No Affiliation	4/8/2025
15d3-002	Cheri Keisner	No Affiliation	4/8/2025
15d3-003	Alec Orozco	No Affiliation	4/10/2025
15d3-004	Tara Lopez	No Affiliation	4/10/2025
15d3-005	Angela Kurdyla	No Affiliation	4/10/2025
15d3-006	Tom Van Heeke	Rivian	4/14/2025
15d3-007	Ryan Kenny	Clean Energy	4/14/2025
15d3-008	Carolann Maccini	No Affiliation	4/16/2025

[1] The Third 15-Day comment letters received shown below are numbered to 81, but numbered comment 27 was deleted because it was a duplicate earlier version of comment 28.
[2] California Air Resources Board, *Response to Comments on the Draft and Recirculated Environmental Impact Analyses*. November 6, 2024. *https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/lcfs_rtc.pdf*.
[3] California Air Resources Board, *Supplemental Responses to Comments*. November 8, 2024. *https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/supprtc.pdf*.

Commenter Code	Submitter	Affiliation	Submittal Date
15d3-009	Chloe Taylor	No Affiliation	4/16/2025
15d3-010	Asher Goldman	Generate Capital	4/16/2025
15d3-011	Ryan Huggins	SRECTrade	4/16/2025
15d3-012	Dan Evans	Promus Energy	4/16/2025
15d3-013	Hossein Tabatabaie	Iwatani Corporation of American	4/17/2025
15d3-014	Kent Grotelueschen	Nebraska Soybean Association	4/17/2025
15d3-015	Thereza Cevidanes	NATSO and SIGMA	4/18/2025
15d3-016	Laura Renger	California Electric Transportation Coalition (CalETC)	4/18/2025
15d3-017	Matt Miyasato	FirstElement Fuel	4/18/2025
15d3-018	Graham Noyes	Noyes Law Corporation for Raizen	4/18/2025
15d3-019	Annalyn Sanders	No Affiliation	4/18/2025
15d3-020	Laura Renger	CA Utilities Coalition	4/18/2025
15d3-021	Alessandra Magnasco	California Fuels + Convenience Alliance	4/18/2025
15d3-022	Olabisi Boyle	Hyundai Motor North America	4/21/2025
15d3-023	Brent Swart	Iowa Soybean Association	4/21/2025
15d3-024	Sam Wade	RNG Coalition	4/21/2025
15d3-025	Patrick Serfass	American Biogas Council	4/21/2025
15d3-026	Martina Simpkins	Anew Climate	4/21/2025

Commenter Code	Submitter	Affiliation	Submittal Date
15d3-028	Tim McRae	California Hydrogen Business Council	4/21/2025
15d3-029	Gal Sitty	Kia Corporation	4/21/2025
15d3-030	Trisha Dello Iacono	CALSTART	4/21/2025
15d3-031	Adam Raphaely	Mercuria Energy America	4/21/2025
15d3-032	Lexi Concannon	3Degrees Group Inc.	4/21/2025
15d3-033	Renee Fordyce	Missouri Soybean Association	4/21/2025
15d3-034	Dan Bowerson	Alliance for Automotive Innovation	4/21/2025
15d3-035	Jeremy Martin	Union of Concerned Scientists	4/21/2025
15d3-036	Nancy Young	Gevo	4/21/2025
15d3-037	Joshua Rahm	American Soybean Association	4/21/2025
15d3-038	Tanya DeRivi	Western States Petroleum Association	4/21/2025
15d3-039	Oscar Garcia	Neste	4/21/2025
15d3-040	Joshua Wilson	POET	4/21/2025
15d3-041	Joseph Hoekstra	International Emissions Trading Association (IETA)	4/21/2025
15d3-042	Brooke Holland	Kern Energy	4/21/2025
15d3-043	Michael Boccadoro	Dairy Cares	4/21/2025
15d3-044	Cassandra Farrant	Amp Americas	4/21/2025

Commenter Code	Submitter	Affiliation	Submittal Date
15d3-045	Gary Grimes	World Energy	4/21/2025
15d3-046	James Greer	Biodiesel Commission of Missouri	4/21/2025
15d3-047	Jonathan Reynolds	Kentucky Soybean Association	4/21/2025
15d3-048	Miles Heller	Air Products	4/21/2025
15d3-049	Kaleb Little	Kansas Soybean Association	4/21/2025
15d3-050	Nicole Rice	California Renewable Transportation Alliance	4/21/2025
15d3-051	Darin Johnson	Minnesota Soybean Growers Association	4/21/2025
15d3-052	Devin Mogler	National Oilseed Processors Association	4/21/2025
15d3-053	Jamie Zweifler-Katz, et. al.	Defensores Del Valle Central Para El Aire & Agua Limpio	4/21/2025
15d3-054	Sherrie Merrow	The Transport Project	4/21/2025
15d3-055	Ben Steyer	Michigan Soybean Association	4/21/2025
15d3-056	Rhiannon Davis	Electrify America, LLC	4/21/2025
15d3-057	Daisuke Yanagisawa	Japan Hydrogen Forum	4/21/2025
15d3-058	Brian Casey	U.S. Venture	4/21/2025
15d3-059	Sean Lock	Monarch Bioenergy LLC	4/21/2025

Commenter Code	Submitter	Affiliation	Submittal Date
15d3-060	Cory-Ann Wind	Clean Fuels Alliance America, California Advanced Biofuels Alliance	4/21/2025
15d3-061	Daniel Berglund	Texas Soybean Association	4/21/2025
15d3-062	Dallas Spiecker	Maas Energy Works	4/21/2025
15d3-063	Andy Foster	Aemetis, Inc.	4/21/2025
15d3-064	Nina Robertson	Communities for a Better Environment, Earthjustice	4/21/2025
15d3-065	Jason Marshall	California Resources Corporation	4/21/2025
15d3-066	Nancy Johnson	North Dakota Soybean Growers Association	4/21/2025
15d3-067	David Pettit	Center for Biological Diversity, Food & Water Watch	4/21/2025
15d3-068	Don Schinskedon	Low Carbon Fuels Coalition	4/21/2025
15d3-069	Christopher Bliley	Growth Energy	4/21/2025
15d3-070	Jamie Hall	Joint MHD Infrastructure Providers	4/21/2025
15d3-071	Alexis Moch	Prologis	4/21/2025
15d3-072	Ron Kindred	Illinois Soybean Association	4/21/2025
15d3-073	Marcelo Queiroz	Minerva Biodiesel	4/21/2025
15d3-074	Scott Richman	Renewable Fuels Association	4/21/2025

Commenter Code	Submitter	Affiliation	Submittal Date
15d3-075	Harry Simpson	Crimson Renewable Energy	4/21/2025
15d3-076	Mikhael Skvarla	California Hydrogen Coalition	4/21/2025
15d3-077	Stefan Maupin	Tennessee Soybean Association	4/21/2025
15d3-078	Alfredo Arredondo	Green Hydrogen Coalition	4/21/2025
15d3-079	Fred Ghatala	Advanced Biofuels Canada Association (ABFC)	4/21/2025
15d3-080	Andrew Craig	California Bioenergy LLC (CalBio)	4/21/2025
15d3-081	Colin Murphy	UC Davis Institute of Transportation Studies	4/21/2025

CARB has summarized and responded to the written comments on the LCFS amendments and the process by which they were adopted. These comment summaries and responses are sorted by subject matter listed below.

The following notes about the comments and responses will help with understanding how the comments are structured and labeled:

- Each comment has a unique code, as identified in the table above. Each code indicates the comment period or context of the submission, followed by a unique number for each comment submitted within that comment period or context. For example, comment "15d3-001.1" indicates a comment received during this Third 15-Day comment period: "001" is the unique number identifying the letter that contains the comment and ".1" indicates a specific comment within that letter. These additional sub-comment codes are shown in the copies of the comments included as Attachment 1 to this Addendum.
- Comments are grouped thematically by section and subsection. Each individual comment excerpt is preceded by "Comment:" and followed by its comment identification code, allowing readers to distinguish among individual comment excerpts.
- Comments are excerpted verbatim unless otherwise noted. In some instances, comment excerpts are preceded by the statement, "Commenter says," with the comment excerpt in quotation marks. In other instances, the verbatim excerpt is presented without any preface or quotation marks. Comments that have been

summarized, rather than quoted, are preceded by “Summary:” and are not followed by quotation marks.

- In verbatim comment excerpts, CARB has not corrected or noted errors in the original (for example, by adding “[sic]”). Comment excerpts’ formatting may differ from the formatting of the original comment.
- Footnotes in comments generally have been omitted, though the footnote numbers may remain in the text of the comment excerpt.
- In general, CARB has noted where it made changes in response to the comment. Where it is not noted, no changes were made in response to the comment.
- The following letters were determined to be out of the scope of this comment period and/or not relevant to the LCFS, and are therefore not addressed in the agency responses below: 15d3-001, 15d3-002, and 15d3-019.

The following comments and agency responses are additions or modifications to the FSOR released on January 3, 2025. CARB has noted in the agency responses where a particular response in this Addendum supersedes the corresponding agency response in the earlier FSOR.

i Comment Responses

A General Support

A-1 *General Support for the Low Carbon Fuel Standard*

Comment: 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. While we remain concerned about the program’s evolution away from its successful technology-neutral, performance-based framework – including through artificial limitations on avoided methane crediting and book-and-claim accounting for biomethane – we are generally supportive of the amendments adopted at the November 8, 2024 Board Meeting and the minor adjustments reflected in the 3rd 15-Day Changes. (15d3-044.3)

Agency Response: No changes were made in response to this comment. Staff appreciates the commenter’s support for the LCFS.

A-2 Multiple Comments: *Support for Proposed Amendments*

Comment: CalETC appreciates this opportunity to SUPPORT the Low Carbon Fuel Standard (LCFS) regulation. CalETC believes that the changes contained in the Third 15-day Change Amendments address the concerns raised by the Office of Administrative Law (OAL) as well as incorporating changes identified in CARB Board Resolution 24-14 upon adoption of the LCFS amendments on November 8, 2024. (15d3-016.1)

Comment: We recognize and commend the efforts made by CARB to enhance the clarity and precision of the regulatory language in response to the Office of Administrative Law’s (OAL) direction. The updated language contained in the 15-Day Changes addresses the ambiguity concerns raised by OAL, contributing to improved regulatory transparency and compliance. (15d3-018.1)

Comment: The CA Utilities believe these changes address the concerns raised by the Office of Administrative Law (OAL) as well as incorporating changes identified in CARB Board

Resolution 24-14 upon adoption of the LCFS amendments on November 8, 2024. (15d3-020.1)

Comment: Dairy Cares generally supports CARB's Third Set of 15-day Changes which respond to the Office of Administrative Laws ("OAL") Decision of Deficiency. We appreciate CARB's thoughtful responses to the OAL to ensure this rulemaking process timely concludes**.** (15d3-043.1)

Comment: As noted in our comments from October 16, 2024, we believe that the LCFS amendments proposed and subsequently adopted by the CARB Board on November 8, 2024 (hereafter referred to as the adopted amendments), achieved an appropriate balance in the treatment of biomethane under the LCFS. They enable renewable natural gas (RNG) to provide significant emission reductions in the near-term while remaining a source of energy to power zero-emission platforms like electricity and hydrogen in the future.

Consequently, CRTA declared the adopted amendments supportable because they prioritized the capture and reuse of methane while taking the necessary steps to reinvigorate a restless investment market and continue California's leadership on its signature climate change policy.

The adopted amendments brought much-needed stability to the LCFS market. In response to the prolonged three year discussion surrounding the changes, the LCFS credit market was experiencing historic lows that dropped credit prices into the low-$40s, threatening the program's viability. Credit prices had shown positive improvement, increasing into the low $70 once the amendments were adopted. However, the OAL disapproval decision caused them to once again plunge into the mid-to-low $50s.

Prolonged consideration of OAL's decision would have only worsened this deteriorating situation, which is why we appreciate CARB staff moving quickly on its revisions.

Further, we believe the adopted amendments to the LCFS represents CARB staff's effort to develop a data-driven, science-based strategy for aligning the LCFS program with California's broader emission reduction objectives. We also disagree with Program opponents notion that the LCFS is the primary driver of overall retail fuel prices in California. Despite recent criticisms, market experts have concluded that the LCFS is not a major driver of consumer gas prices in California. Despite historically low credit prices in 2024, California's gas prices have remained among the highest in the nation.

The adopted LCFS amendments are needed to maintain investment confidence and allow the state to continue expanding the availability of affordable, lower-carbon fuels to improve air quality and enhance public health in California. We trust OAL will move as quickly to approve the adopted amendments to ensure the continued availability of affordable, lower-carbon transportation fuel to improve air quality and enhance public health in California. (15d3-050.1)

Comment: The LCFS amendments proposed by CARB staff represent significant efforts that are appreciated and which TTP continues to support. It is our belief that California should continue to be fuel neutral through the LCFS, using national standards and the Argonne GREET model to determine the best LCFS credit generators.

…

In California, the use of low-carbon fuels including renewable diesel and renewable natural gas have produced most of the emissions reductions to date, demonstrating the need to retain these fuels while ZEV technology, charging/fueling and supply reach full operational capacity. There is no one solution to the pressing environmental issues facing the transportations sector.

The LCFS with the proposed amendments will deploy those technologies and solutions that are readily available, maximize cost-effective emission reductions, and provide a real pathway to carbon neutral/negative emissions. (15d3-054.1)

Comment: Electrify America supports CARB's overall direction in the proposed changes, which reflect targeted updates responsive to stakeholder input and aligned with concerns raised by the Office of Administrative Law. (15d3-056.1)

Comment: While the LCFC previously expressed concerns for specific provisions on the record during the rulemaking process, specifically those that move further away from the technology neutrality that has been a hallmark of the LCFS program's success, the modified amendments strike a balance to accelerate progress toward California's ambitious climate goals and restore investor confidence, while minimizing LCFS program cost and potential impact on California drivers.

The extended rulemaking process has stalled the momentum of the LCFS program by failing to send the long-term market signal and credit value needed to generate investments.

The LCFS had ***significantly outpaced its targets as of April 2024***, achieving carbon intensity reductions ***3 years ahead of schedule*** and **at lower cost than anticipated**. Prospective estimates by the California Air Resources Board (CARB) and various others had projected up to $1.80/gallon in conjunction with previous rulemakings. The actual current estimate is 8-10 cents/gallon. Nonetheless, an unsubstantiated barrage of claims on the cost of the LCFS program and the price that consumers pay have obscured fundamental realities relating to the performance of the LCFS program:

- A definitive study on consumer price impacts by Bates White showed that there is ***no correlation between LCFS program credits prices and retail gas prices***. An FAQ from CARB updated this analysis to show that this lack of correlation has continued.
- The primary drivers of gas prices are the cost of petroleum, followed by fuel taxes and fees added directly to price of a gallon at the pump.
- Compliance costs have remained consistent over time, ***increasing carbon reductions for the same cost***.
- ***The LCFS has diversified the fuel market, which has created price competition to ease the burden on drivers***. For example, renewable diesel is regularly cheaper at the pump than petroleum diesel and can be used in existing vehicles, which has resulted in ***replacing almost 3/4. of the diesel in California with renewable and waste sources***; ethanol has been up to $2.50/gallon cheaper than gasoline for flex-fuel vehicles that can use E85; home charging for EVs is significantly cheaper per mile.
- ***The overall compliance cost of the LCFS is minimized by a more flexible and fuel technology-neutral approach to decarbonization***.
- As presented in CARB's April 10 workshop, a more restrictive program that reduces opportunities for credit generation by limiting viable and affordable low-carbon fuels ***achieves fewer carbon reductions, raises health effects and associated costs, relies more heavily on petroleum-based fuels***, and ***raises the cost of the program overall***.
- In turn, ***a more restrictive and costly LCFS program increases both the likelihood and potential magnitude of consumer price impacts***.

California is at a pivotal moment in the fight against the increasing effects of climate change. The LCFS program is a lynchpin to decarbonize transportation and achieve the goals

established under AB32. The program has ***significantly exceeded expectations for greenhouse gas reductions***, and done so at ***far less than anticipated cost***.

To continue and build on this success, the Low Carbon Fuels Coalition and members below support the technical revisions reflected within the Modified Text for the Proposed LCFS Amendments. (15d3-068.1)

Comment: We believe that the Third 15-day Changes address the concerns raised by the Office of Administrative Law (OAL). These amendments also appropriately incorporate direction from California Air Resources Board Resolution 24-14 following the November 8, 2024 meeting and vote on adoption of the LCFS program amendments.

The undersigned companies: EV Realty, Forum Mobility, Greenlane, Highland Electric, Prologis Mobility, Terawatt Infrastructure, Voltera Power, WattEV, and Zeem Solutions are providers of electric vehicle charging infrastructure for medium- and heavy-duty trucks, including shared depots that serve multiple fleets at a single location. As noted in our prior comments, we believe the LCFS program supports transportation electrification by facilitating infrastructure deployment, lowering fueling costs, and incentivizing the purchase of zero-emission vehicles.

The amendments adopted in November of 2024 and further clarified in this latest 15-Day Notice strengthen an already powerful program. (15d3-070.1)

Comment: The GHC appreciates CARB's leadership in advancing clean fuels via the LCFS program and is especially excited by the added ambition in the targets being set by updated regulation. This program is widely considered one of the most successful programs in North America in achieving the deployment of lower carbon fuels and the GHC applauds CARB staff for their thoughtful and forward-thinking proposed modifications to the LCFS. (15d3-078.1)

> **Agency Response:** No changes were made in response to these comments. Staff appreciates the commenters' support for the proposed amendments.

B Definitions

B-1 *Support for Modifications to Definitions*

Comment: We appreciate the addition of a definition of "Break ground" to add additional clarity to the rule. (15d3-044.8)

> **Agency Response:** No changes were made in response to this comment. Staff appreciates the commenter's support for the proposed amendment.

B-2 *Definition of "Clean Fuel Reward"*

Comment: We also believe that modifying the definition to not preclude rebates for high-priority and federal fleets given the paused status of the Advanced Clean Fleets regulation is prudent. We suggest modifying the definition as follows:

§95481(a)(29): *"Clean Fuel Reward" is a statewide program established by EDUs to provide a reduction in price for new and/or used commercial medium- or heavy-duty electric* <u>*and fuel-cell*</u> ~~*vehicles that are not subject to the High Priority and Federal Fleets requirements as specified in, title 13, California Code of Regulations, section 2015(a)(1)*~~ *in California. The Clean Fuel Reward is funded exclusively through LCFS proceeds generated by EDUs from electricity fuel.* (15d3-048.5)

Agency Response: No changes were made in response to this comment. The focus of the Clean Fuel Reward on electric medium- and heavy-duty vehicles and zero-emission motorcycles (ZEMs) is responsive to Board direction in Resolution 24-14. For more information on this Board direction, see Resolution 24-14, which is available at: *https://ww2.arb.ca.gov/sites/default/files/barcu/board/res/2024/res24-14.pdf*.

B-3 *Definition of "Break Ground"*

Comment: CARB's response to OAL's Disapproval Decision suffers from several flaws. First, the change is not responsive to the OAL's Disapproval. OAL took issue with the definition's failure to adequately articulate whether construction activity is required following breaking ground; OAL did not take issue with the particular actions an entity must take to break ground. Additionally, CARB's change makes the definition internally inconsistent. As written, the definition requires "earthmoving and site preparations" to break ground, but would also allow an entity to "break ground" purely through financial commitments. OAL is likely to issue another disapproval decision on these grounds unless CARB rewrites the definition.

Expanding the definition of breaking ground to apply to simply incurring five percent of the cost of a facility will likely increase the availability of credit generation by factory farms. Numerous provisions governing crediting for fuel derived from livestock manure provide more credit opportunities for projects that "break ground" before a specified date. *See, e.g.,* Section § 95488.8(i)(2)(B) (biomethane from projects breaking ground after December 31, 2029 must comply with pipeline delivery requirements); Section § 95488.9(f)(3)(A) (pathways for natural gas produced from livestock manure that break ground after December 31, 2029 only eligible for avoided methane crediting through December 31, 2040); Section § 95488.9(f)(3)(A) (pathways for hydrogen or electricity produced from livestock manure that break ground after December 31, 2029 only eligible for avoided methane crediting through December 31, 2045); Section § 95488.9(f)(3)(B) (rule restricting avoided methane crediting in the event of direct regulation requiring methane reductions from factory farms only applies to projects that break ground after December 31, 2029).

Making it easier for factory farm biomethane projects to "break ground" will inevitably increase the incentive to produce methane pollution for fuel production—and, in turn, LCFS credits. Unlike the non-substantive clarifications in *Californians for Safe Prescriptions*, 19 Cal.App.4th at 1146, expanding the definition to apply to purely financial commitments substantively changes the effect of the definition of "Break ground." CARB must hold a public hearing to consider this change. *See* Gov't Code § 11349.4(a). Similarly, making it easier for factory farms to qualify for longer crediting periods will substantially increase the severity of those significant environmental impacts identified in the EIA, as well as those CARB fails to acknowledge. 14 Cal. Code Regs. § 15162(a)(1). CARB must conduct supplemental environmental review to adequately analyze how expanding the definition of "Break ground" will impact air and water quality in the communities surrounding factory farms. (15d3-053.3)

Agency Response: No changes were made in response to this comment. The change made to the definition of "Break ground" is responsive to item 1.25 in OAL's Decision of Disapproval. As modified, the definition is designed to provide clarity on when project construction activities can be demonstrated to have begun by providing a more specific definition and specifying that continuous construction or continuous efforts must be demonstrated after breaking ground. This modification reflects the underlying intent, mentioned in Agency Response to FSOR Appendix A comments B-7, that "construction activity should begin shortly after breaking ground."

Staff proposed to clarify that the applicable definition of "break ground" has the same meaning as "Beginning of Construction" used for federal investment tax credits, by incorporating by reference the detailed definition of that term IRS guidance Notice 2022-61. That incorporated definition is complementary and fully consistent as it lays out two methods, either of which may be used to establish that construction of a facility begins: "(i) by starting physical work of a significant nature (Physical Work Test), and (ii) by paying or incurring five percent or more of the total cost of the facility (Five Percent Safe Harbor)."

The commenter objects that the proposed incorporation of the Five Percent Safe Harbor test for a demonstration of the beginning of project construction activity could make it easier for a project proponent to make such a demonstration. In fact, satisfying the specified criteria for the Five Percent Safe Harbor provides more clarity on when project construction activity has begun than the previous definition of "break ground." The incorporated definition specifies that the Five Percent Safe Harbor may be satisfied only with a demonstration that a taxpayer has paid or incurs 5% or more of the total cost of the facility, and that "the taxpayer makes continuous efforts to advance towards completion of the facility."[4]

For explanation of why no supplemental environmental review is necessary for this modification, please see Agency Response to Section D-5.

B-4 *Definition of "Quality-Assured Data"*

Comment: We also want to note for staff that the proposed definition of "quality assured data" may lead CARB to require accuracy demonstrations for equipment that is explicitly exempt from metrology requirements under the California Department of Food and Agriculture Division of Measurement Standards (DMS) regulations (CCR Section 4002.111). We look forward to working with CARB to ensure implementation remains aligned with DMS requirements and avoids unnecessary market disruption. (15d3-056.3)

Agency Response: No changes were made in response to this comment. Meter calibration is important to maintain the accuracy of reported values that result in credit generation under the LCFS program.

C Aviation

C-1 *Aviation Gasoline Should Be an Exempted Fuel*

Comment: CARB should exempt aviation gasoline from program requirements**.** (15d3-038.8)

Comment: The Program Revisions Should Exempt Aviation Gasoline.

WSPA urges CARB to revise §95482(c)(2) to exempt both jet fuel and aviation gasoline, rather than just jet fuel. CARB previously proposed to include intrastate jet fuel in the revised regulations, but later removed this provision. At that time, staff informed WSPA that "aviation gasoline" should *not* be stricken from this exemption. Consistent with this interpretation, WSPA

[4] Department of Treasury. November 30, 2022. Notice 2022-61. Available at *https://www.federalregister.gov/documents/2022/11/30/2022-26108/prevailing-wage-and-apprenticeship-initial-guidance-under-section-45b6bii-and-other-substantially*.

requests that aviation gasoline be expressly listed as an exempted fuel. Currently, the rule defines “aviation gasoline” in §95481 but does not make use of that definition. (15d3-038.21)

> **Agency Response:** This topic is beyond the scope of the modifications described in and released with the Third 15-day Notice. Staff acknowledge that the deletion of the aviation gasoline exemption was made in error, and have made non-substantial changes as identified in Section II.ii of this Addendum (Non-Substantial Modifications) to correct the typographical error identified by the commenter.

D Avoided Methane Crediting

D-1 Multiple Comments: *Oppose Changes to Crediting Period Approvals*

Comment: In response to OAL, CARB replaced the word “may” with “shall” and added language providing that the pathways which qualify for renewal are those that “continue to meet applicable eligibility requirements.”13 CARB thus eliminated the Executive Officer’s discretion to refuse to renew crediting periods for those pathways that “meet applicable eligibility requirements.” As Commenters explained repeatedly in prior comments, by allowing more crediting periods for pathways certified before January 1, 2030, the LCFS Amendments provide a significant incentive for factory farms to expand their herds and install methane-producing infrastructure in the near-term. With this change, the LCFS amendments will now provide an even greater incentive for factory farms to act quickly and take advantage of the guaranteed renewal periods. Additionally, because “applicable eligibility requirements” provide no guardrails against factory farms deliberately increasing their methane pollution for capture and LCFS credit generation, these guaranteed renewal periods will significantly increase the motivation and certainty of multi-decade financial rewards for bad actor operations that pollute more to profiteer off the LCFS. (15d3-053.4)

Comment: Modifications to § 94588.9 (f)

We note changes in § 95488.3 (f) that clarify the Executive Officer’s responsibilities related to pathway renewal for biomethane pathways derived from anaerobic digestion of livestock manure. We reiterate a discussion from our October 16th comment letter that questions whether guaranteed renewals of biomethane pathway certification with full avoided methane credits are necessary to achieve state methane reduction goals, and discuss how such automatic recertification disagrees with principles of good LCA methodology. We are finalizing a report that reviews current scientific literature on the topic of LCA methodology for assessing GHG impacts of anaerobic digestion (we have shared, under embargo, a preliminary copy with LCFS program staff for their review and will publish it as soon as possible). This review finds that current LCFS methodology specifies a counterfactual for the purposes of assessing avoided methane credits (open lagoons) that is uncommon among comparable studies. This paper identified 107 studies that reported GHG emission results from life cycle assessment of livestock AD at scales relevant to commercial application, 55 of which discussed counterfactual specification for assessing avoided methane credits in scenarios relevant to commercial application and with enough detail that we were able to ascertain the counterfactual being compared against. Of these 55 directly relevant studies, 9 used open lagoons as the counterfactual. An additional 21 specified other open storage (though likely lower-emitting) counterfactuals. The body of literature on commercial-scale operations in the U.S. was comparatively small, making it hard to ascertain how representative our sample is of projects that would seek LCFS pathways certification, but the diversity of counterfactual specifications under LCA study suggest the current counterfactual assumption in the LCFS may not align with typical practices in peer-reviewed scientific literature, and the extent to

which it adequately characterizes the pool of likely LCFS applicants (to serve as a Tier 1 default) deserves exploration. The choice of open lagoons as a counterfactual may, in aggregate, yield CI scores that overestimate GHG benefits of such projects. Guaranteed recertification of pathways that adopt this counterfactual ensures that such overestimates would persist in the LCFS for multiple decades. (15d3-081.5)

Agency Response: No changes were made in response to these comments. The proposal to clarify that the CARB Executive Officer will (rather than "may") renew crediting periods for specified dairy and swine manure pathways that continue to meet the regulatory eligibility requirements is responsive to item 1.6 in OAL's Decision of Disapproval. As noted, the pathways must meet the regulatory eligibility requirements, which are unchanged, for the CARB Executive Officer to approve a crediting period renewal. Because the applicable requirements are unchanged, this clarification modification does not change implementation of the associated underlying substantive provisions (crediting period renewals) of the regulation.

For more information on the policy supporting the amendment proposals for renewals of crediting periods within the context of an overall phase-out of LCFS crediting for the use of fuels derived from biomethane in transportation, please see the following Agency Responses in Appendix B of the FSOR: Z-1.3 and Z-1.4. For responses to comments regarding baseline assumptions for LCA modeling of dairy biomethane, see Master Response 5 from the *Response to Comments on the Draft and Recirculated Environmental Impact Analyses Prepared for the Amendments to the Low Carbon Fuel Standard*.[5] The Tier 1 calculators for biomethane capture appropriately modeled baselines (counterfactual scenarios) which are supported by science, established LCA methods, and applicable regulations. Applicants are required to follow the same principle in calculating CI scores for biomethane pathways under a Tier 2 classification. The proposed LCFS regulation includes specific traceability and other requirements for specified source feedstocks including biomethane supplied using book-and-claim accounting.

D-2 Multiple Comments: *Support Methane Crediting Changes*

Comment: Gevo Supports CARB's Confirmation of Three Ten-Year Crediting Periods for Early Adopters of Avoided Methane Projects (Section95488.9(f)(3)(A))

In its OAL Decision, the OAL objected to the provision in Section 95488.9(f)(3)(A) stating that the Executive Officer of CARB "may" renew crediting periods for already certified avoided methane emissions projects from dairy and swine manure and landfill-diverted organic waste disposal for three 10-year periods, as the OAL found that the conditions under which the Executive Officer "may" do so were unclear. (OAL Decision, at 9). Gevo always understood the provision to mean that the Executive Officer "shall" do so as long as the avoided methane emissions projects meet applicable LCFS compliance requirements. CARB's explicit use of the word "shall" in the proposed revision to Section 95488.9(f)(3)(A), coupled with the clarification that the "shall" is conditioned on the requirement that avoided emissions projects must "otherwise continue to meet applicable eligibility requirements," is a helpful clarification and fully responsive to the OAL's comment. Accordingly, while Gevo continues to believe, as we

[5] California Air Resources Board. *Response To Comments on the Draft and Recirculated Environmental Impact Analyses Prepared for the Amendments to the Low Carbon Fuel Standard*. November 6, 2024. Available at: *https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/lcfs_rtc.pdf*.

spelled out in our previous comments, that no time limits should be placed on crediting periods for avoided methane projects, we support CARB's clarification that the Executive Officer "shall" at least renew crediting for already certified avoided methane emissions projects for three 10-year periods. (15d3-036.2)

Comment: We support added clarification proposed on key elements of the program, including changing provisions related to avoided methane crediting and credit true up from "may" to "shall." (15d3-044.7)

> **Agency Response:** No changes were made in response to these comments. Staff appreciates the commenters' support for the proposed modifications.

D-3 Multiple Comments: *Eliminate Avoided Methane Crediting*

Comment: The current flaws in the LCFS, such as "avoided methane crediting" and inaccurate life cycle assessments, not only enable pollution but disproportionately harm low-income communities and communities of color. Factory farms, predominantly situated in these marginalized areas, inflict severe damage on air, water, public health, rural economies, and overall quality of life. I urge you to consider and prioritize the following reforms to the LCFS: Eliminate "avoided methane crediting" in 2024. (15d3-008.1)

Comment: Remove the 10-year "grace period" for factory farm gas producers. (15d3-008.2)

Comment: Stop double counting by allowing factory farm gas projects paid for and claimed by other programs to sell LCFS credits as well. (15d3-008.3)

> **Agency Response:** No changes were made in response to these comments, which are outside the scope of any specific modification proposed in the Third 15-Day modifications package. For responses to objections to the proposed amendments associated with avoided methane crediting for anaerobic digestion of methane emissions from livestock manure, see Master Response 1 from the *Response to Comments on the Draft and Recirculated Environmental Impact Analyses Prepared for the Amendments to the Low Carbon Fuel Standard*[6] and the Agency Response to comments Z-1.2 ("Eliminate Avoided Methane Crediting for Anaerobic Digestion of Methane Emissions from Livestock Manure") in FSOR Appendix B.

D-4 *Department of Treasury Approach to Avoided Methane Crediting*

Comment: Moreover, CARB's reliance on rules developed by the Department of Treasury ("Treasury") is particularly problematic given how Treasury treats avoided methane crediting for factory farms. On January 15, 2025, Treasury promulgated final regulations implementing the credit for production of clean hydrogen and certain provisions of the energy credit as enacted by the Inflation Reduction Act of 2022 ("Clean Hydrogen and Energy Credit Regulations").[28] On January 15, 2025, Treasury also promulgated final regulations regarding the clean electricity production credit and the clean electricity investment credit established by the Inflation Reduction Act of 2022 ("Clean Electricity Production and Investment Credit Regulations").[29] Under the same regulatory regime CARB cites favorably to and proposes to

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[6] California Air Resources Board. *Response To Comments on the Draft and Recirculated Environmental Impact Analyses Prepared for the Amendments to the Low Carbon Fuel Standard*. November 6, 2024. Available at: *https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/lcfs_rtc.pdf.*

adopt text from, the Treasury has taken a very different approach with respect to the perverse incentives created by rewarding manure methane emissions.

Instead of ignoring the obvious problem of perversely incentivizing factory farms to produce more pollution to capture LCFS credits as CARB staff has done and continues to do, Treasury readily acknowledges the "risks of perverse incentives" and sought to establish guardrails against this problem.[30] In both rulemakings, Treasury states that "the magnitude of the incentive provided by the" credits create "a significant risk of additional waste production in response to the credit."[31] Treasury warns that "crediting the additional waste with avoided emissions would result in inaccurate credit determinations."[32] Treasury provided examples of how factory farms could increase their methane pollution to take advantage of lucrative crediting, including by:

> Shifting management practices for existing quantities of manure from land application to lagoon, thereby significantly increasing methane generation;
>
> On the margin, making new or expanded concentrated animal feeding operations (CAFOs) more profitable (whether by increasing the overall numbers of animals raised, or by consolidating smaller existing operations) and thereby inducing additional manure and methane generation; and
>
> Using management practices at biodigesters to produce more methane than would have been produced otherwise (for example, increasing the temperature at an anaerobic digester).[33]

Treasury also recognizes the significant uncertainty around leakage, noting the "range of leakage rates from operations capturing and upgrading manure-derived methane," which could introduce a "risk of over crediting in estimating a GHG emissions rate."[34]

In light of these realities and concerns, Treasury took a more careful approach and assigned a weighted average carbon intensity for all manure-derived fuels of -51 grams of CO2eq/MJ—*not* the free-for-all, race to the bottom engendered by CARB's approach under these LCFS amendments. Treasury's approach to avoided methane crediting demonstrates that Commenters' concerns with the LCFS are well-founded, and that there are alternative, more cautious approaches available to CARB. Additionally, Treasury's rulemakings directly undercut CARB's unsupported position that there is no link between avoided methane crediting and herd expansions. (15d3-053.3a)

> **Agency Response:** No changes were made in response to this comment. This comment objects to CARB's proposal to incorporate by reference the IRS definition of "Beginning of construction" because the Department of Treasury, commenters argue, takes a different approach than the LCFS to recognition of avoided methane emissions.
>
> Whether or not the Department of Treasury takes a different approach than the LCFS to recognition of avoided methane emissions, in a different program with different scope, is irrelevant to whether the incorporated definition of "Beginning of Construction" provides needed clarification to CARB's section 95481 definition of "break ground." For more information on how the incorporated definition of "Beginning of Construction" provides clarification to CARB's section 95481 definition of "break ground," please see Agency Response to comment B-3.
>
> For more information on CARB's responses to objections to potential impacts associated with avoided methane crediting, including the potential for increases in herd

sizes within large-scale livestock operations and the associated adverse environmental impacts of the increase in size of these farms, please see Master Response 1 from the *Response to Comments on the Draft and Recirculated Environmental Impact Analyses Prepared for the Amendments to the Low Carbon Fuel Standard*,[7] as well as Agency Response Z-1.2 in FSOR Appendix B.

D-5 *Amendments that Altered the Effect of Avoided Methane Provisions Require Additional Environmental Review and CARB to Readopt the Amendments*

Comment: In response to OAL's Disapproval, CARB made changes to Sections 95488.9(f)(3)(A) and 95481 that significantly modified the effect of the LCFS Amendments to provide an even greater incentive for factory farms to expand their herd sizes, manage their waste in ways that maximize methane emissions, and install anaerobic digesters, while simultaneously failing to clarify the confusing language OAL took issue with in the first instances. The changes made to these Sections trigger the requirement delineated in Government Code Section 11349.4 for CARB to re-adopt the LCFS Amendments in a properly noticed public hearing. Additionally, because the changes will worsen the already-significant environmental impacts of the LCFS, CARB cannot approve these changes without first preparing a subsequent environmental impact analysis pursuant to Public Resources Code Section 21166.[7]

…

Here, CARB made significant changes that altered the effect of provisions governing the treatment of avoided methane crediting for fuel derived from livestock manure, requiring CARB to readopt the LCFS Amendments.

CARB's obligation to readopt the LCFS Amendments triggers a distinct requirement to adequately analyze the environmental impacts of the changes made in response to OAL's Disapproval Decision. Where a public agency makes a subsequent decision to approve a portion of a project that the agency has previously approved, CEQA requires the agency to supplement its previously-certified EIR/EIA if "substantial changes are proposed in the project which will require major revisions of the previous EIR … due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects." 14 Cal. Code Regs. § 15162(a)(1). In these circumstances, the lead agency must prepare a Subsequent EIR/EIA (*id*.), unless the changes are relatively minor, in which case the lead agency may prepare a Supplemental EIR/EIA (*id*. § 15163). Here, the changes CARB made to the provisions governing avoided methane crediting for fuel derived from livestock manure will intensify the already-significant impacts of the LCFS Amendments, necessitating supplemental environmental review.

…

The APA requires CARB to readopt the LCFS Amendments in a public hearing because CARB substantively changed the effect of this provision. Gov't Code § 11349.4(a). This change goes well beyond those at issue in *Californians for Safe Prescriptions v. California State Bd. of Pharmacy* (1993) 19 Cal.App.4th 1136, the only reported case to consider whether changes to

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[7] California Air Resources Board. *Response To Comments on the Draft and Recirculated Environmental Impact Analyses Prepared for the Amendments to the Low Carbon Fuel Standard*. November 6, 2024. Available at: *https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/lcfs_rtc.pdf.*

a regulation made in response to an OAL disapproval required a public hearing. There, the petitioner unsuccessfully challenged numerous changes to a regulation governing the tasks that non-pharmacists can do in pharmacies. *Id*. at 1142. The originally adopted regulations provided, for example, that a non-licensed person may do certain pharmacy tasks "subject to prior review by a pharmacist." *Id*. at 1145. After OAL disapproval, the agency changed the regulation to provide that a non-licensed person may do certain tasks "at the direction of the pharmacist." *Id*. at 1145. The court held that this was not a significant change because it did not substantively affect the meaning of the regulatory provision. *Id*. at 1145-46. Unlike that change, CARB's change here alters the effect of Section 95488.9(f)(3)(A) by removing the discretion of the Executive Director to not renew crediting periods for factory farm gas pathways. CARB must hold a public hearing to consider this change.

This change will result in a "substantial increase in the severity of previously identified significant effects," (14 Cal. Code Regs. § 15162(a)(1)), thus also triggering a need for further environmental review. CARB itself acknowledged that the LCFS Amendments would have numerous significant air and water quality impacts, due in part to the LCFS Amendments causing an increase in the number of anaerobic digesters installed at factory farms.[14] The reason CARB concluded that the LCFS Amendments would cause an increase in the installation of anaerobic digesters is that the amendments "incentivize the collection and use of biomethane gas from dairies."[15] CARB's change would further incentivize the installation of anaerobic digesters on large dairies and other factory farms, thereby substantially increasing the severity of the significant impacts identified in the EIA.

Similarly, this change will increase the severity of the significant impacts associated with herd expansion, which CARB failed to acknowledge in the EIA. As Commenters have consistently explained, voluminous data demonstrates that expansion of herds is a reasonably foreseeable compliance response to the LCFS Amendments. The faulty nationwide and statewide data CARB relied on in its Recirculated DEIA did not come close to providing substantial evidence supporting its position that there is no link between the LCFS and herd expansion.

Indeed, since the November 2024 approval of the LCFS Amendments, more evidence showing the effect of the LCFS on herd expansion has surfaced, both in California and beyond the state's borders. On April 1, 2025, CARB approved a pathway application submitted by Five Points Pipeline LLC for a collection of five dairies in the San Joaquin Valley that confine a total of 32,200 cows, each of which previously installed anaerobic digesters.[16] Commenters submitted comments opposing the pathway application, noting that, according to CARB's own data, the largest of the five dairies grew by over 50% between 2013 and 2015, during the same time period that it applied for and received state funding to upgrade a decommissioned digester and initiate operations. Since 2022 and leading up to being approved to generate avoided methane credits, the dairy has grown an additional 15 percent – to 10,700 cows.[17] Despite the clear fact that this operation has increased its methane emissions with no attempt to mitigate them in the leadup to applying for the LCFS, CARB will now reward those decisions by crediting Five Points Pipeline LLC for capturing a portion of that intentionally generated methane pollution.

On March 28, 2025, CARB certified fuel pathway B0698 for a collection of factory farms in Arizona. Commenters submitted comments opposing this fuel pathway application, in part because of herd expansion. One factory farm included in the B0698 fuel pathway was previously included in the B0308 fuel pathway, which CARB certified in June 2022, allowing it to profit from avoided methane crediting. Under the B0308 fuel pathway, the factory farm reported a herd size of 10,700 cows.[18] When CARB recently certified the B0698 fuel pathway,

that same factory farm reported a herd size of 18,500 cows—7,800 more cows than it had in 2022.[19] This represents a herd expansion of over 70% in the less than three years that this factory farm has participated in the LCFS and profited from avoided methane crediting. Another factory farm in the B0698 fuel pathway did not exist until 2016, five years after the inception of the LCFS. Yet the LCFS now rewards this factory farm for capturing the methane from nearly 6,000 cows.[20]

On March 26, 2025, CARB approved fuel pathway B0725 for a collection of factory farms in Iowa. Commenters also submitted comments opposing this fuel pathway application, in part due to herd expansion incentivized by the LCFS. Commenters noted that the number of cows on this collection of factory farms had nearly doubled since the beginning of the LCFS program.[21] Notably, the largest factory farm in the application did not exist until 2016—five years after the LCFS began.[22] That same factory farm expanded its herd by 66% from 2022 to 2024. Another one of these factory farms recently got a permit to expand its operations by another 45%.

Taken together, these new fuel pathways demonstrate that the LCFS is perversely incentivizing rapid herd expansion both within and beyond California's borders and even encouraging the creation of new factory farms. And the timeline shows that avoided methane crediting in the LCFS has supercharged this perverse incentive. Now, CARB seeks to reward these massive, recent herd expansions with lucrative LCFS credits.

As with the installation of anaerobic digesters and foregoing manure management that does not produce large methane emissions, the change made by CARB will further incentivize factory farms to expand their herds to take advantage of *guaranteed* avoided methane crediting periods during which factory farms can increase their financial returns by generating more methane pollution. Environmental review is needed to analyze the impacts associated with increased herd expansion. (15d3-053.1)

> **Agency Response:** No changes were made in response to this comment. Please see the Agency Responses under sections B-3 and D-1 for more information on how CARB's proposed clarification modifications respectively addressed the OAL Decision of Disapproval feedback items 1.25 and 1.6.
>
> Because neither the clarification to subsection 95488.9(f)(3)(A) nor the clarification to section 95481 modifies the scope or effect of the underlying substantive provisions, neither significantly changes the substantive provisions of the regulation. The modifications to the definition of "break ground" in section 95481 clarify the close connection between the term "break ground" and the beginning of construction, consistent with the intent of the provision. The subsection 95488.9(f)(3)(A) clarification modification from "may" to "shall" is applicable to the same underlying crediting period renewal conditions. Both clarification modifications will ensure consistency in implementation without changing compliance responses. Accordingly, the Third 15-day Notice appropriately included a determination that the modifications included in the package:
>
> > "do not change implementation of the regulation in any way that affects the conclusions of the Final Environmental Impact Analysis (EIA) certified by CARB with Resolution 24-14. The modifications primarily consist of clarifications that do not alter the compliance responses or associated identified environmental impact conclusions. Any modifications that may affect compliance responses do not result in any new reasonably foreseeable significant environmental impacts or

substantially increase the severity of an identified environmental impact. Therefore, the Final EIA adequately addresses the modifications, and no additional environmental analysis is required."

This conclusion is also supported in the CEQA addendum prepared by CARB staff in support of the proposed modifications and included as Attachment B to Executive Order R-25-001. The potential impacts the commenter identifies are those previously identified in their previous comments, which CARB addressed in previous Response to Comments. The commenter does not identify any significance findings from the Final EIA that would change as a result of these 15-day changes. For more information on CARB's responses to objections to potential impacts associated with avoided methane crediting, including whether it is reasonably foreseeable that the Proposed Amendments could lead to increases in herd sizes within large-scale livestock operations and the associated adverse environmental impacts of the increase in size of these farms, please see Master Response 1 from the *Response to Comments on the Draft and Recirculated Environmental Impact Analyses Prepared for the Amendments to the Low Carbon Fuel Standard*,[8] as well as Agency Response Z-1.2 in FSOR Appendix B.

E CA-GREET and Tier 1 Calculators

E-1 Multiple Comments: *Retain the Option to Update Tier 1 Calculators*

Comment: CARB should retain provisions allowing it to update data and modeling for "Tier 1 CI Calculators" between LCFS rulemakings (15d3-038.4)

Comment: CARB Should Retain the Ability to Create New, and Update Existing, Tier 1 CI Calculators Between LCFS Rulemakings

CARB's Third Notification of Public Availability of Modified Text and Availability of Additional Documents and Information indicates that §95488.3(b)(9) is "unnecessary." However, this section provides important flexibility for CARB to modify the LCFS Tier 1 Calculators between rulemakings – especially if errors are identified – as data availability and modeling methodologies are continuously updated and improved for new and existing feedstocks. Without the ability to create new, and update existing, Tier 1 CI calculators, or correct incorrect or out-of-date data, feedstock sourcing will suffer – leading to inefficiencies and higher costs. Striking §95488.3(b)(9) eliminates an opportunity for the Executive Officer to approve new and updated Tier 1 CI calculators between rulemakings. (15d3-038.13)

Comment: For example, we note that the 3rd 15-Day Changes removes text related to updates to Tier 1 Calculators, as that text is deemed unnecessary. We support that change and agree it is unnecessary, however that does not mean that CARB should not retain the ability to update Tier 1 calculators through a deliberate public process, should there be good rationale for doing so. We would appreciate future guidance on this point, describing how Tier 1 calculators will be updated moving forward, and we look forward to continuing to work with CARB on this and other provisions, to ensure the program is implemented in the most streamlined and effective manner possible. (15d3-044.10)

[8] California Air Resources Board. *Response To Comments on the Draft and Recirculated Environmental Impact Analyses Prepared for the Amendments to the Low Carbon Fuel Standard*. November 6, 2024. Available at: *https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/lcfs_rtc.pdf.*

Agency Response: No changes were made in response to these comments. The removal of language related to Tier 1 Calculator updates in section 95488.3(b) is responsive to item 1.2 in OAL's Decision of Disapproval. Any future changes to Tier 1 Calculators will be made through a public process consistent with applicable requirements, including the Administrative Procedure Act.

E-2 *Provide an Updated Transition Schedule*

Comment: Reporting Requirements: §95488(c) updated the transition period for fuel pathway holders to use CA-GREET 4.0 for new pathway applications from January 1, 2025 (as was adopted in November 2024) to the yet-unknown effective date of the final amendments. For such provisions that were otherwise to have become effective on January 1, CARB should provide a reasonable transition period – such as transitioning new pathway applications from CA-GREET 3.0 to CA-GREET 4.0. A transition schedule described in a table or plain language would provide program participants with important clarity if they are considering a fuel pathway submission in 2025. (15d3-038.11)

Agency Response: No changes were made in response to this comment. The modifications to the transition period for fuel pathway holders to use CA-GREET4.0 and associated Tier 1 Calculators in section 95488(c) do clarify an updated transition schedule to most effectively match any potential anticipated effective date for the amendments. The modified amendments clarify that all pathway applications submitted after the effective date must use GREET4.0 and associated Tier 1 Calculators.

E-3 Multiple Comments: *Support for Proposed Amendments*

Comment: Transition to CA-GREET 4.0 (95488(c)): Neste supports the proposal to begin use of the CA-GREET 4.0 model with the 2025 Annual Fuel Pathway Report. (15d3-039.7)

Comment: We appreciate and support clarification around timing and use of the CA-GREET4.0 model and associated Tier 1 CI Calculators. (15d3-044.5)

Agency Response: No changes were made in response to these comments. Staff appreciates the commenters' support for the proposed amendments.

F Credit True Up

F-1 Multiple Comments: *Clarify True Up Requirements*

Comment: CARB should clarify requirements for credit true ups. (15d3-038.7)

Comment: 6. CARB Should Clarify the Role of the Margin of Safety in Assessing Credit True Ups.

CARB is proposing to revise §95488.10(b) to remove the Executive Officer's discretionary authority to perform credit true ups after an annual verification, and instead base credit true ups on "the previously certified CI, including any margin of safety, that was used for credit generation during the compliance year." This language is ambiguous and unclear. WSPA requests that CARB clarify whether the "margin of safety" newly referenced is meant to mean that a regulated entity must first exceed that margin and then only receives credit above that, or if that newly referenced margin is part of the difference that would be awarded – and provide example scenarios for regulated entities. (15d3-038.20)

Agency Response: No changes were made in response to these comments. The changes in the language in 95488.10(b) related to eligibility for a credit true up are

responsive to item 1.10 in OAL's Decision of Disapproval. The “margin of safety” referenced is a value selected by the fuel pathway holder to be added to their verified CI. This process is already defined in subsection 95488.4(a) in the current regulation, and referenced in sections 95488(c)(1) and 95488.10(a)(6) in the proposed amendments. The added mention of a margin of safety in modifications to subsection 95488.10(b) further clarifies the basis upon which the credit true up is determined. This response supersedes response SS-4 in Appendix C of the FSOR released on January 3, 2025.

G Crop-Based Fuels

G-1 Multiple Comments: *Concerns about Executive Officer Authority to Stop Accepting New Pathways for Biomass-Based Diesel*

Comment Summary: The commenters are very concerned about CARB’s decision to give the Executive Officer authority to stop accepting new pathways for biomass-based diesel starting in January 2031. The commenters do not understand how this benefits the LCFS. It is unclear to commenters how requirements to minimize costs and maximize GHG reductions are served by rejecting new pathways. Commenters assert that the LCFS is best served by allowing the most available and equitable 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. The commenters urge CARB to continue to allow equitable pathways forward with no date of denial. (15d3-014.1, 15d3-023.1, 15d3-033.1, 15d3-037.1, 15d3-047.1, 15d3-049.1, 15d3-051.1, 15d3-055.1, 15d3-061.1, 15d3-072.1, 15d3-077.1)

Comment: CARB should remove provisions categorically excluding new fuel pathway applications for biomass-based diesel. (15d3-038.3)

OAL’s disapproval identified concerns regarding the Executive Officer’s (EO) discretion to decline new pathway applications for biomass-based diesel if the number of unique Class 3-8 ZEVs reported or registered in California exceeds 132,000 ZEVs or near-zero emission vehicles (NZEV) on December 31, 2029, in accordance with §95488(d). CARB is proposing to address this concern by removing the EO’s discretion and instead stating that it “shall not” accept new applications if the conditions in §95488(d) are met. This creates a risk of limiting the EO’s flexibility to respond appropriately to future conditions that are not foreseeable at this time and may limit innovative technologies that could have significant greenhouse gas (GHG) reduction benefits both in California and in other LCFS markets where ZEV/NZEVs are not as prevalent. This rigid approach is fundamentally inconsistent with LCFS’s foundational principles of using market-based mechanisms to incentivize emission reductions in a technology-neutral manner. Further, by constraining potential pathway applications, CARB is failing to achieve the “maximum technologically feasible and cost-effective greenhouse gas emission reductions” in accordance with California Health & Safety Code (HSC) §38560 and is foregoing new fuel pathways which may be more efficient and lower CI than existing pathways. This flexibility is particularly important for developing diesel substitute products as older fuel pathways may be retired. 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. WSPA requests that §95488(d) be stricken in its entirety. If there are in fact a critical mass of Class 3-8 ZEV/NZEVs in the market

in the future, the demand of biomass-based diesel will naturally drop, with no need to preempt the review of fuel pathway applications. (15d3-038.12)

Comment: For consideration for improvement, we raise concern with the new proposal to effectively end new biodiesel (BD) and renewable diesel (RD) pathway applications under Section 95488(d). This new proposal introduces uncertainty that will impact investment decisions in new, long-term innovations such as the development of new feedstocks and energy efficient operations. It also brings uncertainty to existing pathway holders renewing or updating an existing pathway. Uncertainty impacts production decisions or investments in not only RD but also SAF. Additionally, this proposal essentially favors those that use older technologies and not those that produce the lowest cost fuel. This can lead to potentially higher costs for the California consumer. Neste recommends that CARB reprioritize technology neutrality to ensure that California consumers receive renewable energy at the lowest cost possible and the lowest CI. (15d3-039.2)

Comment: Neste opposes the proposal to stop accepting new pathway applications for biomass-based diesel starting in 2031 if certain ZEV mandates are met in 2029 (95488(d)). This proposal is arbitrary and brings uncertainty to the RD market precisely when companies are evaluating further investments, for example in SAF production. Given the interconnectivity between the economics of SAF and RD, this proposal could discourage SAF development in the long-term. This provision also creates uncertainty for those with existing BD or RD pathways (and SAF pathways). It is unclear how CARB will handle existing pathways that are being renewed and/or updated to account for new calculation methodologies and/or renewable fuel production changes. Fuel production changes could be as simple as changes in feedstock sourcing and, if this proposal is adopted, it is unclear if CARB will deem these as new fuel pathways. It is also unclear if changes in ownership would result in existing pathways being deemed new fuel pathways. Given the lack of clarity on how this new provision will apply to existing BD/RD pathways and the uncertainty it creates for future SAF production, Neste therefore recommends that CARB reject this proposed provision. (15d3-039.4)

Comment: Changing this provision from a “may” to a “shall” is of great concern to Clean Fuels and CABA. We question the perceived connection between Class 3 – 8 (medium- and heavy-duty or MHD) vehicles and biomass-based diesel (BMBD) pathways. While we understand that theoretical connection between the electrification of MHD vehicles and the consumption of biomass-based diesel, it does not reason to have this provision in this regulation. CARB staff have publicly acknowledged the need for low-carbon BMBD even when electrification becomes the primary pathway to decarbonization in the MHD sector in California. And why would CARB not approve even lower-carbon BMBD pathways in the future? That seems to be counter to the continuing effort to decarbonize all of California’s transportation fuels. In addition, many of the Class 3 – 6 (medium-duty) vehicles are gasoline fueled and have no impact on the consumption of diesel fuels. If anything, it would make more sense if this provision were restricted to just diesel-fueled vehicles or just Class 7 – 8 vehicles. (15d3-060.1)

Comment: This section states, “the Executive Officer shall not accept new fuel pathway applications for biomass-based diesel, if the number of unique Class 3-8 ZEVs reported or registered in California exceeds 132,000 ZEVs or NZEVs on December 31, 2029.” The reference of Class 3-8 is not a valid reference for diesel fuel given many of these vehicles are gasoline-powered. The replacement of gasoline-powered engines by ZEVs is not relevant. CARB should change the reference to Class 5-8 vehicles. (15d3-075.1)

Comment: The modified language in section § 95488 (d) (‘the Executive Officer shall not accept new fuel pathway applications for biomass-based diesel, if the number of unique Class

3-8 ZEVs reported or registered in California exceeds 132,000 ZEVs or NZEVs on December 31, 2029') should be updated in consideration that Classes 3 – 8 is an exceedingly broad a category of vehicles. ZEV penetration may be higher in lower Classes, with Classes 7 -8 lagging behind. We suggest that specific ZEV penetration values be created for Classes 7 – 8 to ensure that new biomass based-diesel pathway holders are able to produce fuels for this harder-to-decarbonize vehicle category as the LCFS program continues. (15d3-079.1)

Comment: ABFC reiterates stated concerns submitted in October 16th on the previous 15-day comment period regarding the 20% credit generation limit in § 95482 (i). ABFC suggests that CARB take a 'risk-based approach' that relies on quantitative analysis to determine which feedstocks are subject to any type of credit creation limit. 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. This approach keeps the LCFS as a 'science-based policy' that makes decisions based on evidence and objective data. (15d3-079.2)

> **Agency Response:** No changes were made in response to these comments. The modification from "may choose not to" to "shall not" in subsection 95488(d) is responsive to item 1.5 in OAL's Decision of Disapproval. See Agency Responses to BB-2, BB-6, and BB-9 in the FSOR Appendix B for further information.

H Land Use Change (LUC)

H-1 Multiple Comments: *Support for Proposed Amendments*

Comment: In particular, we welcome the explicit recognition and incorporation of more regionalized tools, such as MapBiomas, in the Land Use Change (LUC) section. This is a valuable step forward in capturing land use dynamics with greater granularity and local accuracy. This recognition of regional tools and expertise reflects CARB's openness to integrating credible, science-based data sources from producer countries like Brazil to inform carbon intensity determinations.

We are hopeful that these improvements will pave the way for a more nuanced and precise assessment of LUC emissions, particularly for sugarcane-based biofuels. (15d3-018.2)

Comment: NOPA supports CARB's refinements in Subsection 95488.3(d), which bring greater clarity and predictability to how Land Use Change (LUC) values will be determined. Specifically, the clarification that a conservative LUC value will only be used when no applicable Table 6 value exists is a welcome improvement. (15d3-052.2)

Comment: RFA supports the revision in the Third 15-day Changes specifying that "the Executive Officer will calculate a conservative LUC value only if an entity's fuel pathway application does not exactly match the biomass/region/fuel combination in Table 6, and if no Table 6 value is appropriate." In our comments submitted on August 27 and October 16, 2024, RFA had addressed the previous language in 95488.3(d) Accounting for Land Use Change, and we appreciate the State's responsiveness to the concerns of RFA and other stakeholders. (15d3-074.1)

Comment: Neste appreciates CARB clarifying in section 95488.3(d)(2) how it will determine LUC values for regions/biomass/fuel combinations not currently contemplated in Table 6 of the LCFS regulation. Neste supports the use of best available and peer reviewed data to ensure LUC is accurately accounted for, especially for innovative feedstocks that apply climate smart agricultural (CSA) practices. By accurately evaluating LUC for innovative feedstocks CARB will help drive production of renewable energy such as SAF, while also addressing concerns with

deforestation and most other concerns with crop-based feedstocks. Neste looks forward to CARB applying the best available data on LUC values developed in the future. (15d3-039.5)

Comment: We also support the shift from the term “crop” to “biomass” for improved regulatory consistency. These changes enhance transparency and provide greater certainty for fuel pathway applicants, helping reduce unnecessary regulatory risk. (15d3-052.3)

> **Agency Response:** No changes were made in response to these comments. The clarifications on calculating and assigning LUC values are responsive to item 1.1 in OAL's Decision of Disapproval.

H-2 Multiple Comments: *Updating iLUC Values*

Comment: The Land Use Change Accounting Approach in Section 95488.3(d) Overstates Potential Impacts and Has Internal Inconsistencies

The method CARB cites in 95488.3(d)(1) for accounting for land use change (“LUC,” which, in CARB’s usage addresses the potential for indirect land use change, or “iLUC”) employs the GTAP-BIO model, which uses economic modeling to estimate LUC rather than empirical land change data. This is a modeled, not observed, land-use effect. It assumes that using agricultural land for biofuel feedstocks in one area indirectly causes agricultural expansion into other areas. ILUC modeling is highly speculative and riddled with inconsistencies. A 2022 review from IEA Bioenergy found that past iLUC models of corn ethanol were poor predictors of future land use change and suggested that assumptions underlying iLUC predictions needed to be fundamentally revisited (IEA Bioenergy, 2022). Indeed, the U.S. Environmental Protection Agency’s (“EPA”) data from the National GHG Inventory suggest that total U.S. cropland is decreasing despite higher volumes of biofuel production, demonstrating that empirical data do not support the conclusions of most iLUC models. Accordingly, in 2024, the U.S. Department of Energy’s Argonne National Laboratory (“ANL”), along with EPA and the U.S. Department of Agriculture (“USDA”), updated iLUC and indirect emission values for implementation of the Section 45Z Clean Fuel Production tax credit. While the LUC value asserted for U.S. corn ethanol in Section 95488.3(d) stands at ~19.8 g CO2e/MJ, the iLUC value ANL determined in 2024 for U.S. corn ethanol is ~5.75 g CO2e/MJ, a significant decrease. In light of the most recent data, CARB should revise its LUC factor. (15d3-036.3)

Comment: Third, § 95488.3 (d) references satellite imagery data as a primary source to support estimates of land use change impact. Satellite imagery of land cover is a valuable source of such data and routinely utilized in this field. It is important to note, however, that satellite imagery has limitations that impact how it might be used for LCFS ILUC estimation. Land imaging satellites directly sense electromagnetic radiation, and use a variety of mathematical methods to resolve signals carried by such radiation into estimates of the extent of different types of land cover. There is both underlying measurement error in such imagery, as well as continued debate over the most appropriate methods for assigning land classifications based on satellite imagery.

Estimates of changes to land use or cover based on regional or continental satellite data may also overlook impacts that occur elsewhere. ILUC is a global phenomenon; changes in biomass availability or cost may induce changes in land use in distant markets. Existing research has identified the linkage between U.S. or European biofuel consumption and deforestation in Southeast Asia, for example. A 2024 CA State Auditor’s report reinforced this conclusion. A hypothetical pathway using novel feedstock (i.e. not represented in Table 6) grown in the U.S. could provide high-quality satellite imagery covering the entirety of North America, and yet this would still not cover the geographies that may be affected by land use

change resulting from the use of this fuel. The absence of land use change impacts discernible via regional satellite imagery may mean that such impacts are occurring elsewhere, or that other factors are inducing unrelated changes that obscure the LUC signal from biofuel development. As such, satellite imagery alone, especially when confined to the region in which feedstock is cultivated, is an inadequate protection against ILUC risk.

More importantly, however, satellite imagery can only show things as they exist today or in the past. In many scenarios relevant to LCFS support for biofuels, and indeed in the modeling framework underpinning current ILUC modeling, the ILUC changes most relevant for pathway certification purposes are the ones that have yet to occur, because novel fuel production pathways are unlikely to be present at their full scale when a given fuel+feedstock combination is first certified. That is to say, the increased demand for feedstock that would drive ILUC may not have occurred at the time satellite imagery was collected for the purpose of pathway certification. Alternative fuel producers often seek certification of a pathway based on data from pilot plants or other first-of-kind commercial deployments. If such a pathway is granted, they or other producers may replicate the model for both crop cultivation and fuel production, massively expanding the amount of fuel produced under that pathway, or similar ones, and therefore the amount of area affected by related land use change. Satellite imagery may accurately show minimal land use impacts resulting from the activity used as the basis for certification *at the time of pathway certification*, however additional impacts may be much more apparent as production achieves larger scales; this could result in changes to the per-gallon or per-MJ estimates of LUC impact, especially when dealing with novel crops or approaches to cultivation. Putting such a heavy emphasis on satellite imagery exposes the program to significant risk that ILUC estimates for fuel+feedstock combinations not present in Table 6 would dramatically underestimate actual impacts.

Additionally, the proposed changes to language in § 95488.3 (d) could be interpreted as limiting the consideration of LUC effects to only those that can be assessed via satellite imagery. Doing so would create a risk that LUC impacts that could reliably be assessed via modeling, aerial or drone imagery, land use surveys, or other methods may be overlooked.

In total, the proposed changes to § 95488.3 (d) clarify many of the key terms referenced in this section and more clearly delineate the responsibilities and authority of the Executive Officer with regards to ILUC assessment. They do not substantively address concerns we, and other authors, have raised about the LCFS approach to ILUC in general, including the fact that the analysis underpinning Table 6 is outdated and assumes a supply shock far smaller than actual biofuel capacity growth in the U.S. At the November 8th hearing, CARB Executive Board members instructed staff to hold an expert convening to review current science on ILUC, this is a critical first step in a critically important process to examine approaches to ILUC assessment and risk mitigation. Our work on the LCFS and related alternative fuel policies has repeatedly shown that ILUC can exert a significant impact on the CI scores of biofuels and must be adequately accounted for by policies like the LCFS to ensure that assessed GHG impacts align with actual ones and send appropriate associated incentive signals.

Unrelated, and in addition to the above concerns, we note a shift from the use of the word “crop” to the word “biomass” in several places in § 95488.3 (d). This shift aligns with current understanding of biofuel land use impacts; land use change impacts are not solely limited to crop-based feedstocks, they can be observed in a variety of non-crop ones, too. As such, this change improves the ability of this section to accommodate the full range of biomass that might contribute to biofuel production in the future. (15d3-081.4c)

Agency Response: No changes were made in response to these comments. An update of Table 6 LUC values is beyond the scope of the proposed amendments, but a public forum on LUC values is forthcoming as directed by Board Resolution 24-14. For more information see Agency Response AA-1 in Appendix B of the FSOR. For more information on Board direction, see Resolution 24-14, which is available at: *https://ww2.arb.ca.gov/sites/default/files/barcu/board/res/2024/res24-14.pdf*. The changes to 95488.3(d) are responsive to item 1.1 in OAL's Decision of Disapproval.

As explained in Agency Response AA-3 of Appendix B of the FSOR, modeled LUC values are global estimates of direct and indirect LUC associated with increased biofuel demand and market-mediated effects, while empirical LUC considers direct land use conversions associated with crop feedstocks in a specific region. The empirical LUC assessment is a mechanism to assign more conservative LUC values to feedstocks sourced from regions not included in the previous GTAP/AZEF LUC analysis.

H-3 Multiple Comments: *Modeling Framework*

Comment: Further, while Gevo appreciates the clarifications CARB has made regarding when a new LUC assessment will be made, the new revisions have further confused the method that will be used to do the assessment. While subsection 95488.3(d)(2) stipulates that a conservative LUC value will be calculated "based on the same modeling framework specified in subsection 95488.3(d)(1)", it goes on to say that the Executive Officer will use satellite-based, empirical estimates of land cover change for the calculation. These two statements are at odds with one another. The method cited in 95488.3(d)(1) refers to the GTAP-BIO model, which uses economic modeling to estimate LUC rather than empirical land change data. Economic modeling accounts for induced land use change effects outside the feedstock being analyzed, for example, among other crops and among non-biofuel sectors. Hence, the scope of LUC considered in an economic model is broader than if one simply looks at the land footprint of the feedstock in question using empirical data. Applying an economic modeling approach to some feedstocks and an empirical approach to others will mean that feedstocks are not being assessed fairly and consistently and could disadvantage existing feedstocks that have already been assessed through economic modeling. (15d3-036.4)

Comment: Second, § 95488.3 (d) (2) states that this "conservative" value shall be calculated based on the "same modeling framework" as in § 95488.3 (d) (1), which describes the basic function of the GTAP and AEZ-EF models. It is not clear what the "same modeling framework" means. This could be interpreted to require the use of the same GTAP and AEZ-EF models as were used to provide the LUC adjustment factors adopted in 2016, updated versions of the same model, or equivalent models that adopt the same basic structure - using an economic equilibrium model to determine land changes and an emission factor model to quantify GHG emissions resulting from such changes.

As a term of art used within the research and modeling community, the term "modeling framework" would typically, though not exclusively, be used to describe a conceptual or methodological approach, but not a specific model or version. Multiple models could be described as sharing a modeling framework if they use similar definitions or terminology, data sources, or methodological approaches. When discussing models like those referenced in § 95488.3 (d) (1), we would suggest that the "same modeling framework" requirement is most reasonably interpreted to mean an economic equilibrium model for assessing land use changes and a land use change emission factor model to quantify GHG impacts of such changes. This could mean that models other than GTAP and AEZ-EF would satisfy the "same modeling framework" requirement, though they would need to align their system boundary and

other analytic assumptions with those from the earlier CARB analysis where possible, to allow direct comparison with the results presented in Table 6.

Interpreting § 95488.3 (d) (2) to require the use of GTAP and AEZ-EF, or to specify even greater methodological overlap with the 2016 analysis that led to the values presented in Table 6 would limit the analytical tools available to CARB for the purpose of estimating ILUC impacts of biofuels and force the program to rely on existing models regardless of their performance. The scientific discussion includes arguments that the GTAP model in particular, has been shown to yield results that underestimate ILUC impacts under many sets of inputs. The U.S. EPA found GTAP estimates, especially for lipid-based biofuels (such as biodiesel and renewable diesel), to be at the low end of the range of estimates they found from several ILUC models. We will discuss the implications of overestimation and underestimation of ILUC emissions later in this section.

ILUC modeling is a continually evolving field, due to changes in methods as well as on the ground. A wide range of economic, ecological, and social forces impact land use decisions and reflecting these in a computational framework is a complex challenge that has not been conclusively solved by researchers, yet. The inter-model comparison exercise conducted by the U.S. EPA showed that even though estimates of ILUC impact for a given feedstock/fuel combination could vary widely (as they did with soybean oil biodiesel), multiple models and modeling frameworks can coalesce around a relatively smaller range of estimates (as they did with corn ethanol) as well. It is entirely appropriate to set robust standards for analytical rigor and to ensure that results from different models are comparable in a regulatory environment. Limiting to any single modeling framework (including a pair of models as in the GTAP and AEZ-EF case) may overly restrict the set of tools CARB or other stakeholders could use to address this challenge. This is especially problematic when the limitation forces the use of a model (GTAP) that has undergone critique and shown a tendency towards underestimation of ILUC impacts, especially given the intent (expressed via the definition of “conservative”) is clearly to lean in the opposite direction. (15d3-081.4b)

> **Agency Response:** No changes were made in response to these comments. The subsection 95488.3(d)(2) reference to “being based on the same modeling framework specified in subsection 95488.3(d)(1)” means a conceptual or methodological approach using similar empirical data sources and methodological approaches as that used in subsection 95488.3(d)(1). For the purposes of calculating LUC, the “modeling framework specified in subsection 95488.3(d)(1)” consists of two main components: (1) an estimate of the area and types of land cover conversions associated with increased biofuel demand, and (2) an estimate of the carbon emissions (using emissions factors from the AEZ-EF model) associated with those land cover conversions which allow for individual assessments for specific biomass in a region.

H-4 Multiple Comments: *Scope of Empirical Satellite Data*

Comment: ***Clarifying Appropriate Scope of Underlying Data***: CARB has endeavored to define certain terms that OAL determined were vague, such as “satellite-based empirical estimates of land cover change” and “empirical data on biomass feedstock yields.” However, these revisions do not provide further clarity on which estimates, datasets, and peer-reviewed research articles or reports the Executive Officer would utilize in making a LUC determination. There is significant debate in the scientific community about the proper methods of measuring land use change in general, and as related to renewable fuels programs in particular. As such, the EO must have clear guidance on what resources to utilize. WSPA urges CARB to rely on the most recently available data in making LUC determinations. In addition, WSPA urges

CARB to allow for stakeholder feedback on these resources by making information the EO is proposing to rely upon publicly available and providing for a public notice and comment period. This approach would better align with CARB's typical process for soliciting feedback on data informing its various assumptions about fuels, feedstocks, and pathway applications. (15d3-038.14)

Comment: LUC values for the main U.S.-produced biofuels (i.e., corn ethanol and soy biomass-based diesel) are already provided in Table 6 and would not be subject to this approach. Otherwise, for biofuels produced in countries where adequate datasets are not available from the government, the proposed approach might be appropriate. However, for countries with robust statistical reporting systems on agriculture and land use, CARB should consider such data alongside satellite-based data when developing its estimates. It has been shown that satellite imagery is not well-suited to differentiating between certain types of vegetation (e.g., grassland) and that it can have varying accuracy; additionally, quality has evolved over time, making older imagery less suitable for comparison to more recent imagery. CARB should keep these limitations in mind when using satellite-based data.

Separately, it is RFA's understanding that over the next year CARB intends to initiate a review of its indirect land use change (ILUC) estimates, which are a decade old. RFA agrees that the estimates need to be updated, given the consensus among researchers that potential ILUC is significantly lower than was estimated in the early years of the LCFS, and RFA looks forward to engaging with CARB staff during this process. (15d3-074.2)

> **Agency Response:** No changes were made in response to these comments. As specified by the modified regulatory text of subsection 95488.3(d)(2), for empirical LUC assessment CARB will consider data sources that can attribute land conversions to specific crops in specific locations, which is most commonly referenced using satellite data. There is a strong evidence base for satellite-based land cover monitoring and using satellite data to detect and measure land conversions. In subsection 95488.3(d)(2) as modified released with the Third 15-day Notice, staff have provided a description of the types of datasets that can be used, including several current examples. It is impractical to provide further details on all the potential datasets, research articles, and/or reports used for this analysis, as the geographic scale or scope of these resources can vary considerably by region of focus.
>
> With respect to stakeholder feedback and public notice of staff's empirical LUC estimates, CARB will include the empirical LUC analysis and relevant data sources in the public posting materials for Tier 2 pathways, as mentioned in Agency Response AA-3 in Appendix B of the FSOR: "*Under the public posting requirements of Tier 2 pathways, empirical LUC analyses conducted for such an application will be included in fuel pathway application materials posted for public review and comment prior to CARB certification."*
>
> See response H-2 with regard to direction from Board Resolution 24-14 for an upcoming public forum on LUC values.

H-5 Multiple Comments: *Public Oversight of Empirical LUC Mechanism*

Comment: ***Public Oversight Mechanism***: OAL's disapproval expressed concern that CARB did not address several comments related to the LUC revisions, including CARB's failure to provide a mechanism for public oversight and involvement. Rather than address this concern, CARB's proposed revisions have only further solidified the sole discretion in the hands of the EO. (15d3-038.15)

Comment: CARB should evaluate further revisions to its Land Use Change provisions to account for OAL concerns and to provide for stakeholder feedback (15d3-038.5)

> **Agency Response:** No changes were made in response to these comments. As indicated in response AA-3 in Appendix B of the FSOR, CARB will work with fuel pathway applicants to utilize empirical LUC data to produce empirical estimates that will be used in lieu of the GTAP-estimated land requirements. With respect to stakeholder feedback and public notice of staff's empirical LUC estimates, staff will include the empirical LUC analysis and relevant data sources for public comment in the posting materials for Tier 2 pathways, as described in response AA-3 in Appendix B of the FSOR: "*Under the public posting requirements of Tier 2 pathways, empirical LUC analyses conducted for such an application will be included in fuel pathway application materials posted for public review and comment prior to CARB certification."*

H-6 Multiple Comments: *Calculating Conservative LUC Values*

Comment: ***Novel Pathways***: WSPA members are concerned by the language in §95488.3(d), which now states that the Executive Officer "shall calculate a conservative LUC value" for pathways not represented in Table 6. Applying a conservative LUC factor for novel pathways without any stated cap or percentage in addition to the calculated score may lead to inaccurate or unrepresentative LUC determinations for these pathways. Additionally, CARB's proposed revisions remove any ability for the fuel applicant to participate or provide feedback in determining LUC scores. WSPA recommends that CARB clarify what a conservative LUC score would be relative to a non-conservative score to ensure there is not an excessive CI burden placed on novel pathways. In addition, WSPA requests that the biomass sustainability requirements guidance document be updated shortly following publication of the final LCFS regulation to clarify the iterative relationship between CARB staff and novel fuel pathway applicants to ensure that a fair and accurate LUC calculation process is undertaken. (15d3-038.16)

Comment: These changes recognize a clear and important problem that needs to be addressed in order to allow the LCFS to continue to effectively support the decarbonization of transportation fuels. Land use change (LUC), especially market-mediated land use change (known as indirect land use change or ILUC) associated with biofuels can cause significant GHG impacts; ignoring or underestimating these impacts increases the risk that fuels' actual GHG impacts will exceed their assessed CI score. In some cases, per-gallon GHG impacts of ILUC can be quite large, potentially higher than the carbon intensity score of the fuel itself or the petroleum equivalent it seeks to displace. Given that CARB has received LCFS credit pathway applications for fuels using feedstocks not reflected in Table 6, it is important to establish alternative protocols for evaluating their GHG impacts, including ILUC. The proposed language presented in the 3rd 15 day package makes steps in this direction. However, it leaves some significant areas of uncertainty and creates a potentially severe risk of inaccurate ILUC assessment. We identify three areas of particular concern - applicability of the definition of "conservative" used elsewhere in the LCFS, lack of clarity regarding the term "modeling framework," and overreliance on satellite imagery; we will discuss each of these in turn.

First, it is unclear what is meant by "conservative" as it is used in § 95488.3 (d) (2). The term is generally defined in § 95481 as "reducing the estimated GHG reduction benefits of an operation or utilizing methods and factors that over-estimate energy usage or carbon intensity (90th percentile or highest value)" however, it's not clear how this would be operationalized in the context of ILUC assessment. The conceptual basis for this guidance - to choose estimates that typically imply higher assessed CI scores - is clear and appropriate, given the asymmetric

risk dynamics around ILUC estimation. A preference for overestimation rather than underestimation of ILUC provides greater protection against stranded assets or significant and functionally irreversible (on time scales relevant to addressing climate change) GHG emissions.

While the idea of using the 90th percentile estimate is conceptually clear, it is difficult to operationalize in the context of ILUC modeling, however. The problem is that there is no way to directly sense or measure the ILUC impact of a given fuel+feedstock combination. Any assessment of ILUC is, by necessity, a modeled estimate and therefore based on a set of modeling and analytic assumptions, subject to the limitations imposed by the modeling framework and analytic tools. Quantitative empirical data are measurable, and so long as the measurement instrument is free from systematic bias, a set of measurements could describe underlying characteristics of interest given enough measurements. The statistical tools we have for assessing the validity and representativeness of a sample are often predicated on independent and unbiased measurement error terms. When this is the case, the range of potential outcomes and the distribution of outcomes can be assessed, which allows the identification of a 90th percentile outcome: it is explicitly defined via mathematical formulae. This distinctly contrasts with the modeling tools used to assess ILUC, for which the range of potential outcomes and distribution of results within that range is dependent on the model and input parameters being used. Models are unlikely to have unbiased, independent error terms because the assumptions made to allow a given model to function are likely to bias modeled results towards a certain outcome. This means that the 90th percentile standard articulated in the definition of “conservative” cannot assure a reasonable chance of accuracy for modeled results in the same way that it can when applied to measurements or empirical data. The 90th percentile outcome, *as identified by any given model*, may be below the actual impact (if such could be conclusively determined). More plausibly, the 90th percentile outcome according to one model may be below the 1st percentile outcome of a different model that is based on equally credible assumptions or methodology. There is no empirical measurement of net outcomes possible to calibrate such models, so the range of outcomes can be quite large, as found in the US EPA model comparison analysis. Given that some studies have found that the GTAP model underestimates land use change impacts from biofuels under plausible real-world conditions, even a 90th percentile outcome from a set of GTAP-AEZ modeling that used randomized sets of plausible input parameters could substantially underestimate actual GHG impacts from biofuels. (15d3-081.4a)

> **Agency Response:** No changes were made in response to these comments. Consistent with the applicable definition in section 95481, “conservative” here means that if there are multiple scientifically accurate and/or regionally relevant sources of data available, the one that results in the most conservative (“utilizing methods and factors that over-estimate energy usage or carbon intensity”) LUC value will be used.
>
> With respect to stakeholder feedback and public notice of staff’s empirical LUC estimates, staff will work with the applicant to leverage empirical LUC data to produce empirical estimates, as indicated in response AA-3 in Appendix B of the FSOR. Furthermore, staff will include the empirical LUC analysis and relevant data sources for public comment in the posting materials for Tier 2 pathways, as described in response AA-3 in Appendix B of the FSOR: “*Under the public posting requirements of Tier 2 pathways, empirical LUC analyses conducted for such an application will be included in fuel pathway application materials posted for public review and comment prior to CARB certification.”*

H-7 Multiple Comments: *Administrative Process*

Comment: ***Scope of Determinations***: CARB's proposed revisions do not specify whether the new LUC value established by the EO would be specific to an individual fuel pathway applicant or if it would be added to the table such that other fuel pathway applicants may take advantage of the new LUC value, should it meet their needs. WSPA is concerned that this lack of clarity will cause future implementation challenges. (15d3-038.17)

> **Agency Response:** No changes were made in response to this comment. As specified in subsection 95488.3(d)(2) as modified, empirical LUC values are assigned to fuel pathways.

Comment: ***Timing of Determinations***: Given the complexity of calculating LUC scores, there is a real concern that there may be an excessive delay to arrive at a LUC determination. WSPA recommends that CARB include a timing component to the LUC calculations. (15d3-038.18)

> **Agency Response:** No changes were made in response to this comment. Staff do not expect the empirical LUC assessment to cause excessive delays in the overall pathway certification process. Staff will work with the applicant during the review process to ensure that a LUC value is calculated pursuant to the regulatory requirements and in a timely manner.

Comment: Neste is concerned by the changes to section 95488.3(d)(1) that now seem to make LUC evaluations apply to all biomass-feedstocks and not just to crop-based feedstocks. This is a new change that is outside the scope of the concerns raised by OAL, as OAL's only issue was that section 95488.3(d)(2) did not state the methodologies that will be used to evaluate LUC. This proposed change to 95488.3(d)(1) also goes against all scientific research regarding LUC, including CARB's own 2015 research, that have all concluded that only crop-based feedstocks result in LUC. Neste therefore recommends that CARB remove its proposed change to 95488.3(d) as it pertains to which feedstocks are subject to LUC evaluations. (15d3-039.16)

> **Agency Response:** No changes were made in response to this comment. The clarifications on calculating and assigning LUC values are responsive to item 1.1 in OAL's Decision of Disapproval. Inclusion of the word "biomass" in this section improves clarity and consistency with the types of biomass subject to sustainability requirements in section 95488.9(g), which include process fuel biomass that can present the same sustainability concerns as crop feedstocks. Although the LCFS regulation does not define "feedstock," referencing the definition for "biomass" improves regulatory clarity.

Comment: To further support certainty for fuel pathway applicants, NOPA encourages CARB to clarify that the Canola Biomass-Based Diesel value in Table 6 is for "Spring Canola Biomass-Based Diesel." Argonne National Lab (ANL) recently qualified the canola included in its *2024 R&D GREET Model*, which also references the 2024 Carbon Calculator for Land Use and Land Management Change from Biofuels Production (CCLUB), as "Spring Canola." NOPA urges CARB to adopt consistent terminology. (15d3-052.4)

> **Agency Response:** No changes were made in response to this comment. CARB will review the regulatory treatment of biomass produced under different crop cycles as part of application review.

I Sustainability Requirements

I-1 *Provide an Updated Transition Schedule*

Comment: Sustainability Criteria: The sustainability criteria are benchmarked upon a still-unknown effective date. WSPA recommends that compliance with these provisions be delayed by six months or one full calendar year to account for the delay caused by OAL's disapproval, given that the window to prepare for such changes has been significantly shortened. Furthermore, WSPA recommends that CARB explicitly clarify that the new attestation requirements are only effective once the amended regulation is made effective by OAL. WSPA urges CARB to delay the effective date for these requirements to January 1, 2026, to avoid compliance risk and to allow sufficient time for regulated entities to complete these verifications, given the significant burden associated with reviewing performance under two different sets of procedures. Section 95488.9(g)(5)(C)(1) clarifies that fuel pathway applicants, in addition to fuel pathway holders, must maintain attestation letters certifying compliance with the revised sustainability requirements. Under the current provision, pathway applicants would essentially be required to immediately demonstrate compliance based on the delays in finalizing the program revisions, even though CARB has not currently issued any implementation guidance. The attestation requirements will require substantial time to implement – which CARB acknowledges by giving pathway holders until January 1, 2026 – and pathway applicants should not be required to maintain attestation letters any earlier than fuel pathway holders. (15d3-038.10)

Comment: Compounding matters, CARB's lengthy rulemaking process, which remains incomplete, has compressed the time period for compliance with the Proposed Amendments, which still feature implementation deadlines starting in January 2026. This leaves biofuel producers facing new and uncertain feedstock certification requirements applicable within mere months of the effective date of the regulations, should OAL now approve them.

POET again urges CARB to refrain from adopting its proposed sustainability requirements and to instead address the issue of feedstock sustainability in a future rulemaking. In the alternative, POET urges CARB to clarify the standards it intends to impose and to postpone the proposed implementation dates for feedstock sustainability requirements. (15d3-040.2)

Comment: *CARB Should Postpone the Implementation Dates for Feedstock Sustainability Requirements* Given the protracted length of this rulemaking, which began with proposed new regulatory language in December 2023, and the delays occasioned by OAL's February 18, 2025 rejection of CARB's Proposed Amendments, CARB should postpone the implementation dates for feedstock sustainability requirements which are currently slated to begin in 2026, leaving stakeholders mere months to prepare for compliance with new and ambiguously defined rules that represent a complex and onerous paradigm shift in California's LCFS program. (15d3-040.5)

Comment: At a Minimum, CARB Must Adjust the Effective Date of the Crop Requirements to Account for the Delay in OAL Approval. The Crop Requirements become applicable as early as the effective date of the Amendments for some producers and, at the latest, 2026 for others. This timeline was already highly burdensome to the regulated community as the requirements place substantial new requirements on feedstock and biofuels producers, which will take significant time to implement (if they can feasibly be implemented at all). Now, OAL's disapproval and CARB's resubmission of the Amendments has further abbreviated the period between finalization of the requirements and their effective date. It would be arbitrary and capricious for CARB to maintain the original compliance deadlines in light of the regulatory

delay and the substantial changes that biofuels producers would need to make to come into compliance with these new requirements, including purchasing and installing new equipment, negotiating contracts with new suppliers, and for some biomass suppliers altering (or rendering obsolete) the fundamental structure of their business models. At a minimum, CARB must delay the effective date and "first milestone" requirements until January 1, 2027, and the later stages currently set for 2028 and 2031 should be delayed accordingly. (15d3-069.8)

Comment: Sustainability Criteria: The sustainability criteria are benchmarked upon a still -unknown effective date. WSPA recommends that compliance with these provisions be delayed by six months or one full calendar year to account for the delay caused by OAL's disapproval, given that the window to prepare for such changes has been significantly shortened. Furthermore, WSPA recommends that CARB explicitly clarify that the new attestation requirements are only effective once the amended regulation is made effective by OAL. WSPA urges CARB to delay the effective date for these requirements to January 1, 2026, to avoid compliance risk and to allow sufficient time for regulated entities to complete these verifications, given the significant burden associated with reviewing performance under two different sets of procedures. Section 95488.9(g)(5)(C)(1) clarifies that fuel pathway applicants, in addition to fuel pathway holders, must maintain attestation letters certifying compliance with the revised sustainability requirements. Under the current provision, pathway applicants would essentially be required to immediately demonstrate compliance based on the delays in finalizing the program revisions, even though CARB has not currently issued any implementation guidance. The attestation requirements will require substantial time to implement – which CARB acknowledges by giving pathway holders until January 1, 2026 – and pathway applicants should not be required to maintain attestation letters any earlier than fuel pathway holders. (15d3-038.10)

> **Agency Response:** No changes were made in response to these comments. The changes made to subsection 95488.9(g)(5)(C)1. are responsive to item 1.21 in OAL's Decision of Disapproval. Because the subsection 95488.9(g) sustainability requirements have a delayed implementation phase-in beginning in 2026 (reported in 2027), short term delays to the effective date of the amendments will not impact fuel producers' ability to meet those requirements.
>
> For fuel pathway holders, the referenced attestation requirements and submission of geographical shapefiles or coordinates of plot boundaries begins with the 2026 data year reported in the 2026 AFPR (annual Fuel Pathway Report), which is submitted in 2027. These regulatory changes were initially noticed in Fall 2024 and approved by the CARB Board at the November 8, 2024 hearing, providing ample lead time to prepare for biomass attestation requirements, for which data collection would begin January 1, 2026. Attestation requirements for new pathway applicants are required as of the effective date of the amendments.

I-2 Multiple Comments: *Oppose Sustainability Requirements*

Comment: Although we continue to hold and assert the views expressed in our prior comments, we write separately here to address specific legal and administrative problems presented by the breadth and ambiguity of CARB's "sustainability" related amendments, which suffer from the same defects identified by the State of California's Office of Administrative Law ("OAL") in its Decision of Disapproval of Regulatory Action dated February 25, 2025 ("Disapproval Decision"). In its Disapproval Decision, OAL determined that CARB had violated the California Administrative Procedure Act's clarity standard in several respects. OAL explained that "the meaning of regulations [must] be easily understood by those persons

directly affected by them," and directed CARB to correct twenty-six instances in which the Proposed Amendments failed to meet this requirement. Although CARB has now acted to address the specific issues named in the Disapproval Decision, the agency has left in place fundamentally ambiguous language at the heart of its proposed "Sustainability Requirements," creating costly risks and uncertainties for "directly affected" stakeholders like POET. (15d3-040.1)

Comment: *CARB Should Eliminate the Impermissibly Vague Requirement That "Biomass Must Be Cultivated and Harvested in Accordance with All Local, State, and Federal Rules and Permits."* Beginning in 2026, CARB's Sustainability Requirements for biomass-based fuel pathways require an attestation from biofuel producers guaranteeing that the feedstocks used to produce their fuel were "cultivated and harvested in accordance with all local, State, and federal rules and permits." On its face, the scope of this attestation is incredibly broad and could be construed to mean that biofuel producers must guarantee to CARB that the farmers who grow their feedstocks have not deviated from any law in any way. A requirement of that breadth and reach is not rationally related to CARB's intended goal of ensuring that biofuel feedstocks are grown sustainably. Furthermore, it is impossible to know what type of due diligence activities CARB expects biofuel producers to engage in to determine whether the farmers from whom they source their feedstocks have followed "all local, State, and federal rules and permits" that may apply to the seeds, fertilizers, labor, equipment, fuel, and other supplies and activities required to cultivate and harvest their crops. Without knowing what specific legal requirements CARB has in mind, and without knowing whether and to what extent CARB intends to require on-farm compliance audits, the meaning of CARB's regulatory language is not "easily understood" and therefore fails to comply with the California APA's clarity standard. (15d3-040.3)

Comment: *CARB Should Clarify or Eliminate the Impermissibly Vague Requirement that Biomass-Based Feedstocks Be Produced Under the "Best Environmental Management Practices"* Beginning in 2028, biofuel producers are required to source feedstocks "produced according to best environmental management practices that reduce GHG emissions or increase GHG sequestration." But CARB does not clearly define this requirement. Despite feedback from various stakeholders across multiple rounds of comments that the term "best environmental management practices" is too vague and does not allow biofuel producers to understand and plan for compliance, the Third Revised Proposed Amendments continue to offer only examples of such practices, and not a clear set of rules. And those examples, which "include but are not limited to" "[m]aintain[ing] or enhance[ing] biodiversity habitat on agricultural or forested lands," "[e]nhanc[ing] soil fertility and avoid[ing] erosion or compaction," "[a]pply[ing] fertilizers in a manner that minimizes runoff, and soil and water contamination," and [r]educ[ing] unsustainable water use, and minimize[ing] diffuse and localized pollution from chemical residues, fertilizers, soil erosion, or other sources of ground and surface water contamination,"6 are themselves too vague to offer clear guidance regarding how those "directly affected" by the regulation are obliged to follow it. This language too, therefore, fails the California APA's clarity standard. (15d3-040.4)

Comment: The Crop Requirements are replete with provisions that are not easily understood, are susceptible to multiple meanings, and are not defined in regulation or statute. OAL's disapproval notice cites five separate provisions within the Crop Requirements at § 95488.9(g) that fail to meet regulatory standards for clarity. OAL's concerns with these specific provisions are well-founded, but they are the tip of the iceberg. In particular, there are three key areas where the Amendments' lack of clarity renders the Crop Requirements arbitrary and capricious and unconstitutionally vague: (1) the best environmental management practices ("BEMPs") in

§ 95488.9(g)(3), (2) the third-party certification system criteria in § 95488.9(g)(8), and (3) sweeping compliance with-all-laws obligations that would require producers to monitor and attest to farmers' actions' consistency with "all local, State, and federal rules and permits" in § 95488.9(g)(1-2).

First, the BEMPs requirements in Section 95488.9(g)(3) consist of vague goals disconnected from any actionable targets or approaches producers could implement. For example, the Amendments state that cropland on which biofuels used in the LCFS program are grown, whether in Iowa or Kansas or Brazil, must "[m]aintain or enhance biodiversity habitat on agricultural or forested lands," "[e]nhance soil fertility and avoid erosion or compaction," and "reduce unsustainable water use. . . ." 17 C.C.R. § 95488.9(g)(3). None of these terms are explained, defined, or otherwise expressed in a way that can be "easily understood" for producers to implement. It is impossible for producers to know what farming practices CARB will determine "enhance biodiversity," how one can demonstrate that their farms "avoid erosion," or what types of water use CARB will deem "unsustainable." Yet failure to comply with the BEMPs will result in ineligibility of feedstock for use in biofuel production separate and apart from whether the feedstock meets a third-party certifier's requirements. Id. § 95488.9(g)(4).

Second, the third-party certification system criteria are so nebulous that CARB preserves unfettered discretion over what certification systems will be approved or denied. Other than European certification systems, which CARB has bound itself to approve irrespective of consistency with U.S. or California law, CARB has set such vague criteria that it is impossible for regulated parties to anticipate what certification systems will be approved or denied, and regulated parties have no voice in the approval process. For example, certification systems must "consider environmental, social, and economic criteria"—a category so broad that it is difficult to imagine anything that CARB would not be able to use as a basis for declining to approve a certification system. § 95488.9(g)(8)(A)(2). The Amendments also require "sanction mechanisms" for farmers without any indication of what types of sanctions are appropriate, and mandate "an effective grievance mechanism" without any description of how CARB will determine effectiveness. § 95488.9(g)(8)(A)(11-12).

In the context of this pervasive lack of clarity, CARB's cosmetic changes to the regulations in this 15-Day proposal are legally insufficient. OAL correctly rejected §§ 95488.9(g)(6)(C)(2), 95488.9(g)(7)(C)(1), and 95488.9(g)(8)(A) on the grounds that it was "unclear when the Executive Officer will choose not to approve a certification system." In the 15-Day proposal, CARB adjusts these provisions to state that CARB "shall" rather than "may" adopt certification systems that satisfy the criteria listed in § 95488.9(g). But, despite numerous requests from Growth Energy and others to elaborate this critical aspect of the Crop Requirements, CARB has done nothing to add clarity to the criteria. Regulated parties remain in the dark as to what practices the BEMPs require and which "social" criteria farmers in Iowa or elsewhere must adhere to in order to sell crops to biofuels producers.

Similarly, OAL correctly rejected § 95488.9(g)(8)(H) because, among other reasons, it was "unclear when the Executive Officer will remove, suspend, or otherwise modify approval of an approved certification system." The language at issue included that "the Executive Officer may also remove, suspend or modify approval of an approved certification system if appropriate for consistency with a modification, removal, or suspension of the certification system standard in an analogous GHG program." § 95488.9(g)(8)(I). CARB's changes in the 15-Day proposal change the term "may…if appropriate" to "shall…if appropriate." Id. Any clarity provided by the use of "shall" in this provision is undermined by the retention of the qualifier "if appropriate."

CARB retains full discretion to determine whether it is “appropriate” to remove, suspend, or modify approval of the certification system. As such, CARB’s use of “shall” fails to improve the clarity of the rejected regulatory provision.

Third, the Amendments require biofuels producers to ensure farmers’ consistency with—and attest under penalty of perjury to—sweeping compliance-with-all laws statements despite not having first-hand knowledge of the information to which they are attesting. Of particular concern, the Amendments require biofuel producers to testify under penalty of perjury that crops were harvested “in accordance with all local, State, and federal rules and permits.” § 95488.9(g)(1)(B)(1)(e)(emphasis added); § 95488.9(g)(2). The sheer breadth of this language makes it unclear how a biofuel producer could ever ensure compliance. It is unclear how biofuels producers should go about identifying all local, State, and federal rules and permits applicable to a particular farmer, let alone determining whether the farmer has complied with such rules and permits. Nor is it reasonable for a biofuel producer to ask farmers to make such sweeping and unqualified statements of compliance. (15d3-069.3)

> **Agency Response:** No changes were made in response to these comments. The clarification on the criteria under which the EO may modify approval for a certification system is responsive to item 1.9 in OAL's Decision of Disapproval. Other topics raised by commenter are beyond the scope of the modifications described in and released with the Third 15-day Notice. See Agency Response DD-3 in FSOR Appendix B for further information responsive to these comments.

I-3 *Proposed Sustainability Certification Systems*

Comment: NOPA strongly supports the continued mention of Canada’s Clean Fuel Regulations (CFR) in the Third 15-Day Package and urges CARB to formally recognize the CFR as an “Approved Certification System” in the final rule. Mutual recognition of robust, government-administered programs—such as the CFR and the U.S. Renewable Fuel Standard (RFS)—would streamline compliance and promote alignment across major jurisdictions. These programs already incorporate thorough sustainability verification processes for crop-based feedstocks and would help CARB achieve its environmental goals without duplicating effort or creating unnecessary barriers. (15d3-052.1)

> **Agency Response:** No changes were made in response to this comment. This topic is beyond the scope of the modifications described in and released with the Third 15-Day Notice.

I-4 Multiple comments: *Modification, Suspension, and Removal Protocol for Sustainability Certification Systems*

Comment: *Stakeholders Should Be Notified of Certification System Modification, Revocation, or Approval.* Section 95488.9(g)(8)(K) states that affected certification systems will be notified within seven days of modification, revocation, or approval. WSPA requests that regulated entities are also notified of changes to a certification system’s status within a timely manner. (15d3-038.22)

Comment: Proposed changes to this section establish a protocol for responding to changes in practices by a certification body that may mean it no longer meets the requirements for certification under the LCFS. Where a body no longer meets one specification in § 95488.9 (g) (8) (A), the proposed changes allow an opportunity for the certifying body to reestablish compliance. This appears to be intended to give certification systems the opportunity to return to compliance without disrupting their operations or the pathways that rely upon them. If non-

compliance with one specification in § 95488.9 (g) (8) (A) does not create a risk that fuels consumed in California would exceed their pathway CI scores, then allowing an opportunity to rectify the error and return to full compliance can help reduce compliance costs and administrative burden. Not all violations of the criteria specified in § 95488.9 (g) (8) (A) are innocuous, however. If the specific violation significantly impacts the assessment of the fuel in question's CI score, then allowing continued operation of the certification body may result in actual emissions that significantly exceed documented levels and appropriate LCFS credit revenue. In cases where companies continue to function despite no longer complying with one criterion in § 95488.9 (g) (8) (A), the Executive Officer may need the authority to determine whether CI scores from the entity appropriately reflect actual emissions from their respective fuels, and if not, appropriate corrective action must be taken to ensure that intentional non-compliance and use of the grace period offered under these proposed changes do not become a tactic to allow favorable, but inaccurate CI scores to generate credit. (15d3-081.6)

Comment: Sustainability Certification System Approval/Disapproval (95488.9(g)): Neste appreciates CARB adding clarity as to how sustainability certification systems will be approved for use. Should a certification system be disapproved, Neste appreciates knowing how that will be managed. (15d3-039.8)

> **Agency Response:** No changes were made in response to these comments. The clarification on the criteria under which the EO may modify approval for a certification system is responsive to item 1.9 in OAL's Decision of Disapproval. CARB will ensure adequate notice for affected stakeholders of changes in certification status consistent with proposed regulatory requirements that CARB publish approved certification systems (subsection 95488.9(g)(8)(E)) and remove revoked certifications (subsection 95488.9(g)(8)(I)).
>
> Regarding potential implications of modification, suspension, or removal of sustainability certification, the purpose of the Sustainability Certification requirements is not to capture detailed changes in a fuel pathway's carbon intensity. The LCFS regulation has separate provisions to capture these changes. The LCFS regulation requires annual fuel pathway reporting and verification that are designed to ensure that any changes in the carbon intensity of a fuel pathway are ultimately captured and reflected in the credits generated under the pathway.

I-5 Multiple Comments: *Necessity of Sustainability Requirements for Ethanol Producers*

Comment: OAL Should Also Disapprove The Crop Requirements as Applicable to U.S. Ethanol Producers For Failing to Satisfy the Necessity Standard.

In addition to needing sufficient clarity, California regulations must be shown to be "reasonably necessary to carry out the purpose and address the problem for which it is proposed." Cal. Gov. Code § 11346.2(b). This necessity standard requires both a "statement of the specific purpose of each adoption, amendment, or repeal;" and "information explaining why each provision of the adopted regulation is required to carry out the described purpose of the provision." 1 C.C.R. § 10.

CARB has failed to demonstrate that the Crop Requirements on ethanol producers are reasonably necessary. CARB claims that the Crop Requirements are intended to address increased crop demand from a "rapid expansion of biofuel production and biofuel demand." Yet CARB does not project any "rapid expansion" in ethanol demand; and instead notes the

opposite, that "ethanol volumes are expected to decrease over the course of the Proposed Amendments. The only feedstock crops for which CARB has asserted that an increase in crop demand may occur are oil crops, used to produce biodiesel or renewable diesel. As Growth Energy and others have previously explained, oil crops are not used to produce ethanol.

> CARB's response to comments on this issue is inapposite. It states:
>
> *By targeting or singling out specific biomass types, the risk increases for biomass not subject to sustainability requirements, as fuel producers shift to less stringent sources. All biomass-based fuels. . . are subject to the same sustainability criteria to minimize any incentive to shift to biomass sources with less stringent requirements.*

This reasoning misses fundamental realities of the fuels market: ethanol is blended into gasoline, not diesel, and gasoline and diesel are not substitutes. As documented in the record, gasoline demand and diesel demand are on two different trajectories in California given different engine mixes. CARB is incorrect to assert that placing constraints on feedstocks for biodiesel and renewable diesel would spur demand for corn used for ethanol when the fuels are not interchangeable.

Moreover, CARB already disproportionately disincentivizes the use of ethanol through an "indirect land use change" penalty that is roughly four times higher than recent values published by the U.S. Department of Energy. Additional disincentives for ethanol are unreasonable and unnecessary, especially where CARB has not identified any current or expected increase to ethanol demand in California. OAL should therefore disapprove of the Crop Requirements as applied to ethanol producers. (15d3-069.9)

Comment: The Sustainability Requirements in Section 95488.9(g) are Unnecessary for U.S.-Produced Ethanol and Are Unworkable

CARB's stated rationale for including sustainability requirements in the LCFS amendments was concern about a "rapid expansion of biofuel production and biofuel feedstock demand [that] could result in deforestation or adverse land use change…" However, RFA has repeatedly substantiated in our comments that U.S. corn ethanol is not undergoing rapid expansion and, therefore, the sustainability requirements in section 95488.9(g) should not apply to it. Additionally, RFA has detailed in its previous comments that the sustainability requirements are burdensome and potentially unworkable. Yet, CARB continues to be completely unresponsive to this logic and evidence. To date, CARB has still not substantiated the need for, or demonstrated the benefit of, the sustainability requirements that it finalized in Section 95488.9. We would urge CARB to review and carefully consider RFA's comments submitted in response to the workshop held on April 10, 2024, in addition to the comments noted above on the First and Second 15-day Changes. In addition, RFA is attaching an analysis showing that the amount of cropland used to produce ethanol consumed in California has fallen more than 20 percent since 2011. The analysis shows that the number corn acres needed to meet California ethanol demand has decreased by more than 700,000 acres since the LCFS program began. The empirical data presented in the analysis clearly invalidate CARB's rationale for implementing the additional sustainability provisions at Section 95488.9(g). (15d3-074.3)

> **Agency Response:** No changes were made in response to these comments, which are beyond the scope of the Third 15-Day modifications. CARB staff stand by the rationale for the amendment concept at issue as justified by the rulemaking record. Specifically, Agency Response DD-2 in FSOR Appendix B noted:

"While feedstocks produced in the US and Canada may be at lower direct risk for deforestation compared to international feedstocks, there is still a risk of conversion of other carbon-rich ecosystems like native prairie and wetlands that third-party certification can protect against."

I-6 *Compliance Cost Estimates were Withheld Until After the Comment Periods were Concluded*

Comment: First, as a threshold matter, CARB's presentation of these compliance cost estimates is inconsistent with California procedural requirements. California agencies "shall include" in the Initial Statement of Reasons "[a]n identification of each technical, theoretical, and empirical study, report, or similar document, if any, upon which the agency relies in proposing the adoption, amendment, or repeal of a regulation." Cal. Gov. Code 11346.2(b)(3). Yet CARB withheld its $39,000 per company compliance cost estimate until after the comment period had concluded, finally releasing the figure in an appendix to the FSOR. And even the FSOR provides no explanation of the estimate's origin. CARB's procedural errors here deprived the public of any opportunity to provide technical information to refute this estimate. Indeed, the California notice and comment procedural protections exist for this very purpose—to allow the public to present information to correct flawed agency assumptions before those assumptions become codified into flawed regulations.[10] As such, we urge CARB to correct its error by disclosing and accepting comment on whatever technical basis CARB relied upon in this rulemaking to support its compliance cost estimates and assumptions.

Second, with respect to estimated costs, $39,000/company per year is a gross underestimate which underscores CARB's lack of understanding of the impacts of the Amendments on biofuels producers. Had CARB presented this estimate to regulated parties during the rulemaking process and explained how it was derived, the Board could have considered in its vote on the package a more realistic picture of the changes wrought by the Crop Requirements and their burden on industry as compared against the illusory benefits.

As explained further in the attached letter by environmental economists at Optima Analytics, regulated parties are likely to incur at least the following categories of costs to come into compliance with the Crop Requirements, each of which is likely to independently exceed $39,000 per company:

- Audit costs to verify farmers' compliance with all federal, state, and local laws.
- Additional personnel necessary at biofuels producers to ensure that feedstock is sourced from verified farmers and that all local, state, and federal regulations are being followed.
- Additional personnel necessary at grain elevators to oversee deliveries, track grain, and ensure that feedstock separation is maintained.
- Biofuel producers' direct costs in contracting with third-party certifiers to achieve third-party certification for every farm providing feedstock for the California market.
- Capital expenditures and operational costs for new equipment including silos, bins, and storage buildings at grain elevators to allow physical separation of certified and non-certified feedstock.
- Capital expenditures and operational costs for new equipment including fermentation tanks, stills, heat exchangers, storage bins and buildings, and process control panels and software at biorefineries to allow physical separation of California-destined and other-destination fuels.

- Capital and annual compliance costs incurred by farmers to achieve and maintain certification.
- Increased transportation costs to ensure certified and non-certified feedstocks and fuels are not commingled in trucks or trains.

Some of these costs may be so significant, and may require structural operational changes so fundamental, as to render compliance impossible for certain categories of producers and/or entities in the supply chain. Indeed, costs are also not limited to farmers and biorefineries. As researchers from Iowa State University recently concluded, "current corn and soybean handling, storage, and transportation systems are well suited for commodity management, but are not designed for the segregation and isolation of specialized products. The systems need physical and procedural modifications to effectively handle two grain streams."[11] For certain grain elevators and other suppliers of biomass the Crop Requirements are not simply a matter of compliance costs, but rather are likely to extinguish their business models. Grain elevators are not physically designed or technologically equipped to comply with requirements of identifying, segregating, and tracking fungible kernels of corn. Grain elevators may be forced out of market entirely unless they completely change physical layout, basic operations, and contracting practices. And even if a grain elevator had the capital available to make such substantial changes, the additional cost/bushel to keep grains separated would likely reduce already-slim margins by approximately one-third.[12] As a result, the Amendments will dramatically reshape how biofuels producers procure grain today, to the detriment of wholly out-of-state actors as well as California consumers forced to pay more for the same fuel.[13]

There is no evidence that CARB considered any of these compliance costs or structural changes to the interstate commodities market in promulgating this rule. Without adequate consideration of compliance costs, CARB's assumption that the Crop Requirements will not "reduce or limit the availability of biomass-based feedstocks in the program" is faulty.[14] As detailed in Growth Energy's previous comments, this faulty, unsupported assumption risks extreme adverse impacts to the California transportation fuel market.[15] If significant volumes of credit-generating ethanol are unable to comply and become assigned the carbon intensity of gasoline, Californians can expect the resulting shortage of available LCFS credits to result in a corresponding price increase that will predominately be felt by consumers at the pump.[16]

Finally, CARB greatly overstates the extent to which its implementation timeline defers compliance costs. Biofuels producers must immediately commence work to establish supply chain traceability in order to accurately submit spatial data and attest to the source of feedstock by the fast-approaching deadlines. As detailed above and in the attached expert report, this will require substantial investment to separate currently commingled grain handling, storage, and transportation systems, including but not limited to grain elevators. To be sure, the additional certification requirements arising in 2028 and 2031 will ratchet up compliance costs further. But CARB's extension of the "fully compliant" deadline to 2031 does not alleviate the significant immediate costs necessary to renovate complex agricultural supply chains before CARB's "first milestone" of sourcing and attestation requirements.

In sum, CARB should reconsider the economic implications of the Crop Requirements and provide an updated disclosure for public comment of estimated costs. (15d3-069.4)

> **Agency Response:** No changes were made in response to this comment, which is not directed at any modification included in the Third 15-Day modifications package, does not include a specific recommendation for a change to the rulemaking proposal, and therefore is irrelevant. CARB's analyses of costs associated with the sustainability

amendments concept, as part of the updated final Form 399 and as reflected in the FSOR, satisfy applicable substantive and procedural requirements.[9]

As described in FSOR Appendix B Agency Response DD-3, the sustainability requirements amendment concept shown in the proposed addition of subsection 95488.9(g) evolved during the course of the rulemaking in response to public comments. While completing the FSOR and associated updates to the analyses included in the ISOR and supporting documents, CARB incorporated an estimate of potential compliance costs to regulated entities arising from annual implementation costs for the full sustainability requirements in the final amendment proposal.

As noted in that response DD-3, that estimate of annual implementation costs for the full sustainability requirements of $4.7 million per year for the industry is an average of roughly $39,000 per company based on the number of biofuel producers in 2023.

CARB explained the methodology for that estimate in the update to its economic impact analysis submitted to and approved by the Department of Finance prior to submission of the rulemaking package to OAL. This is staff's cost estimation methodology included in the Final Form 399 Attachment and the final rulemaking file:

> "By 2026, most biofuel producers must attest that the biomass used in their production is sourced from land that was cleared or cultivated prior to January 1, 2008, and actively managed or fallow since January 1, 2008, and provide geographic shapefiles of their property. In 2028, these producers must also maintain continuous third-party sustainability certification, and in 2031, they must receive certification proving use of additional environmental management practices that reduce GHG emissions or increase GHG sequestration. Staff estimate that the 2026 requirement will take one hour per farm at a rate of $88 per hour, that 2028 requirements will take 40 hours per company at $88 per hour plus an annual $15,000 third-party certification cost, and that 2031 requirements will take 30 hours per company at $88 per hour plus an annual $36,200 third-party certification cost. Total costs per year are expected to average $4.7 million."[10]

I-7 Multiple Comments: *Flaws in Cost Estimates Result in Inaccurate Environmental Impact Analysis*

Comment: A supplemental EIR is required if significant new information or substantial changes in the project or surrounding circumstances necessitate major revisions to the EIR. See Moss v. County of Humboldt, 162 Cal.App.4th 1041, 1057 (2008); see also Guidelines,

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[9] Govt. Code, §§ 11346.3 and 11346.36 establish requirements applicable to economic impact analyses for rulemakings under California's Administrative Procedures Act, including requirements to prepare a standardized regulatory impact assessment (SRIA) for major regulations in the manner prescribed by the Department of Finance. Department of Finance (DOF) regulations adopted at title 1, California Code of Regulations, §§ 2000-2003 as directed by Govt. Code, § 11346.36 further specify the economic impact analysis requirements applicable to state regulatory agencies. Those regulations and associated guidelines published in the State Administrative Manual (6600-6616) further specify that the required analysis information from state agencies must be submitted to the Department of Finance using a prescribed form (known as Form 399). An updated Form 399 approved by DOF and related documents must be submitted in the agency's rulemaking file for the proposed action.

[10] California Air Resources Board, *Economic and Fiscal Impact Statement: Final Form 399 Attachment.* 2024.

§ 15164, subd. (a). That is the case here. Major revisions to the EIA are needed to address environmental impacts that were ignored or downplayed in the EIA due to CARB's reliance on a deeply flawed cost estimate as well as recent developments in global trade policy.

Public Resources Code section 21166 requires the preparation of a supplemental environmental impact report in certain circumstances, including, as pertinent here, where "[s]ubstantial changes occur with respect to the circumstances under which the project is being undertaken which will require major revisions in the environmental impact report" or where "[n]ew information, which was not known and could not have been known at the time the environmental impact report was certified as complete becomes available." As explained below, both of these conditions are applicable here. Accordingly, CEQA requires that CARB prepare a supplemental EIA.[22]

…

Significant new information and substantial changes in the circumstances under which the Amendments will be undertaken necessitates major revisions to the EIA. As shown above, CARB's $39,000 per company compliance cost estimate grossly underestimates the cost of complying with the Amendments. However, an accurate estimate of compliance costs is essential to evaluate the Amendments' secondary effects and whether they will result in significant environmental impacts. Because CARB's estimate of compliance costs so drastically underestimates the economic consequences of the Crop Requirements, the EIA ignores or downplays environmental impacts associated with the Amendments' reasonably foreseeable secondary effects, including changes to supply chain dynamics, changes to feedstock demand and availability, and environmental impacts resulting from changes to the mix of fuels consumed in California. For example, the EIA categorically fails to consider the likelihood that the Crop Requirements will strain feedstock availability and disrupt supply chains such that biofuel producers will reduce the volume of biofuel in the California transportation fuel market, resulting in a reasonably foreseeable increase in fossil fuel consumption.

Had CARB disclosed its cost estimate and its basis during the CEQA comment period, such errors could have been identified and corrected before the CARB board approved the Amendments. But this did not occur. Instead, CARB not only deprived the public of the opportunity to review and comment on staff's flawed cost estimate and its effect on the EIA, but also deprived the CARB board of the opportunity to consider public input on these issues before deciding whether to approve the Amendments.

…

Recent global trade developments only increase the likelihood that the Amendments will cause new and more severe environmental impacts than those analyzed in the EIA. According to recent media reports, recent U.S. tariff policy "will severely disrupt global supply chains critical to renewable energy and electric vehicles."[23] In addition, retaliatory tariffs against U.S. crops may reduce global demand for U.S.-grown corn, soy, and other biofuel feedstocks.[24] This combination of disruptions to both the electric vehicle and biofuels supply chains may result in substantial changes to the mix of transportation fuels incentivized by the LCFS program. At a minimum, the extreme economic uncertainty posed by these recent events warrants supplemental analysis.

In light of the above, new information and substantial changes to the circumstances in which the project will be undertaken necessitate major revisions to the EIA. The EIA acknowledges that reasonably foreseeable compliance responses resulting from CARB's adoption of the

Amendments could result in significant impacts to the existing physical environment due to "modifications to cultivation volume and transport of feedstock," "changes to location and types of feedstock," "construction of new facilities to produce renewable [fuels]," "construction of solar and wind electricity generation projects," "modification to existing or new industrial facilities," "construction of new infrastructure," "modifications to electricity distribution and transmission infrastructure," "land use changes," and "changes to fuel-associated shipment patterns," among many other things. Final EIA, p. 43. Nevertheless, CARB's deeply flawed cost estimate conceals the true scope and extent of environmental impacts resulting from these compliance responses—impacts that the current global trade environment will amplify significantly.

CARB cannot simply ignore the obvious potential for new or different environmental impacts due to its flawed estimate of compliance costs and recent developments in global trade policy. These developments will substantially alter the number and extent of the Amendments' environmental impacts and therefore major revisions to the EIA are required to ensure that the public and the CARB board have sufficient information to consider meaningfully the project's environmental impacts before the project is approved. At a minimum, CARB must prepare an addendum to the EIA to document its determination that a supplemental EIA is not required." (15d3-069.5)

Comment: CARB approved the Amendments, and certified the Final EIA on November 8, 2024 with the adoption of Resolution 24-14. However, CARB did not publicize compliance cost estimates and further analysis of environmental impacts until an addendum to the Final Statement of Reasons was released in January. This violates CEQA because the FSOR addendum raises new and significant environmental issues that must be evaluated before the project is approved under CEQA. Such issues cannot be addressed in an addendum to the FSOR after the Amendments and the Final EIA have been approved by the CARB board for purposes of CEQA without reopening the CEQA record. By declining to reopen the CEQA record and instead responding to significant environmental issues in an addendum to the FSOR, CARB is engaging in impermissible post hoc environmental review and depriving the CARB board of important information needed to evaluate whether to approve the Amendments in the manner required by CEQA. To comply with CEQA, CARB must reopen the CEQA record and present all environmental comments and all agency responses to those comments to the CARB board for approval.[25] (15d3-069.6)

> **Agency Response:** No changes were made in response to these comments, which are beyond the scope of the modifications described in the Third 15-Day Notice. The comments are irrelevant because they are not directed at any modification included in the Third 15-Day modifications package, and do not include a specific recommendation for a change to the rulemaking proposal. Because the updates to the cost analyses included in the FSOR that the commenter objects to are not changes to the substantive requirements of the amendments, they do not change implementation of the regulation. Nor do the updates to the cost analysis necessitate changes or additions to the Final Environmental Impacts Analysis (EIA) certified by CARB with Resolution 24-14. As a result, the updates are not new information showing any significant effects not already discussed in the Final EIA, make any previously identified effects substantially more severe, or change the mitigation measures in the Final EIA, so a new analysis under CEQA is not required (CEQA Guidelines § 15162). In addition, the potential impacts the commenter identifies are speculative, which CEQA does not require lead agencies to analyze.

For more information on the updates to the analysis at issue, please see the response to Section I-6.

I-8 *Resolution 21-14 Improperly Delegates Decision Making Authority that Violates CEQA*

Comment: Resolution 24-14 purports to authorize CARB's Executive Officer to determine whether sufficiently related changes are needed to the regulatory package approved by the CARB board and to determine whether any further environmental review is required by such changes. But it does not require the Executive Officer to present the complete rulemaking package and all environmental analyses to the CARB board for final approval. Resolution 2414 thus impermissibly piecemeals environmental review, improperly delegates decision making authority, and expressly authorizes post hoc environmental review—all in violation of CEQA. To satisfy its obligations under CEQA, CARB must present the complete rulemaking package and all environmental analyses to the CARB board before the "project" is approved for purposes of CEQA.

…

However, as explained below, the procedure set forth in Resolution 24-14 for review of 15-day modifications cannot be reconciled with well-established principles of CEQA or the Fifth District's decision in POET, supra, 218 Cal.App.4th 681. The Amendments and all 15-day modifications are part of the same CEQA "project" and all environmental impacts associated with that "project" must be analyzed and considered by the CARB board before the "project" is approved for purposes of CEQA.

First, Resolution 24-14 impermissibly piecemeals environmental review. "CEQA forbids 'piecemeal' review" of a project, Berkeley Keep Jets Over the Bay Comm. v. Board of Port Comm'rs, 91 Cal.App.4th 1344, 1358 (2001), which occurs when a lead agency "attempt[s] to avoid a full environmental review by splitting a project into several smaller projects which appear more innocuous than the total planned project." East Sacramento P'ships for a Livable City v. City of Sacramento, 5 Cal.App.5th 281, 293 (2016). By authorizing two distinct phases of environmental review—one conducted by the CARB board upon approving the Amendments and certifying the EIA and one conducted by the Executive Officer upon approving the proposed 15-day modifications and any further environmental review—Resolution 24-14 proceeds as if the sufficiently related modifications were a separate "project" for purposes of CEQA.

But that is not the case. "'Project' means 'the whole of the action'" that otherwise qualifies as a "project" under CEQA. Concerned McCloud Citizens v. McCloud Comty. Servs. Dist., 147 Cal.App.4th 181, 192 (2007) (quoting Guidelines, § 15378(a)). It "'does not mean each separate governmental approval.'" Id. (quoting Guidelines, § 15378(c)). To the extent the Executive Officer makes a change to the regulatory text of the Amendments that is "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," (Govt. Code § 11346.8, subd. (c)), the change is "a reasonably foreseeable consequence of the initial project." Laurel Heights, supra, 47 Cal.3d at 396. Similarly, because the 15-day modifications to the Amendments would have no purpose but-for the Amendments, the two activities are "integral part[s]" of each other and thus both are "within the scope of the same CEQA project." Tuolumne Cty., supra, 155 Cal.App.4th at 1229. Consequently, the Amendments and all 15-day modifications must be analyzed and considered by the CARB board before the "project" is approved for purposes of CEQA. Laurel Heights, supra, 47 Cal.3d at 396.

Second, Resolution 24-14 improperly delegates decision making authority to the Executive Officer for the second phase of environmental review. As POET explains:

> CEQA is violated when the authority to approve or disapprove the project is separated from the responsibility to complete the environmental review. [Citations.] This conclusion is based on a fundamental policy of CEQA. For an environmental review document to serve CEQA's basic purpose of informing governmental decision makers about environmental issues, that document must be reviewed and considered by the same person or group of persons who make the decision to approve or disapprove the project at issue. In other words, the separation of the approval function from the review and consideration of the environmental assessment is inconsistent with the purpose served by an environmental assessment as it insulates the person or group approving the project "from public awareness and the possible reaction to the individual members' environmental and economic values.

POET, supra, 218 Cal.App.4th at 731 (quoting Kleist v. City of Glendale, 56 Cal.App.3d 770, 779 (1976)).

By transferring decision making authority to the Executive Officer in the second phase, the Resolution 24-14 impermissibly separates the responsibility for approving the "project" (i.e., the original proposal and all 15-day modifications) from the responsibility for completing environmental review, contrary to POET, supra, 218 Cal.App.4th 681.

Third, Resolution 24-14 authorizes results in post hoc environmental review. Because the initial regulatory proposal and any subsequent 15-day modifications are part of the same "project" under CEQA, authorizing the Executive Officer to perform "further environmental review" after the state board has already approved the "project" for purposes of CEQA, Resolution 24-14 expressly authorizes post hoc environmental review in violation of CEQA. (17 Cal. Code Regs., § 60004, subd. (e).). Moreover, CARB's voluminous response to comments appendix to the FSOR contains new and significantly amplified analysis of environmental and cost issues which were not before the Board when the project was approved in November.

Accordingly, to comply with its obligations under CEQA, CARB must present the Amendments, all 15-day modifications, and all environmental analyses to the CARB board before the "project" is approved. (15d3-069.7)

> **Agency Response:** No changes were made in response to this comment, which does not include a specific recommendation for a change to the rulemaking proposal.
>
> Resolution 24-14 does not improperly delegate to the Executive Officer the authority to conduct further environmental review associated with the Third 15-day modifications. Resolution 24-14 states, "The Board delegates to the Executive Officer the authority to both (1) either approve or disapprove proposed changes in regulatory language under Government Code section 11346.8(c), and (2) conduct any appropriate further environmental review associated with such changes, consistent with the Board's Certified Regulatory Program regulations, at California Code of Regulations, title 17, sections 60000-60008, for those sufficiently related substantial modifications."
>
> CARB's Certified Regulatory Program (CRP) is a CEQA-equivalent process that an agency uses in lieu of traditional CEQA review and is certified by the Natural Resources Agency. Subsection 60004(e) of the CRP specifies that the state board may delegate to the Executive Officer authority to carry out changes to proposed regulatory language

under Government Code section 11346.8(c), as well as any appropriate further environmental review associated with such changes. This delegation approach, set forth both in CARB's CRP and in Resolution 24-14, was developed specifically to align with the court's holding in the *POET* decision referenced by the commenter. Here, the Board approved the project at its November 2024 Board meeting. The Executive Officer's delegated authority here concerns subsequently-proposed modifications to the originally-approved project – *not* pre-approval modifications, as suggested by the commenter. The Executive Officer's delegated authority here extends both to (1) either approving or disapproving the modifications, and (2) conducting any further environmental review (to the extent needed) associated with those changes. This delegated authority is fully consistent with both CARB's CRP and CEQA's general principles regarding delegation, including those set forth in *POET*.

Similarly, the commenter's assertions of improper "piecemealing" are incorrect. Piecemealing occurs where: (1) the project reviewed in the EIR is an intended or necessary "first step toward future development"; and (2) the project "legally compels or practically presumes completion of another action. (See *Banning Ranch Conservancy v. City of Newport Beach* (2012) 211 Cal.App.4th 1209, 1223.)

Here, CARB adopted a single EIA that analyzed the potentially significant adverse and beneficial environmental impacts resulting from implementation of the LCFS Amendments and their associated reasonably foreseeable compliance responses.

The LCFS Amendments were analyzed and contemplated by the EIA, and the Final EIA adequately addresses the implementation of the proposed amendments as modified by the proposed modifications. The proposed modifications to the LCFS Amendments would not constitute a substantial change or new information resulting in any new significant effects or a substantial increase in the severity of previously identified significant effects.

For explanation of why no additional environmental review is required beyond what CARB certified and adopted with Resolution 24-14, please see the responses to Sections D-5, J-1.2, I-7 as well as the CEQA addendum in Attachment B to Executive Order R-25-001.

J Hydrogen

J-1 *Oppose Inclusion of Fossil Hydrogen with CCS*

J-1.1 Multiple Comments: *Oppose Inclusion of Fossil Hydrogen with CCS/No Fossil Hydrogen Should Earn Credits*

Comment: While I support California's efforts to reduce carbon intensity in the transportation sector, I urge CARB to prioritize true zero-emission solutions over transitional or unproven technologies like hydrogen produced with carbon capture and sequestration (CCS). Allowing fossil-based hydrogen with CCS to count toward renewable hydrogen requirements risks prolonging dependence on fossil fuel infrastructure, which harms air quality. (15d3-009.1)

Comment: However, the changes in subsection 95482(h) that make fossil hydrogen with carbon capture and sequestration eligible for the 80 percent renewable hydrogen (CCS) renewable hydrogen requirement by 2030 is a substantial policy change. It is not appropriate to make such a change without stakeholder feedback and Board approval.

Board resolution 24-14 directs the Executive Office to monitor hydrogen fuel availability and to report back and propose any adjustments to the Board as part of the next scoping plan update. This language does not authorize the Executive Office to make changes to the regulation without Board approval.

We suggest this change be removed and changes to the regulation following the board vote be limited to addressing issues raised by OAL. (15d3-035.1)

Comment: The proposed 15-day changes increase CARB's reliance on the LCFS to incentivize hydrogen production by authorizing LCFS credits for hydrogen fuels produced using carbon capture and sequestration ("CCS") or produced using CCS in combination with avoided methane credits via book-and-claim accounting.[9] CARB lacks the statutory authority to use the LCFS for its hydrogen policy objectives and as such the amendments to section 95482(h) are ultra vires…CARB's proposed LCFS amendments exceed its statutory authority when it unilaterally decides to use the LCFS to build-out hydrogen fuels and infrastructure post-2030. As set forth in Commenters' prior comments, the Legislature has not authorized such rulemaking authority for post-2030 policy or otherwise directed CARB to use the LCFS as the mechanism for developing hydrogen infrastructure or stationary source fuels. Because CARB does not operate with unbound rulemaking authority, CARB may not proceed as proposed to develop hydrogen fuels post-2030 or otherwise use the LCFS to build out hydrogen for use by stationary sources. The Legislature has not authorized CARB to adopt rules or regulations to achieve reductions in greenhouse gas emissions to achieve post-2030 policy objectives, including building out hydrogen fuels and hydrogen infrastructure for stationary sources. Nor did the Legislature give CARB such authority in Senate Bill 596 or Senate Bill 1075. Senate Bill 596 directs CARB to prepare a comprehensive strategy for the cement sector by July 1, 2023, one of the hard to decarbonize stationary source sectors which the 2022 Scoping Plan Update identifies. The Legislature authorizes CARB to implement that cement strategy only "upon appropriation by the Legislature" and to date CARB has only produced a draft strategy which identifies hydrogen as a potential fuel for the cement sector. In Senate Bill 1075, the Legislature directed CARB to prepare an evaluation of hydrogen, including green hydrogen, by June 1, 2024, that shall include policy recommendations, a description of potential strategies supporting hydrogen infrastructure, and an analysis of hydrogen use as a climate strategy. Senate Bill 1075 did not authorize CARB to adopt rules or regulations to implement the hydrogen strategy.

CARB proposes changes to section 95482(h) to authorize, after January 1, 2030, hydrogen fuels produced using CCS or using CCS in combination with avoided methane credits through book-and-claim accounting. To date, CARB has not produced the Senate Bill 1075 report and the Legislature has not given CARB rulemaking authority. CARB lacks the statutory authority to adopt this amendment, and the proposed changes are thus ultra vires. (15d3-053.2)

Comment: we urge CARB to (1) reject increased subsidies for fossil-fuel derived hydrogen. (15d3-064.1)

Comment: CARB must reject staff's proposed revision of the Board's decision to both end subsidies for fossil hydrogen by 2035 and require 80% "renewable" hydrogen by 2030.

The LCFS amendments that the CARB Board approved in November mandate that (1) starting in 2035, fossil fuel-derived hydrogen can no longer receive LCFS subsidies and that (2) 80% of hydrogen dispensed as a vehicle fuel must be "renewable" by 2030.[3] The newly proposed changes would reverse course on both fronts. Specifically, they would exempt fossil hydrogen

from the 2035 phase-out so long as that fossil hydrogen is paired with CCS technologies, and they would allow this fossil hydrogen paired with CCS to count toward the 80%-by-2030 requirement.[4] CARB must reject these changes because they lack evidentiary support and will cause a wide range of environmental harms.

A. CARB staff fails to justify this significant and harmful departure from the policy that the Board adopted at its November 2024 hearing.

The OAL did not identify any issues that would require amendment of Subsection 95482(h) and CARB staff has not identified evidence to support changes that section. In the Final Statements of Reasons (FSOR), responding to comments critical of Subsection 95482(h)'s limits on fossil hydrogen, CARB states that "timing of this provision in the Proposed Amendments aligns with the current operational timeline for projects funded under the hydrogen hubs grants, which will expand the supply of renewable hydrogen in California starting in the early 2030s and aligns with mandates that 90% of electricity retail sales be renewable or zero carbon by 2035 (SB 1020 (Laird, Chapter 361, Statutes of 2022))."[5] In the changes that CARB staff now proposes, it has not identified any new facts since publication of the FSOR that alter this rationale.

CARB staff states that the proposed modifications to this Subsection "would allow the LCFS to further support growing supplies of low-CI hydrogen in alignment with federal incentives and investment in carbon dioxide removal technology as well as California's 2022 Scoping Plan for Achieving Carbon Neutrality."[6] However, the Scoping Plan cannot justify this weakening of the LCFS. Indeed, the certified Environmental Impact Analysis (EIA) for the amendments explains that excluding fossil-derived hydrogen from the LCFS will align the regulation with the 2022 Scoping Plan Update. In relevant part, it states:

> The 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 the State'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.[7]

It would be illogical to encourage investments in long-lived assets to capture carbon dioxide at fossil hydrogen production facilities when the 2022 Scoping Plan Update does not foresee this equipment operating in a carbon-neutral California in 2045. Thus, the proposal would encourage investment in stranded fossil fuel infrastructure, in direct conflict with the 2022 Scoping Plan Update.

CARB staff's other stated rationales for the proposed changes are equally unpersuasive. Subsection 95482(h) already aligns with federal incentives because it provides a market for renewable hydrogen that the federal government is incentivizing with a generous $3/kg production tax credit.[8] Even if the federal government also provides incentives for fossil hydrogen, that federal policy does not justify weakening California's rules to accommodate fossil fuels that are inconsistent with the State's plan for achieving its climate goals. Also, it is unclear what the proposed change to Subsection 95482(h) has to do with "investment in carbon dioxide removal technology," which are strategies for taking carbon out of the atmosphere—not abating a specific facility's emissions.[9] (15d3-064.3)

Comment: Third, the issues raised by these proposed changes were not addressed at the November 8, 2024 Board hearing and could not have been anticipated from the existing record. CARB never proposed allowing fossil hydrogen paired with CCS to count toward the 80%-by-2030 goal nor did it suggest that it would exempt such hydrogen from the 2035 phase

out deadline. There was no discussion of this possibility at the Board hearing, and the public could not have anticipated CARB's reversal in its hydrogen policy based on the record. As noted above, CARB's statements justifying the Board-approved version of Subsection 95482(h) indicated to the public that CARB thought only renewable hydrogen was consistent with 2022 Scoping Plan update, not hydrogen derived from fossil fuels, as now proposed. In response to myriad comments about Subsection 95482(h)'s consistency with the Scoping Plan, CARB stated in the FSOR that Subsection 95482(h) aligns with the Scoping Plan because "[t]he 2022 Scoping Plan Update scenario did not include hydrogen produced from fossil fuels, with or without carbon capture, as low-carbon, renewable hydrogen."[30] CARB also stated in the FSOR that "[t]he proposed amendments do not preclude the use of carbon capture and sequestration on hydrogen production, provided that fossil gas is not the primary feedstock."[31] Also, responding to comments critical of Subsection 95482(h)'s limits on fossil hydrogen, CARB asserted that "timing of this provision in the Proposed Amendments aligns with the current operational timeline for projects funded under the hydrogen hubs grants, which will expand the supply of renewable hydrogen in California starting in the early 2030s and aligns with mandates that 90% of electricity retail sales be renewable or zero carbon by 2035 (SB 1020 (Laird, Chapter 361, Statutes of 2022))."[32] Thus, none of CARB's statements in the record indicate that it would reverse course on these fossil hydrogen limits. And as noted above, in the changes that CARB staff now proposes, it has not identified any new facts since publication of the FSOR that alter its FSOR rationale.

CARB's EIA also underscores the centrality of the fossil hydrogen limits in Subsection 95482(h) to CARB's regulatory package as approved for adoption by the Board. In the EIA's "Description of the Proposed Amendments to the Low Carbon Fuel Standard," CARB lists "Remove Eligibility of Fossil Fuel-Derived Hydrogen" as one of the major changes to the regulation, and again states that "[t]he 2022 Scoping Plan Update scenario did not include hydrogen produced from fossil fuels, with or without carbon capture as low-carbon, renewable hydrogen."[33] Thus, there was no reason for the public to anticipate that CARB would change course and later claim that hydrogen made from fossil fuels and paired with CCS would be deemed consistent with the 2022 Scoping Plan or allowed to generate credits beyond 2035, when the EIA's analysis and findings were based on a Project that ended credits for all fossil hydrogen in 2035.[34] Because the proposed changes were not addressed at the public hearing and could not have been anticipated from the existing record, they must be subject to the appropriate public process under the APA. Cal. Gov. Code §§ 11349.4 (a); 11346.8(c).

Finally, the proposed changes are directly contrary to Board Resolution 24-14. In relevant part, the resolution directs the Executive Officer to "monitor, report back to the Board as part of the next Scoping Plan Update, and propose any adjustments, if any of the following conditions may impede successful expansion of similar GHG reduction policies in other jurisdictions or impede the ability of the State to achieve its air quality and climate goals, and transition to zero emission technology," including "[h]ydrogen fuel availability to meet growing demand and role of state and federal incentives, including alignment with federal hydrogen incentives to increase hydrogen supply;"[35] This direction specifically contemplates the possibility of future changes to state and federal hydrogen policy as well as hydrogen supply and mandates the following course of action: (1) the Executive Office must report back to the Board at the next Scoping Plan update (which is required by 2027); (2) based on that reported information, the Board will review and approve of any "adjustments" to the LCFS regulations. The Resolution 24-14 does not authorize any changes to the regulation's hydrogen provisions at this juncture, nor does it authorize the Executive Officer to make changes to the regulations without Board consideration and approval. Thus, CARB must readopt the regulation if it makes the proposed Subsection 35482(h) changes. (15d3-064.8)

Comment: The Center for Biological Diversity and Food & Water Watch submit the following comments on the portion of the proposed amendment to the Low Carbon Fuel Standard ("LCFS") creating post-2035 LCFS credits for production of fossil methane-based hydrogen accompanied by carbon capture and sequestration ("CCS"), found at ATTACHMENT A-1, Proposed Regulation Order – Proposed Amendments to the Low Carbon Fuel Standard Regulation1 (LCFS credit for fossil-fuel derived hydrogen after 2035) ("Amendment"). The Amendment would expand the ways that fossil-fuel derived hydrogen can generate LCFS credits after 2035, and in so doing will incentivize the production of more fossil methane, a dangerous greenhouse gas. The Amendment adds use of CCS in the production of hydrogen from fossil methane as a mechanism to create LCFS credits. In this proposal, fossil fuel-derived hydrogen phases out of the LCFS by 2035 unless it is paired with factory farm gas credits or 100% produced with CCS. The CCS part of this is new.

We oppose the Amendment for four reasons: 1) CCS is an unproven, potentially dangerous technology that should not be a part of California's hydrogen policy; 2) hydrogen does not fit within the LCFS CCS Protocol; 3) enhancing fossil methane production is counter to California's greenhouse gas ("GHG") policies and will lead to additional methane emissions from production and transportation; and 4) because of the items above, if CARB is to proceed with this amendment, a supplemental EIR is required.

1. **CCS Should Not Be Part of California's Hydrogen Policy**

CCS is a risky, unproven technology that should not be part of California's hydrogen policy. The Center for Biological Diversity's February 20, 2024 letter to CARB on the proposed LCFS amendments pointed out the dangers of CCS. As the Center explained in that letter:

[T]he only form of hydrogen that should be considered under any provision in the LCFS is "green hydrogen," or hydrogen made by splitting water into hydrogen and oxygen using 100% solar or wind energy, while adhering to the three pillars . . . CARB should not be incentivizing and prolonging the use of fossil fuels in any manner. This includes fossil fuels plus CCS. Facilities using CCS do not capture 100% of their climate-harming emissions, they incur a high energy penalty (meaning more energy use and emissions), and fossil fuel production is rife with environmental and health harms. Phasing out fossil fuels should be a fundamental tenant [sic] of any climate-focused policy, but CARB insists on carving out ways for fossil fuels to continue . . . These carve outs must end.

2. Hydrogen Does Not Fit Within the LCFS CCS Protocol

Green hydrogen produced by electrolysis does not produce CO2 or any GHGs as a byproduct. But hydrogen made from methane steam reforming does, to the tune of roughly 7 kg of CO2 produced for each kg of hydrogen created. The "Applicability" section of the Protocol states: "The Carbon Capture and Sequestration (CCS) Protocol applies to CCS projects that capture carbon dioxide (CO2) and sequester it onshore, in either saline or depleted oil and gas reservoirs, or oil and gas reservoirs used for CO2-enhanced oil recovery (CO2-EOR)." The Protocol, however, was designed to allow transportation fuels whose lifecycle emissions have been reduced through CCS to become eligible for LCFS credits. Hydrogen has many potential uses in addition to fuel cells used for transportation, including possibly decarbonizing hard-to-electrify industries such as steel and cement making, so it does not fit squarely within the purpose of the Protocol. To be consistent, if the proposed Amendment is adopted, the Protocol should be amended to include all uses of hydrogen produced in association with CCS, and that amendment should be analyzed under CEQA.

3. **Production And Distribution of Fossil Methane Should Not Be Encouraged**

Methane is a powerful greenhouse gas. The Amendment would provide a new market for fossil methane in California: supporting LCFS credits for hydrogen created by methane steam reformation. This is not consistent with California's policy of reducing reliance on fossil fuels. In addition, the production and distribution of methane itself are plagued by leaks. As U.S. EPA explains for natural gas systems:

> Methane emissions occur in all segments of the natural gas industry, from production, through processing and transmission, to distribution. They primarily result from normal operations, routine maintenance, fugitive leaks, and system upsets.
>
> As gas moves through the system, emissions occur through intentional venting and unintentional leaks. Venting can occur through equipment design or operational practices, such as the continuous bleed of gas from pneumatic devices (that control gas flows, levels, temperatures, and pressures in the equipment), or venting from well completions during production. In addition to vented emissions, methane losses can occur from leaks (also referred to as fugitive emissions) in all parts of the infrastructure, from connections between pipes and vessels, to valves and equipment.

And as the MIT Technology Review reports:

> The US Environmental Protection Agency estimates that roughly 1% of oil and gas produced winds up leaking into the atmosphere as methane pollution. But survey after survey has suggested that the official numbers underestimate the true extent of the methane problem.

As California is experiencing more and more damage from climate change, including increasingly severe wildfires, this is not the time to put more methane into the atmosphere. (15d3-067.1)

> **Agency Response:** No changes were made in response to these comments.
>
> The proposed modifications to subsection 95482(h) advance the objectives of the proposed amendments to "Incentiviz[e] more production of clean fuels needed in the future, such as low-carbon hydrogen;" to "Support[] electric and hydrogen truck refueling;" to "Increas[e] the stringency of the program to more aggressively decarbonize fuels and thereby reduce our dependence on fossil fuels;"[11] and to "improve California's long-term ability to support the production and use of increasingly lower-CI transportation fuels and to improve the program's overall effectiveness"[12] in alignment with California's broader decarbonization policy and pertinent authorities. The proposed modifications also support California's goals to increase volumes of affordable low-carbon fuels in the transportation sector.[13] Currently, almost all of California's hydrogen production capacity comes from fossil gas steam methane reformation at or nearby refining facilities. The State is prioritizing efforts to expand the supply of low-carbon hydrogen from non-fossil feedstocks through efforts like the Alliance for

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[11] California Air Resources Board, *Notice of Public Hearing to Consider Proposed LCFS Amendments* (LCFS 45-day Notice). Page 4. *https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/lcfs_notice.pdf*.
[12] California Air Resources Board, *Initial Statement of Reasons*, 2024. Page 22. *https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/isor.pdf*.
[13] California Legislature, *Senate Bill 2 Energy: transportation fuels: supply and pricing: maximum gross gasoline refining margin.* Signed March 28, 2023. *https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202320241SB2*.

Renewable Clean Hydrogen Energy Systems (ARCHES), and other State funding programs. But efforts like ARCHES and other low-carbon hydrogen production efforts are reliant on federal funding and tax credits authorized as part of the 2021 Infrastructure Investment and Jobs Act (IIJA) and the 2022 Inflation Reduction Act (IRA) to be economically viable, given the higher production costs of renewable hydrogen. In recent months and since the publication of the FSOR, federal funding has become increasingly uncertain, which in turn has added uncertainty in investment decisions for low-carbon hydrogen production. Without available and affordable low-carbon hydrogen supplies to meet growing hydrogen FCEV demand as identified in the 2022 Scoping Plan Update, California risks being unable to transition away from combustion fuels and into zero-emission technology due in part to high costs driven by high energy supply costs combined with station development costs. The modifications to subsection 95482(h) provide necessary flexibility to produce low-carbon hydrogen and reflect the realities that FCEV deployment depends on economically viable hydrogen supply, and that renewable hydrogen supply may fluctuate in response to market dynamics. While this policy modification supersedes Agency Response O-1 in the FSOR as to the removal of the phase-out of fossil hydrogen with CCS, it remains consistent with the low-carbon hydrogen objectives initially set forth in staff's notice package.[14]

Hydrogen used as a transportation vehicle fuel and produced with accompanying carbon capture and sequestration technology[15] would be expected to have a low lifecycle carbon intensity. Staff proposes to allow hydrogen produced with accompanying carbon capture and sequestration technology to count toward the 80% minimum low-CI hydrogen dispensing requirement to receive credits between 2030 and 2035, and to exclude hydrogen produced with accompanying carbon capture and sequestration technology from the complete phaseout of LCFS crediting for fossil-derived hydrogen starting in 2035. As mentioned on page 3 of the Third 15-Day Notice, the modification "would allow the LCFS to further support growing supplies of low-CI hydrogen in alignment with federal incentives and investment in carbon dioxide removal technology as well as California's 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan Update)."

Specifically, the 2022 Scoping Plan Update states:

> "Carbon removal and sequestration will be an essential tool to achieve carbon neutrality, and the modeling clearly shows there is no path to carbon neutrality without carbon removal and sequestration…

[14] California Air Resources Board, Notice of Public Hearing to Consider Proposed LCFS Amendments (LCFS 45-day Notice). Page 4. *https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/lcfs_notice.pdf*; California Air Resources Board, Initial Statement of Reasons, 2024. Page 22. *https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/isor.pdf*.

[15] In order to generate LCFS credits associated with the use of carbon capture and permanent sequestration, hydrogen produced with carbon capture and sequestration would need to satisfy the eligibility requirements and conditions specified in the Carbon Capture and Sequestration Protocol under the Low Carbon Fuel Standard (CCS Protocol) incorporated by reference by section 95490 of the LCFS regulation along with other applicable requirements.

CCS can support hydrogen production until such time as there is sufficient renewable power for electrolysis and an abundant water source."[16]

The current LCFS regulations incorporate provisions that guide the utilization of CCS to reduce greenhouse gas emissions associated with transportation fuel production, including hydrogen. Among other legislative elements related to CCS, SB 905 (Caballero, Chapter 359, Statues of 2022) requires CARB to create a Carbon Capture, Removal, Utilization, and Storage Program to evaluate, demonstrate, and regulate CCUS and carbon dioxide removal (CDR) projects and technology. The current LCFS regulation incorporates CARB's CCS Protocol establishing requirements for carbon management projects to become certified by demonstrating the capacity for permanent carbon sequestration, after which those projects may generate LCFS credits associated with eligible sequestered emissions.[17] CCS is not a new concept or technology. Twenty years of CCS testing show it is a safe and reliable tool, and projects certified under CARB's CCS Protocol must successfully demonstrate adherence to rigorous pre-construction, operational, and site closure standards designed to strengthen environmental performance, as described in the protocol.

The 2022 Scoping Plan Update also mentions "producing hydrogen required under the Scoping Plan Scenario with electrolysis would require about 10 gigawatts (GW)151 of additional solar capacity. If steam methane reformation is paired with CCS, the hydrogen produced could potentially be low carbon. Additionally, the biomethane used to generate hydrogen could be sourced from gasification of forest or agricultural waste resulting from forest management and other NWL management practices, which could also lead to net negative carbon outcomes. Steam methane reformation paired with CCS can thus ensure a rapid transition to hydrogen and increase hydrogen availability until such time as electrolysis with renewables can meet the ongoing need, assuming there is also sufficient water supply." The proposed modification does not expand the LCFS definition of renewable hydrogen to include fossil gas SMR with CCS. Instead, the modification simply makes this type of hydrogen eligible to receive LCFS credits based on the life cycle carbon intensity for that energy type.

As modified, subsection 95482(h) continues to provide reasonable and appropriately limited incentive signals for LCFS crediting for hydrogen dispensed as a vehicle fuel, which directly meets the objective of the LCFS program to decarbonize the transportation sector within the framework of California's broader decarbonization goals. CARB's direction in Resolution 24-14 that staff monitor hydrogen fuel availability, report back on that monitoring to the Board as part of the next Scoping Plan Update, and propose any adjustments to the LCFS if warranted is consistent with the proposed modification to subsection 95482(h).

See FSOR Appendix A Agency Response O-2 for further information. This response also supersedes FSOR Appendix A Agency Response O-1 and revises the response for alignment with the Third 15-Day modifications.

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[16] California Air Resources Board, *2022 Scoping Plan for Achieving Carbon Neutrality*. Pages 84-86. November 16, 2022. *https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf*.

[17] California Air Resources Board, *Carbon Capture and Sequestration Protocol under the Low Carbon Fuel Standard*. August 13, 2018. *https://ww2.arb.ca.gov/sites/default/files/2020-03/CCS_Protocol_Under_LCFS_8-13-18_ada.pdf*.

For explanation of why no supplemental environmental review is necessary for this modification, please see Agency Response to Section J-1.2 below.

J-1.2 Multiple Comments: *Fossil Hydrogen with CCS Poses Environmental and Human Health Risks and Requires Additional Environmental Review*

Comment: CARB must reject these changes because they lack evidentiary support and will cause a wide range of environmental harms.

…

Expanding California subsidies for fossil-fuel derived hydrogen paired with CCS poses numerous risks to the environment and human health.

Fossil hydrogen production with CCS creates significant impacts upstream throughout the fossil gas supply chain, harms the communities closest to the production facilities, and imposes downstream risks associated with the transportation and storage of carbon dioxide. CARB does not address any of these risks or impacts in its proposal to weaken Subsection 95482(h). As detailed below in Section III, these impacts are potentially significant and have not been evaluated in the EIA.

Producing hydrogen from fossil gas induces more production of fossil fuels, with concomitant harms to public health and the environment. Adding CCS to the process increases the demand for fossil gas because CCS equipment requires a significant amount of energy to operate.[10] One reason that the hydrogen industry's demand for fossil gas threatens public health is that many kinds of equipment throughout the fossil gas supply chain emit hazardous and carcinogenic air pollution.[11] This upstream activity also destabilizes the climate by emitting methane. Indeed, the high methane emissions observed in the fossil gas supply chain are a key reason why one recent study found that hydrogen produced from fossil gas with CCS is an even more greenhouse gas-intensive source of heat than fossil gas or coal.[12]

In implementing the LCFS, CARB fails to properly account for these upstream methane emissions because they rely on a version of the GREET model that improperly assumes an upstream leakage rate of about 1%. This flawed assumption stems from two basic methodological errors: relying on self-reported data from the oil and gas industry and using national data, when California's gas supply comes from shale fields with especially high leakage rates. According to one recent study, on average, fossil gas consumed in California has a production-stage methane leakage rate of 2.8%. Thus, CARB ignores about two thirds of the significant upstream climate impacts of producing hydrogen from fossil fuels with CCS for use in the LCFS.

Producing hydrogen from fossil gas with CCS is a heavy industrial activity with several potentially significant local environmental impacts. The dominant technology for producing hydrogen from fossil fuels in California and the rest of the United States is steam methane reformation (SMR). As detailed in prior comments and recent studies, SMR facilities release criteria air pollution[15] and hazardous air pollution.[16] Powering energy-hungry CCS equipment could further increase emissions.[17] Also, CCS equipment that uses amine-based solvents could cause additional environmental and public health harms because these solvents are potential carcinogens that adversely affect aquatic life and may contribute to smog formation and contaminate drinking water.[18] After the solvent is used, the degraded amine product becomes hazardous waste. Producing hydrogen from fossil fuels with CCS could also

threaten local water supplies, as SMR of fossil gas with CCS requires more water than electrolytic hydrogen production.

Producing hydrogen with CCS also creates downstream impacts from transporting and storing carbon dioxide. Carbon dioxide pipelines pose various environmental and health threats. Carbon dioxide's interaction with impurities, such as water and hydrogen sulfide, can compromise pipe integrity and increase the risk of corrosion and failure, which could lead to the re-release of carbon dioxide into the atmosphere and lead to a public health emergency because carbon dioxide is an asphyxiant.[21] Long-term carbon dioxide sequestration via saline aquifers poses various environmental threats, including potential contamination of shallow aquifer waters and leakage of carbon dioxide back into the atmosphere. (15d3-064.4)

Comment: Additional environmental review, including review of localized impacts, is required if CARB does not reject the proposed changes to Subsection 95482(h).

In addition to requiring readoption under the APA, CARB's proposed changes to Subsection 95482(h) will alter the Project such that new and additional environmental review is required under CEQA. Whenever a public agency must make a further discretionary decision to carry out or approve a project for which it has previously issued an approval, the agency must determine whether further environmental review is required due to changes in the project, changes in circumstances, or new information. Department of Water Resources Environmental Impact Cases (2022) 79 Cal.App.5th 556, 576. Here, CARB has proposed significant Project changes after the close of public comment and certification of an EIA. As discussed above in Section II, CARB's proposed new, significant changes to the Project require the agency to readopt the regulation to comply with Section 11349.4(a) of the APA. Because readoption is a discretionary decision, CARB must determine whether additional CEQA review is required due to these Project changes. 14 Cal. Code Regs. 15162(a), (c); see Willow Glen Trestle Conservancy v. City of San Jose (2020) 49 Cal.App.5th 127, 131. Significant project changes require CEQA review when, as here, the changes will result in new and worsened environmental impacts that have not been analyzed in an environmental review document. Pub. Resources Code § 21166(a);14 Cal. Code Regs. 15162(a)(1).

The proposed changes to Section 954852(h) are significant because the changes go beyond mere ministerial modifications of the previously analyzed Project. See Communities for a Better Environment v. South Coast Air Quality Management Dist. (2010) 48 Cal.4th 310 (finding applicant's proposal to produce ultra-low sulfur diesel at oil refinery was not a mere modification where it would result in significant increased operation of polluting equipment). As explained throughout these comments, the Proposed changes substantially alter the limits placed on fossil hydrogen in the LCFS in ways that would trigger readoption under the APA. See Section II.

These significant changes to the LCFS amendments would also result in new and worsened environmental impacts by altering LCFS credit generation for fossil hydrogen paired with CCS, requiring the need for subsequent or supplemental CEQA review. See Citizens Comm. to Complete the Refuge v. City of Newark (2021) 74 Cal.App.5th 460, 475 (concluding that the need for additional environmental review arises when there is a need to evaluate new or more severe significant environmental impacts that will result from changes to a project). As Section I.B. explains, fossil hydrogen production with CCS creates significant impacts throughout the supply chain, harming communities closest to hydrogen production facilities and generating downstream risks because of storage and transportation of carbon dioxide. Additionally, CCS equipment that uses amine-based solvents could cause additional environmental and public

health harms, including smog formation, drinking water contamination, and impacts to aquatic life. See Section I.B.

None of these additional and worsened environmental impacts have been discussed or considered in the EIA. The EIA did not analyze both the production and downstream impacts of CCS with SMR facilities and downplayed the likelihood of significant impacts from CCS processes. For example, the EIA incorrectly suggests that CCS at SMR facilities would not use amine-based solvents because those facilities do not have "low-purity CO2 streams."[36] However, CARB itself has recently recognized that SMR facilities with carbon capture use amine separation.[37] Indeed, among the small handful of projects that have demonstrated SMR with CCS, multiple facilities have used amine-based solvents.[38] Academics are also attempting to refine the process of capturing carbon emissions from SMR facilities with amine-based technologies.[39] The U.S. Department of Energy is funding a CCS project at an SMR facility in Texas that does not plan to use an amine-based solvent to capture carbon dioxide from its syngas, but does intend to rely on an amine-based solvent to capture carbon from the flue gas stack that contributes about 45% of the facility's emissions.[40] An SMR facility could not plausibly operate in a manner that is consistent with California's long-term climate goals if it fails to abate the low-purity carbon dioxide stream in its flue gas emissions. Thus, CARB's environmental analysis cannot deny or ignore the potential environmental consequences of hydrogen producers deploying amine-based CCS technologies.

Because the proposed changes incentivize more fossil hydrogen and additional CCS, which will foreseeably result in new, additional impacts such as those from amine solvents, among others, CARB must analyze the environmental impacts of its proposed changes now in a subsequent or supplemental EIA in order to comply with CEQA. Alternatively, CARB should decertify the LCFS Amendments' EIA, conduct the environmental analysis anew because of these proposed changes, and recirculate the document for public comment and review.

Importantly, any environmental review must address the impacts of fossil hydrogen production and CCS on adjacent communities. The locations of fossil hydrogen producers that sell into the LCFS are known. In its air quality modeling spreadsheet CARB lists "California SMR Hydrogen Facilities," which are located in at least three air districts throughout the State.[41] CARB knows which existing SMR facilities produce hydrogen that generates LCFS credits, providing a strong indication of which facilities will further ramp up hydrogen production to supply the growing market for hydrogen as a transportation fuel. The Current Fuel Pathways spreadsheet, which contains a list of certified LCFS pathways, also identifies hydrogen producers and their locations.[42] Finally, a 2019 study has also listed the locations of all SMR facilities.[43]

CARB admits in the EIA that "[s]taff expects proposed amendments will increase the production of low-carbon fuels in California, which will result in increased emissions at the production facilities."[44] The addition of the proposed changes to Subjection 95482(h) would only increase such emissions for the reasons described above in this Section and Section I.B. CARB must connect this data and assess the impact of increasing hydrogen production on communities impacted by these hydrogen and CCS facilities. This sort of analysis is not only appropriate but required, even for a programmatic environmental review such as this one. See Cleveland National Forest Foundation v. San Diego Association of Governments (2017) 17 Cal.App.5th 413, 440. As noted in prior comments, submitted before the Board hearing, it is insufficient for CARB to simply conclude, without analysis, that long-term air quality impacts of the Amendments will be significant and unavoidable. CARB must analyze the foreseeable air quality impacts from new or expanding hydrogen production and CCS expansion. CARB's

failure to disclose localized impacts and analyze the public health and air quality implications would leave the public and decisionmakers in the dark about the Project's pollution burdens and public health impacts to frontline communities. The programmatic nature of environmental review does not excuse CARB's failure to disclose and assess the magnitude and severity of air quality impacts from the Amendments' impacts on hydrogen production at already existing SMR facilities and expected new facilities, which would likely be located near known freight corridors to reduce the costs of serving the heavy-duty freight vehicles that are most difficult to electrify. Failing to provide this analysis would violate CEQA. (15d3-064.9)

Comment: A Supplemental EIR Is Required for This Amendment

Under CEQA Guidelines Section 15162(a), a supplemental EIR should be prepared when:

(1) Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;

…

(3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the negative declaration was adopted, shows any of the following:

A. The project will have one or more significant effects not discussed in the previous EIR or negative declaration;
B. Significant effects previously examined will be substantially more severe than shown in the previous EIR;
C. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or
D. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

CARB has the discretion to approve or reject the Amendment and so may prepare a supplemental EIR. In these circumstances it must, under subsections (1) and (3) above.

First, there will be new significant environmental effects due to the volume of methane that will be lost to the atmosphere in the production and distribution of methane for use in methane steam reforming to create hydrogen. That volume should be analyzed and mitigation measures developed under CEQA.

Second, the project will have a significant effect not discussed in the prior EIR: methane emissions in connection with hydrogen production due to methane leakage.

Accordingly, CARB should prepare a supplemental EIR before enacting the Amendment. (15d3-067.2)

> **Agency Response:** No changes were made in response to these comments, which do not include a specific recommendation for a change to the rulemaking proposal.
>
> Please see response to comment J-1.1 for explanation of the basis for the proposed Third 15-day modifications to subsection 95482(h), including explanation that the

modifications are consistent with the objectives of the rulemaking and California's decarbonization goals and policy.

The Third 15-day Notice included a determination that the modifications included in the package:

> "do not change implementation of the regulation in any way that affects the conclusions of the Final Environmental Impact Analysis (EIA) certified by CARB with Resolution 24-14. The modifications primarily consist of clarifications that do not alter the compliance responses or associated identified environmental impact conclusions. Any modifications that may affect compliance responses do not result in any new reasonably foreseeable significant environmental impacts or substantially increase the severity of an identified environmental impact. Therefore, the Final EIA adequately addresses the modifications, and no additional environmental analysis is required."

CARB has determined that the proposed modifications to the LCFS Amendments do not involve any changes that result in any new significant adverse environmental impacts or a substantial increase in the severity of the significant adverse impacts previously disclosed in the Final EIA. The Final EIA analyzed reasonably foreseeable compliance responses that the amendments are expected to continue to support, including hydrogen transportation fuel production and development of carbon capture and sequestration operations. For example, production of hydrogen from fossil natural gas feedstocks is listed as a compliance response on pages 24 and 36 and the use of CCS in connection with transportation fuel production on page 38 of the Final EIA. These compliance responses are analyzed as part of the Final EIA. Because the LCFS does not specify the specific sites at which compliance projects are to take place or specific technology to be used (e.g., hydrogen produced from fossil fuel and CCS technology), both the extent and location of new facilities cannot be known at this time and would be too speculative to quantify. Any hydrogen produced from methane using CCS would go through local environmental review where local impacts would be identified and mitigated. For further analysis, please see the CEQA addendum in Attachment B to Executive Order R-25-001.

J-1.3 *Including Fossil Hydrogen using CCS in the Amendments Exceeds Scope of Changes from OAL's Recommendations*

Comment: Second, the proposed changes improperly exceed the scope of the changes that OAL called for in disapproval decision. Pursuant to Government Code Section 11349.1, OAL reviewed the proposed LCFS amendments and found that they failed to comply with the APA's procedural and clarity requirements.[28] OAL provided a detailed discussion of the 26 sections that required revision and identified procedural deficiencies.[29] Nowhere in its discussion did OAL identify concerns with Subsection 95482(h). Indeed, the OAL decision does not so much as mention the word hydrogen. Likewise, in its justification of the proposed Subsection 95482(h), CARB staff does not assert that they were made in response to OAL's decision. Without following the procedure set forth in the APA, CARB may not seize upon the OAL's disapproval of its regulation to substantively change key provisions of the regulation. But for the OAL's disapproval, the LCFS amendments as submitted to OAL for approval would have been adopted and deemed effective when OAL reached its approval decision in February. CARB cannot take another bite at the apple and change LCFS hydrogen policy simply because it submitted a regulation that was rejected by OAL. The APA prohibits such

machinations by requiring readoption for any significant changes made after OAL review, Cal. Gov. Code § 11349.4(a), and by setting forth detailed procedures for public participation in the rulemaking process. *See* Cal. Gov. Code § 11346 et seq. (15d3-064.7)

Comment: First, the proposed changes to Subsection 95482(h) in title 17 of the California Code of Regulations (CCR) would increase production of fossil hydrogen paired with carbon capture and storage (CCS), resulting in increased emissions of greenhouse gases (GHGs) and other pollutants. These significant changes are inconsistent with California's climate, air quality, and equity goals, exceed the scope of the OAL decision, and contradict Board Resolution 24-14. They also require CARB to both readopt the regulations under the California Administrative Procedure Act (APA) and to evaluate new impacts under the California Environmental Quality Act (CEQA). The OAL did not require these substantive changes to LCFS hydrogen policy, nor did the Board authorize staff to make them at this juncture. **As a result, CARB must either reject the proposed changes to Subsection(h) or readopt the regulation after conducting additional environmental review.** (15d3-064.2)

Comment: If CARB does not reject the proposed changes to Subsection 95482(h), the California Administrative Procedure Act requires it to readopt the regulation.

Under the APA, if CARB makes new, significant changes to a regulation in response to OAL's disapproval, CARB must readopt the regulation. Cal. Gov. Code § 11349.4 (a). In relevant part, Subsection 11349(a) of the California Government Code provides that "[i]f the regulation has been significantly changed… the agency shall comply with Article 5 (commencing with Section 11346) and readopt the regulation." Id.

First, the proposed changes to Subsection 95482(h) are significant within the meaning of Subsection 11349.4 (a) because they substantially alter the limits placed on fossil fuel-derived hydrogen in the LCFS. As detailed above in Section I, these changes will impact LCFS credit generation for fossil hydrogen paired with CCS and adversely impact the environment and human health in numerous ways. (15d3-064.6)

Agency Response: No changes were made in response to this comment.

Please see response to comment J-1.1 for explanation of the basis for the proposed Third 15-day modifications to subsection 95482(h), including explanation that the modifications are consistent with the objectives of the rulemaking and California's decarbonization goals and policy. Although the modifications to subsection 95482(h) were not proposed in response to suggestions from OAL, these modifications are consistent with Government Code sections 11346.8 and 11349.4 because they are sufficiently related to the noticed regulatory action and do not significantly change the regulation. Rather, the proposed changes further improve alignment with the objectives of the rulemaking, as laid out in CARB's notice package and more fully discussed in response to comment J-1.1.

CARB has also determined that the proposed modifications to Subsection 95482(h) do not involve any changes that result in any new significant adverse environmental impacts or a substantial increase in the severity of the significant adverse impacts previously disclosed in the Final EIA. For additional analysis, please see the CEQA addendum in Attachment B to Executive Order R-25-001.

J-2 Multiple Comments: *Support Inclusion of Hydrogen with CCS*

Comment: The Associations also support allowing hydrogen produced with accompanying carbon capture and sequestration ("CCS") technology ("blue" hydrogen) to contribute to the renewable hydrogen requirements under the LCFS. (15d3-015.3)

Comment: CFCA appreciates...improvements…included "blue hydrogen" (natural gas with CCS) as an eligible production pathway. (15d3-021.3)

Comment: CHBC strongly supports the proposed modification of 95482(h) to allow hydrogen paired with carbon capture and storage (CCS) to count toward the 80% renewable hydrogen requirement by 2030 and the exclusion of hydrogen produced with accompanying carbon capture and sequestration technology from the existing phase out of fossil hydrogen by 2035. These modifications respond to requests we made in commenting on previous versions of the rule, which we appreciate, as hydrogen production paired with CCS is a zero-carbon solution. This should significantly expand hydrogen production, which will facilitate cost reduction of hydrogen prices, and support the sector's growth. CARB acknowledged the need for significant growth of the hydrogen market in the 2022 Scoping Plan, stating the need for 1,700 times the amount of hydrogen available to meet the state's carbon neutrality goals. This change also aligns with the Biden Administration's revisions for eligibility for the 45V hydrogen production tax credit, which recognizes the value of low-carbon intensity hydrogen. (15d3-028.1)

Comment: In earlier rulemaking packages, staff proposed to add a new subsection 95482(h) to remove LCFS credit generation eligibility for hydrogen produced using fossil gas as a feedstock. Staff is now proposing edits that would allow for hydrogen produced with accompanying carbon capture and sequestration (CCS) to count as renewable hydrogen. Kern appreciates this newly incorporated recognition of the benefits and strategic importance of layering CCS in hydrogen production to achieve climate goals. (15d3-042.2)

Comment: As we have previously stated, we support efforts to expand carbon capture and sequestration (CCS) in California and the role of the technology in California's climate change policies. We support clarification around the renewable hydrogen provisions, including that biomethane and other renewable pathways should apply to non-CCS hydrogen pathways. We urge CARB to work through implementation to ensure biomethane is utilized in relevant hydrogen pathways (e.g., steam methane reformation processes) to ensure these goals are met and California advances its renewable hydrogen goals. (15d3-044.6)

Comment: We strongly support the revised provision 95482(h) to recognize emission reductions associated with carbon capture & sequestration (CCS) as eligible in the context of the 2030 and 2035 renewable hydrogen provisions. This change will send an important market signal to decarbonize fossil-based hydrogen as renewable hydrogen production develops concurrently and recognizes the importance of all substantive decarbonization strategies. This amendment also promotes more low-carbon hydrogen supply for the California market and helps bring down the costs to the consumer. (15d3-048.2)

Comment: CRC supports CARB's proposed amendment to Section 95482(h) of the Low Carbon Fuel Standard Regulation (LCFS Regulation). The availability of LCFS credits for hydrogen produced with accompanying carbon capture and sequestration (CCS) technology is critical to the advancement of California's climate, economic, and energy goals; as it will enable the production of hydrogen that meets both criteria critical to the successful transition to renewable fuels at scale: (i) the ability to produce volumes necessary to meet statewide demand and (ii) consumer affordability. Existing incentives have proven insufficient to attract

the capital investments required to develop hydrogen infrastructure in California, without which development at scale is unlikely to occur in the state.

Specifically, if adopted, the proposed amendment to Section 95482(h) will provide an economic rationale for investors to underwrite hydrogen projects, releasing the financing required for project development. The availability of LCFS credits for hydrogen produced with accompanying CCS technology has the potential to drive billions of dollars of private investment in hydrogen production in the state. Additionally, the adoption of the proposed amendment to Section 94582(h) could lead to the creation of high-quality construction jobs and long-term operations jobs, many of which will be paid in accordance with the prevailing wage requirements under Sections 45Q and 45V of the U.S. Internal Revenue Code of 1986, as amended. (15d3-065.1)

> **Agency Response:** No changes were made in response to these comments. Staff appreciates commenters' support for the changes.

J-3 *General Support*

Comment: We appreciate CARB's…continued commitment to refining and implementing the HyCap model developed by NREL. (15d3-076.3)

> **Agency Response:** No changes were made in response to this comment. Staff appreciates the commenter's support.

J-4 *CI for Hydrogen with CCS should Include Enhanced Oil Recovery Emissions*

Comment: The fossil fuel industry may use the carbon dioxide captured at hydrogen production facilities for enhanced oil recovery (EOR). Using carbon dioxide for EOR contravenes California's climate goals by stimulating oil production, yet the LCFS' carbon accounting for hydrogen produced from fossil fuels with CCS does not account for its contributions to the supply of petroleum. (15d3-064.5)

> **Agency Response:** No change was made in response to the comment. The eligibility of CO_2-enhanced recovery (CO_2-EOR) as a reservoir for the purpose of CO_2 sequestration and credit generation is established in the LCFS Carbon Capture and Sequestration (CCS) Protocol incorporated by section 95490 of the regulation. Changes to the CCS protocol itself are outside of the scope of this rulemaking.

J-5 Multiple Comments: *Allow Additional Forms of Hydrogen*

Comment: Allow alternative compliance options or extended timelines for fossil-based hydrogen production in the early stages of market growth. Consider graduated CCS requirements that reflect technology and cost developments over time, rather than fixed 2030 and 2035 thresholds. (15d3-021.5)

Comment: Regarding hydrogen fuel requirements, it is crucial that the minimum percentage of renewable hydrogen is cost competitive…Therefore, we strongly suggest that the renewable hydrogen percent requirement be limited to a level that would reduce the carbon intensity of hydrogen to zero, achievable with a 33 percent renewable hydrogen blend (depending on the source of the biogas). (15d3-022.2)

Comment: CARB should retain a technology-neutral approach to the LCFS program by removing restrictions for certain hydrogen-based fuels (15d3-038.6)

Comment: Nonetheless, these new provisions do not go far enough and continue to pick winners and losers (e.g., other fossil fuel-based hydrogen production) rather than allowing space for innovation and inclusive solutions.

CARB has consistently acknowledged the need for advanced technologies and a broad portfolio of fuels to meet the state's climate goals, so it is imperative that policy and associated regulatory frameworks remain technology-neutral and open to emerging innovation. The elimination of crediting for fossil hydrogen produced without CCS is short-sighted and stifles innovation by eliminating other technological advancements before they can be realized. California cannot rely on the forecasted operational timeline for projects funded under the hydrogen hubs grants to meet hydrogen demand post-2030, particularly while uncertainty looms over the future of federal funding.

The production of fossil hydrogen with other advanced technologies that reduce carbon intensity should be seen as a positive contribution to expanding the supply of low-carbon hydrogen in California. Refineries co-produce hydrogen within the process of naphtha reforming. This co-produced hydrogen can be separated from other refinery gases and used to produce energy without producing any additional emissions. The co-production of hydrogen from naphtha reforming is distinct from other hydrogen production processes, such as steam methane reforming (SMR), which specifically targets hydrogen as the main product of the process. Co-produced hydrogen would have no associated greenhouse gas emissions as the carbon intensity would be allocated to the reformed naphtha used to produce gasoline.

Kern is actively working on an advanced technology that would capture this co-produced hydrogen for use in on-site fuel cells to produce low-CI electricity. Preserving crediting opportunities within LCFS would maintain the option of dispensing co-produced low-CI hydrogen as a transportation fuel. 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. (15d3-042.3)

Comment: 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.

At the time of the initial adoption of LCFS update in November 2024 there was considerable uncertainty about how the new Federal Administration would alter, hinder or otherwise stop the incentives made available by the Inflation Reduction Act. Subsequently, we have witnessed the Federal Administration pause all support for incentive programs in the near-term, including to Hydrogen Hubs that had already been identified for funding by the prior Administration, and we fear this will become a permanent pause. As a result, the need to focus California policy to deliver the right demand signals for renewable hydrogen production is now more important than ever.

In the consideration of alternative fuels, specifically non-fossil fuels, CARB should focus on developing strong demand signals as it lays out its regulations. This should be a key driver for the design of the LCFS, 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 are critically important to deeply decarbonize hard to abate sectors including some of the hardest 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 multimegawatt 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 incentives to utilize renewable hydrogen as an input to transportation fuels for the maritime and aviation sectors. (15d3-078.2)

Agency Response: No changes were made in response to these comments.

See Agency Response to J-1.1 for further information about changes staff made to FSOR Appendix A Agency Response O-1 to align with the modifications included with the Third 15-Day Notice.

J-6 *Remove Restrictions on Hydrogen*

Comment: CFCA remains concerned about the requirement that fossil-based hydrogen be paired with CCS to remain eligible after 2030 and 2035, as CCS technology remains prohibitively expensive and geographically limited…**High upfront costs and limited access to CCS infrastructure:** CCS remains prohibitively expensive and geographically limited. According to a 2023 study, a typical CCS project injecting approximately 1 million metric tons of CO_2 per year—using 3 injection wells and 1 monitoring well—has a **capital cost just under $100 million**, with operating costs averaging $8 per metric ton of CO_2. Most hydrogen producers—especially those trying to enter the market—are not in a position to finance or access this technology at the required scale within the proposed timelines.

> **Delays in hydrogen infrastructure buildout**: Hydrogen refueling stations and production hubs are still in early phases of deployment. Tying future eligibility to CCS requirements risks delaying or stalling these projects, especially among early adopters who are not vertically integrated.
>
> **Affordability and adoption barriers**: The added cost of CCS will likely be passed down the value chain, raising the price of hydrogen fuel. This will make it less attractive for fleets, limiting widespread adoption at a time when we need more commercial use to achieve emissions goals. (15d3-021.4)

Comment: CARB Must Ensure That the LCFS Revisions Accurately Account for Hydrogen Production CI Scores.

WSPA had previously expressed concerns that the second proposed 15-day amendments would effectively ban LCFS from crediting hydrogen produced using fossil natural gas as a feedstock and assign any volumes of such hydrogen the default ultra-low sulfur diesel (ULSD) CI beginning in 2031. This constraint ran counter to CARB's 2022 Scoping Plan Update, as hydrogen must play a critical role in achieving California's ambitious carbon neutrality by 2045 goal. Yet the third 15-day amendments retain the proposed use of the ULSD CI factor regardless of technological advancements that reduce the CI of fossil-based hydrogen: §95482(h) would require qualifying hydrogen beginning in 2030 to be from 80% renewables, hydrogen with carbon capture, utilization and sequestration technology, or a combination thereof (increasing to 100% in 2035) – or be assigned a ULSD CI from Table 7-1. Replacing a calculated hydrogen CI with the ULSD CI lacks a scientific basis and arbitrarily penalizes fossil-based hydrogen, foregoing potential GHG emissions reductions. Similarly, CARB's proposal to apply an Energy Economy Ratio (EER) value of "1" for hydrogen technologies that go into fuel cells that have an EER value greater than 1 artificially gives preferential treatment to certain technologies. Traditional hydrogen is projected to become a deficit generator under these proposed revisions, even though it represents a lower-carbon alternative to ULSD. 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. Rather than artificially lowering the CI score of traditional hydrogen or prescribing specific technologies for participation, the LCFS should continue to allow hydrogen to participate based on a calculated, science-based CI score. (15d3-038.19)

Comment: Kern again urges CARB to reconsider the addition of subsection 95482(h), which imposes restrictions to hydrogen crediting, in favor of a more comprehensive, inclusive

approach to ensure the state can meet the hydrogen needs of a clean energy future. (15d3-042.1)

Agency Response: No changes were made in response to these comments. Please see Agency Response to J-1.1 and FSOR Appendix A Agency Response O-1 (as superseded by the Third 15-Day removal of the phase-out of fossil hydrogen with CCS as explained in J-1.1) for further information.

J-7 *Fossil Hydrogen with CCS and Renewable Hydrogen should not be Grouped*

Comment: This [Modifications to § 95482] approach aligns with the LCFS' existing focus on carbon intensity, rather than production characteristics, as the primary metric by which fuel pathways are assessed, however it would put the program out of step with other State and Federal policies, as well as several other provisions within the LCFS.

Multiple policy frameworks adopt a clear distinction between renewable and non-renewable sources of energy, including, and of particular relevance to the LCFS, the Federal Renewable Fuel Standard (RFS), and the State Renewable Portfolio Standard. Both policies distinguish between fossil fuels, for which the supply is finite and non-renewable over policy-relevant timescales, and renewable fuels such as wind, solar, and biomass (or biomass only in the case of the RFS), that can be used over many years without depletion. The LCFS focuses on life cycle carbon intensity as its primary metric for evaluating fuel pathways, however it offers differing treatment to renewable pathways in several critical ways. For example, renewable electricity generation like wind or solar is assumed to have a carbon intensity of zero (despite ample evidence from life cycle assessment literature that there is a small, but non-zero GHG impact from such sources), rather than going through individual pathway certification like other fuels. To the extent that the proposed changes would extend treatment typically reserved for renewable energy systems to a non-renewable one, it may add complexity to the challenge of navigating California's climate policy portfolio.

There are meaningful technical and operational differences between hydrogen production from electrolysis of renewable electricity, and that made by SMR with or without CCS. Appropriately designed, permitted, operated, and regulated SMR+CCS systems can reduce GHG emissions compared to conventional SMR. However, they are subject to operational constraints like access to geological sequestration sites, and dependence on large quantities of inexpensive methane (e.g., fossil "natural" gas). Similarly, their use is associated with a different slate of environmental impacts and risk factors - e.g., fugitive methane leakage or CCS well failure - that do not apply to electrolytic hydrogen production. These differences must be recognized and appropriately considered if these approaches to GHG reduction can be leveraged to maximize their potential value. The proposed revisions in this section would allow SMR of fossil gas with CCS to be counted against a requirement for "renewable" approaches to hydrogen production, which could constrain the ability of the LCFS, or regulatory programs that adopt the LCFS' approach, to recognize and appropriately reflect the meaningful differences between SMR+CCS systems and electrolytic ones (or other renewable approaches to hydrogen production). Maintaining the distinction may be important for LCFS or other climate policies to provide levels of support to each method that are proportional to the GHG or other environmental benefit they provide. Weakening the incentive for non-fossil sourcing for hydrogen production could lead to the risk of stranded assets in the future, given California's commitment to move away from fossil fuel use as much as possible. (15d3-081.1)

Agency Response: No changes were made in response to this comment. The proposed modifications do not expand the definition of "renewable hydrogen" to include fossil hydrogen with carbon capture and sequestration. Instead, the modifications remove restrictions on LCFS crediting for low carbon intensity fossil hydrogen with CCS as a means of ensuring investment and development in hydrogen production and distribution and in CCS technology to align with the 2022 Scoping Plan Update. See Agency Response J-1.1 for further information.

K Zero Emission Vehicle (ZEV) Infrastructure

K-1 *Support for Heavy-Duty Fast Charging Infrastructure (HD-FCI)*

Comment: The HD-FCI provision addresses utilization risks in the early market phases, helping solve the "chicken or egg" dilemma that currently hinders infrastructure deployment, and the 15-Day Changes appropriately clear up lingering uncertainty highlighted by OAL around geographic restrictions for this provision. (15d3-070.1)

Agency Response: No changes were made in response to this comment. Staff appreciates the commenter's support for the proposed amendments.

K-2 Multiple Comments: *Heavy-Duty Hydrogen Refueling Infrastructure (HD-HRI)*

K-2.1 Multiple Comments: *Support HD-HRI Derating Factor Modification*

Comment: Specifically, the Associations applaud the Agency for proposing to modify the HD hydrogen refueling infrastructure ("HRI") program by … (ii) adjusting the proposed derating factor for hydrogen refueling stations. (15d3-015.2)

Comment: FirstElement Fuel (FEF) appreciates your and your staff's continued work in incorporating many of the comments from our industry, in particular, the increase of the heavy-duty Hydrogen Refueling Infrastructure (HD-HRI) derating factor from 50% to 62.5% to more accurately represent the credits for building large stations. (15d3-017.1)

Comment: CFCA appreciates CARB's continued recognition of hydrogen as a key part of California's low-carbon future and acknowledges several important improvements in the proposed LCFS amendments:

- Lowered the derating cap for the Heavy-Duty Hydrogen Refueling Infrastructure (HD HRI) program (15d3-021.1)

Comment: We appreciate CARB's upward revision of the HD HRI capacity factor to 62.5%, a reasonable improvement from the prior 50% (15d3-076.2)

Agency Response: No changes were made in response to these comments. Staff appreciates the commenters' support for the proposed amendments.

K-2.2 Multiple Comments: *Support Removing 1.5x CapEx Limit*

Comment: Notably, we commend the removal of the HRI credit generation cap based on station capital expenditure for both the LMD and HD HRI programs, as well as the increase in the derating factor for public HD-HRI from 50% to 62.5%. We believe these revisions enhance the flexibility and predictability of the LCFS program, helping to better incentivize private investment in zero-emission vehicle (ZEV) infrastructure. (15d3-013.1)

Comment: Specifically, the Associations applaud the Agency for proposing to modify the HD hydrogen refueling infrastructure ("HRI") program by (i) removing the restrictions on revenue generated through credits (tied to capital expenditure); (15d3-015.1)

Comment: We also appreciate removal of the 1.5 times cumulative capital expense cap, which was counterproductive to the intent of the capacity credit goals and building stations before vehicle deployment. (15d3-017.2)

Comment: CFCA appreciates CARB's continued recognition of hydrogen as a key part of California's low-carbon future and acknowledges several important improvements in the proposed LCFS amendments:

…

- Removed the revenue cap on HD HRI stations (15d3-021.2)

Comment: CHBC also supports the proposal to remove language that limits the estimated cumulative value of Hydrogen Refueling Infrastructure (HRI) credits generated by a station to 1.5 times capital expenditure in sections 95486.3(a)(4)(H) and

95486.4(a)(4)(I). This is another modification we requested and are pleased to see included in this round of adjustments. By eliminating the 1.5X cap, the Hydrogen Refueling Infrastructure program will become more aligned with its purpose of supporting early-stage infrastructure development and long-term market growth. It will 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. (15d3-028.2)

Comment: § 95486.3(a)(4)(H) and § 95486.4(a)(4)(I) – Removal of 1.5x CAPEX Recovery Limit for Both HRI Pathways

We strongly support CARB's decision to eliminate the cap on credit generation at 1.5 times capital expenditure (CAPEX) for both light- and medium-duty (LMD) and heavy-duty (HD) hydrogen refueling infrastructure (HRI) pathways.

This restores the self-regulating nature of the HRI program, providing much-needed investment certainty for stations that must be operational ahead of vehicle demand. (15d3-076.1)

> **Agency Response:** No changes were made in response to these comments. Staff appreciates the commenters' support for the proposed amendments.

K-2.3 *Oppose Distance Requirements for HD-HRI*

Comment: In subsection 95486.4(a)(1)(B)(1), staff proposes to clarify that the five-mile distance requirement for shared HD-HRI stations will be calculated based upon the shortest great-circle distance between the proposed site and an Alternative Fuel Corridor. We find this to be a missed opportunity. The requirement that HD-HRI stations must be located within five miles of any Federal Highway Administration (FHWA) Alternative Fuel Corridor is highly restrictive and overlooks critical freight routes such as drayage routes. This requirement could inadvertently limit the redundancy of the fueling network and eliminate high traffic points in the freight system which are essential for reliable service. There is no sound rationale for this restriction. While many refueling activities occur near freight corridors,1 not all refueling is near freight corridors, and refueling should not be constrained by proximity to these corridors. CARB

staff currently has the authority to accept or reject HRI credit applications, which should be based on the merits of each proposal rather than an arbitrary distance requirement. For example, the Otay Mesa border crossing—one of the busiest freight corridors—is not within five miles of a designated clean corridor, yet it sees over a million truck crossings annually. This is a clear example of how such a rule could undermine the strategic placement of HRS. We recommend Executive Officer discretion on requirements for HD-HRI station placement outside of the five-mile limit. (15d3-028.4)

> **Agency Response:** No changes were made in response to this comment. The clarification of the five-mile distance requirement in subsection 95486.4(a)(1)(B)(1) is responsive to item 1.22 in OAL's Decision of Disapproval. The vast majority of stretches of Alternative Fuel Corridors are within 5 miles of existing electrical transmission lines, allowing the construction of hydrogen refueling stations nearby and helping to minimize additional utility connection costs. Proximity to Alternative Fuel Corridors remains an important aspect of developing a hydrogen fueling network.

K-2.4 *Remove Cost and Revenue Recordkeeping and Reporting Requirements*

Comment: With removal of the capital expenditure-based credit value limitations in Sections 95486(a)(4)(H) and 95486.4(a)(4)(I), we request CARB also eliminate Sections 95486.3(a)(6)(C) and 95486.4(a)(6)(C) and related sub-sections from the LCFS regulation. These sections address cost and revenue recordkeeping and reporting for LMD and HD and are only relevant to the capital expenditure-based credit value limitations proposed to be eliminated, respectively. This is highly competitively sensitive information which should not be collected if it is no longer required for the regulation. (15d3-048.6)

> **Agency Response:** No changes were made in response to this comment. Cost and revenue recordkeeping has been required since the first iteration of the HRI program, which also did not have a CapEx limit. CARB must and does protect confidential business information. The collection of this data is important to facilitate enforceability of these underlying regulatory provisions, as well as potentially for informing the development of future incentives and rulemakings.

K-3 Multiple Comments: *Light- and Medium-Duty Hydrogen Refueling Infrastructure (LMD-HRI)*

K-3.1 Multiple Comments: *Oppose LMD-HRI Derating Factor Modification*

Comment: On October 1, 2024, CARB released final modifications to the proposed amendments, increasing the public LMD station HRI capacity factor from 50% to 100%, a change that aligned with public comments from the hydrogen industry. However, in the Proposed Third 15-Day Changes to the Regulation Order, the capacity factor was reduced to 62.5%. This reduction negatively impacts the business case for LMD stations and poses a risk to the growth of the light-duty hydrogen vehicle market. Lowering the capacity factor may also undermine the original intent of the HRI program—to support stations as fleet demand increases over time. We respectfully urge CARB to restore the LMD-HRI capacity factor to 100%, which would strengthen investment incentives and help accelerate the adoption of hydrogen-powered vehicles in California. (15d3-013.2)

Comment: There are two critical issues that remain, however, that will similarly derail our efforts to deploy stations. These two issues are prohibiting individual applicants from HRI if

they exceed 1% of deficits and the derate applied to the light- and medium-duty HRI (LMD-HRI). (15d3-017.3)

Comment: The revised language includes an increase of the HD-HRI derate from 50% to 62.5%, based on industry requests. This is a welcome change, however, the same derate is now applied to LMD HRI with a maximum station capacity remaining at 1,200 kg/d. This makes the available LMD-HRI credit only 750 kg/d, which encourages smaller not larger stations. As we had pointed out in our first 15-day comment letter, these neighborhood stations need to be larger to accommodate fuel cell pickup and work trucks being deployed by the end of the decade by the automakers. CARB staff had changed the maximum crediting for LMD HRI to 1,200 kg/d in the 2nd 15-day notice. It is unclear why you have now gone back to a lower crediting amount unless there was an inadvertent omission of changing the maximum station capacity to 2,000 kg/d as was in the first 15-day notice. We urge CARB to remove the derate for LMD-HRI or make the maximum capacity 2,000 kg/d to incentivize larger stations.

We appreciate CARB staff's work on enabling zero-emissions transportation technologies, and our company was built to enable these same goals through infrastructure. However, constraining successful applicants within the HRI program and shrinking the LMD stations will not achieve the desired outcome of more ZE transportation and will actually have the opposite effect. (15d3-017.4)

Comment: In 95486.3(a)(2)(F), staff proposes to modify the derating factor for light, medium and heavy-duty (HD) HRI. The revised language includes an increase of the HD-HRI derate from 50% to 62.5%, and the same derate is now applied to light-and medium duty (LMD) HRI with a maximum station capacity remaining at 1,200 kg/d. This makes the available LMD-HRI credit only 750 kg/d, which encourages smaller, not larger, stations. These neighborhood stations need to be larger to accommodate fuel cell pickup and work trucks being deployed by the end of the decade by participating auto OEMs. CARB staff had changed the maximum crediting for LMD-HRI to 1,200 kg/d in the 2nd 15-day notice. It is unclear why this proposal reverts to a lower crediting amount unless there was an inadvertent omission to change the maximum station capacity to 2,000 kg/d as was in the first 15-day notice. We urge CARB to remove the derate for LMD-HRI or make the maximum capacity 2,000 kg/d to incentivize larger stations. Further, we do not see the need for a derating factor for either LMD or HD HRI investments. (15d3-028.3)

Comment: However, the newly introduced cap on LDV capacity of public 62.5%, private 31.5% will encourage smaller scale station creation, which we assume is not what the market envisions. The new 2024 changes have included Medium Duty to the Light Duty HRI which should entail more volume requirements than the previous Light-Duty vehicle only regulation. To support the over 18,000 FCV on the road and future work trucks/fuel cell pick-ups come to the market at the end of the decade, this current regulation would hinder the growth for demand. Thus we encourage CARB to reconsider to ***keep the original proposal in the final language submitted to OAL office in January (which has 100% for public station and 50% for private station as a factor)*** on LMD-HRI or increase in station capacity threshold to 2,000 kg/d in case currently proposed factors are maintained. (15d3-057.1)

Comment: This change reduces the maximum LMD HRI crediting from 1,200 kg/day to 750 kg/day under the 62.5% de-rate. It is unclear to CHC if this was an unintended change and would oppose the proposed edits to the capacity factor of LMD station capacity credits. Politics and uncertainty have stalled capital markets on decarbonization activities and regulatory changes like the derate to the LMD HRI credits will add additional headwinds to California's zero-emission vehicle goals.

CHC has been consistent in our request to maintain the existing 1,200 kg/day capacity in the LMD credit and worked with CARB to fix this when a 50% capacity factor was introduced in the 45-day draft. “MD vehicles typically require larger stations, and their integration with LD fleets, as opposed to heavy-duty (HD), underscores the importance of incentivizing larger stations. Larger stations, proven to be more reliable, better align with California's policy goals and the current market dynamics.1” We worked diligently with staff to fix this issue, and the 2nd 15-day changes provided the appropriate policy and market signal. It is unclear why this changed again.

The 3rd 15-day notice change to the LMD capacity factor discourages the construction of larger and more reliable stations at a time when auto manufacturers are planning to bring medium-duty fuel cell electric vehicles to market, which will require higher throughput infrastructure. Applying the same de-rate across both LMD and HD stations ignores the capital and operational differences and undermines investment in the only hydrogen infrastructure built without state grants. CARB should seek to incentivize larger stations that accelerate vehicle uptake pursuant California’s goals and drive cost reductions. The LMD HRI pathway as proposed will not support California’s ambitious goals or the vehicle types that these stations need to serve. (15d3-076.5)

> **Agency Response:** No changes were made in response to these comments. Pursuant to Board Resolution 24-14, staff will monitor hydrogen refueling availability during implementation of the proposed amendments and may propose future changes as necessary. Comments related to applicants being limited to 1% of deficits are outside the scope of the Third 15-Day package.

K-4 *Oppose Removal of 1.5x CapEx Limit*

Comment: Supporting the deployment of ZEV fueling infrastructure in advance of vehicle fleet transformation aligns with best practices suggested by current research in this space.5 However, it is not clear why the cap was removed for HRI but not FCI; the differing treatment of two generally similar forms of ZEV fueling infrastructure may cause confusion among stakeholders. We note that the Office of Administrative Law did not identify issues related to the per-station cap on HRI revenue as problematic or needing clarification in their decision to return the proposed amendments for additional clarification. As such, we question why this change in policy was suggested at this late phase of the rulemaking, after the board had considered and voted to approve the amendments on November 8th.

In addition to the potential confusion resulting from these changes, they may lead to a small handful of projects claiming a disproportionate share of infrastructure capacity credits, resulting in credit revenue flowing in ways that do not support California’s ZEV goals. The total number of HRI and FCI credits are each capped at a quantity equal to 2.5% of prior year deficits in any given year, if issued and anticipated HRI and FCI credits would exceed that cap, no new pathways in the category exceeding the cap would be approved. That is to say, if the HRI program is utilized to its fullest extent and supports enough stations to reach the cap, then no additional stations can take advantage of the HRI provisions within that category for a given year. Imposing the 1.5x capital cost cap on total HRI revenue helped ensure that the HRI program would be able to support a greater number of stations, and support the State’s goals around widespread ZEV fueling infrastructure availability. If a low utilization station had received total credit value that exceeded the limits as described above, they would effectively be removed from the program and the space under the cap that station had previously occupied would be freed up for another station. This helped ensure that the HRI and FCI provisions supported the deployment of a large number of stations, and created a strong

incentive to increase the utilization of existing stations. The changes proposed in the 3rd 15 day package would allow stations to continue receiving HRI credits for the full duration of these provisions and potentially exclude new stations from taking advantage of these provisions.

Beyond this, there is no clear reasoning given why a particular station should receive capacity credits in excess of the difference between capital cost and received grant or incentive revenue. No analysis was presented in the ISOR or any associated LCFS documents that we could find during the rulemaking process that justified this level of support as being necessary or appropriate for the purpose of expanding ZEV refueling infrastructure. Providing 1.5 times the capital cost (less other incentives) offers a sizable incentive for the provision of this type of ZEV fueling infrastructure, considering that such stations will also receive revenue from regular LCFS credits, RFS incentives, sale of fuel and possibly other sources. Work by ITS-Davis researchers (though conducted while at a previous institution) evaluated the projected revenue available to light-duty HRI and FCI stations and demonstrated that these could plausibly receive capacity credits with total value at several multiples of station capital cost.

Without additional analysis or justification, it is difficult to understand how or why this level of incentive is appropriate for the purpose of supporting ZEV fueling infrastructure expansion. The analysis and concerns presented in that 2018 letter have never been clearly addressed by CARB or related stakeholders; we still lack a transparent statement of capital and operational costs for the types of stations the HRI and FCI provisions seek to support, and cannot evaluate whether the level of support provided by these provision is appropriate or efficient. Unrestricted HRI or FCI crediting could lead to windfall profits for the station developer, in which a low-utilization station could receive substantial credit revenue, potentially in the hundreds of thousands of dollars per year, derived predominantly from charges on petroleum gasoline paid by California consumers, even after the station has fully recouped investment and operational costs. Removing this cap without analysis or justification increases the risk that significant amounts of LCFS credit revenue will be spent in ways that provide little benefit to either California's long-term decarbonization goals or the Californians themselves. (15d3-081.3)

> **Agency Response:** No changes were made in response to this comment. The removal of the CapEx limit allows continued support of hydrogen stations for the full 10-year crediting period. This ensures an income stream for hydrogen refueling stations in case the low demand for hydrogen exhibited in the original HRI program continues for the LMD-HRI and HD-HRI programs. It is critical for the establishment of FCEV fleets that the next round of hydrogen refueling stations built remain in place and operating for a fixed period of time. The increase in crediting capacity from 50% to 62.5% helps compensate the reduction in the crediting period from 15 years in the current regulation to the proposed 10 years to better match hydrogen industry expectations for future infrastructure credit generation. Limits still remain on the total size of the HRI provision, as well as how much LCFS crediting share any particular company can have. These changes overall help to advance the LCFS program's goal to strengthen support for ZEV infrastructure.

K-5 *Eliminate CapEx and Adjust Derating Factors for FCI*

Comment: Given the federal threats to EV support, CARB should enhance credit generation for EV charging infrastructure.

CARB's landmark zero-emission vehicle (ZEV) rules—vital pieces of California's strategy to meet air and climate goals—are under unprecedented attack. As the Trump administration takes steps to rescind California's Clean Air Act waivers,45 deny approval of future waivers,46

and slash federal funding,47 CARB must increase support for battery EVs. The need for this support was evident when the Board voted on the LCFS amendments, and it is even more apparent now, given the federal assault on bedrock climate and clean air laws.

Despite the central importance of battery EVs, California's commitment to them, and the growing threats to their deployment, CARB staff fails to propose enhancements to EV fast charging infrastructure (FCI) crediting even though it proposes increased crediting for hydrogen refueling infrastructure (HRI).48 FCI is already disadvantaged in the LCFS program, and this proposal would exacerbate the uneven playing field. CARB must correct this unjustified asymmetry and boost FCI crediting at this critical time.

First, CARB should eliminate the capacity crediting cap (of 1.5x the CapEx) for FCI to provide developers with greater investments certainty. Removing credit limits would signal CARB's commitment to maintaining infrastructure growth and California's commitment to its ZEV goals, especially in a time of regulatory and federal financial uncertainty. CARB staff proposes to remove this cap for HRI, and there is no basis for withholding such a change for FCI.

Second, CARB must make the arbitrary derating for FCI at least at parity with the HRI stations, allowing for continued investment even under the significant uncertainty of the Advanced Clean Trucks rule and potential slower EV adoption due to the revocation of the Advanced Clean Fleets waiver request. Staff's current proposal increases the credit generation factors for HRI (from 50% to 62.5% for shared stations and from 25% to 31.5% for private stations) but inexplicably leaves the FCI factors unchanged (i.e. 20% for shared and 10% for private charging).50 CARB provides no explanation for why the specific increases were chosen, nor any evidence or analysis justifying that HRI needs more support than FCI. CARB claims that "through the public engagement process, stakeholders have confirmed that 6,000 kg/day, derated to 50% of the nameplate capacity, provides sufficient incentive for MHD-HRI stations,"51 whereas no such confirmation was made from FCI stakeholders. In fact, FCI stakeholders noted that the HD FCI provisions help address "utilization risks in the early market phases" even with such regulatory requirements of the Advanced Clean Trucks and Advanced Clean Fleets rules.52

CARB's unjustified preference for hydrogen refueling over EV charging is puzzling and troublesome given the overwhelming evidence shows that battery EVs will do almost all of the work cleaning up California's transportation sector. CARB's own estimates show electricity will power 88% of the zero-emission transportation energy demand through 2045, far exceeding the contribution of hydrogen fuel cell vehicles.53 CARB cut its own hydrogen fuel cell vehicle projections by two-thirds (from 62,600 to 20,500)54—even before potential federal rollbacks 15 were identified.55 Other experts' most recent economic modeling has also shown that the role of hydrogen in surface transportation is likely to be very limited, as the costs of battery EVs decline more quickly than previously forecasted and hydrogen vehicle costs decline more slowly than anticipated.56 Further, even though EV adoption may be slower than what was expected with full enforcement of CARB's Advanced Clean Cars II, Advanced Clean Trucks, and Advanced Clean Fleets regulations, the data are clear: more consumers are purchasing EVs,57 and more infrastructure is needed. Indeed, the current level of EV infrastructure deployment (i.e. 179, 241 reported EV chargers) is less than 1/6 of what California Energy Commission (CEC) says is needed by 2030 (i.e. 1.01 million chargers). 58

It is also irresponsible for CARB to favor hydrogen fueling stations with special credit generation opportunities that are unavailable to EV charging stations because hydrogen fueling stations present unique stranded asset risks. In a 2023 fact sheet, CARB and CEC explained that "investments in hydrogen fueling infrastructure may become stranded assets" if

several barriers are not addressed.59 The agencies highlighted the need to transition to fully clean and renewable hydrogen production, lower hydrogen fuel prices so that they do not remain far above the costs of equivalent fuel for internal combustion engines (ICE) and battery electric vehicles, and improve the availability of fuel cell electric vehicle (FCEV) models.60 These factors do not pose similar risks to EV charging stations because (1) Senate Bill 100 created a process for transitioning their fuel to renewable energy, (2) fuel costs for EVs are already lower than fuel costs for ICE vehicles, and (3) manufacturers offer a broader range of battery electric models than FCEVs.

Given this robust evidence, CARB should appropriately boost FCI crediting to reflect the critical importance of battery EVs for California's energy transition and to counter federal threats to EV deployment and California's clean air and climate goals. Significant changes will require readoption of the regulation under the APA, and this process will provide CARB with an opportunity to consider additional evidence on the importance of LCFS support for EV deployment given the altered federal landscape. (15d3-064.8)

> **Agency Response:** No changes were made in response to this comment. The Zero Emission Vehicle Infrastructure Program exists to incentivize the establishment of infrastructure for electricity and hydrogen fueling. By providing a level of certainty for LCFS credit proceeds generated by the ZEV fueling sites, the ZEV Infrastructure Program helps electricity and hydrogen compete with other fuels that already have established infrastructure, such as gasoline and diesel. Hydrogen fuel stations have capital expenses larger than electricity, so a larger percentage of their fueling capability is guaranteed with ZEV infrastructure credits to help recoup those expenses in the same 10-year crediting period as fast chargers are. Moreover, hydrogen stations have experienced equipment issues that have required additional capital investment; removal of the CapEx limit for HRI helps mitigate the associated risk. Note also that, compared to the 2019 amended regulation, the percentage of credits guaranteed for the fueling capacity of larger fast chargers increased with the modification of FCI charging capacity equation, and increased again for heavy-duty chargers due to the increase in EER for the FCI credit calculation. A 350 kW HD-FCI charger is guaranteed more than four times the LCFS credits than an FCI charger in the current FCI program.
>
> Additionally, CARB continues to see a potential role for FCEVs in the future ZEV fleet, especially as the market evolves to reach the 100 percent ZEV sales goal of the ACC II program. The investments made through the Clean Transportation Program and the support provided by the LCFS program are critical pieces to the hydrogen fueling market in California. Fuel cell electric vehicle (FCEV) technology remains important for drivers who need frequent fast refueling and who do not have access to charging infrastructure and CARB staff are committed to continuing to address infrastructure challenges to expand the hydrogen fueling network so that larger numbers of consumers can reasonably and reliably choose to drive an FCEV as their ZEV of choice.

K-6 Multiple Comments: *General Support for HRI*

Comment: 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 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. (15d3-013.3)

Comment: Continue supporting infrastructure credits and incentives for early hydrogen investments that may not be CCS-ready but still contribute to decarbonization goals. (15d3-021.6)

Comment: We are generally supportive of the amendments proposed in the Hydrogen Refueling Infrastructure (HRI) crediting for both the light- and medium-duty (LMD) vehicle and the heavy-duty (HD) vehicle provisions. (15d3-048.3)

Comment: HD hydrogen refueling stations are significant investments and aligning commercial fleets with take-or-pay agreements to ensure a return on capital at this point in the market cycle is exceptionally challenging. The 3rd 15-day changes provide the right policy signal to station developers (certainty of credits generated under potentially adverse market conditions) and helps solve the chicken-and-egg scenario HRI is designed to avert. (15d3-076.4)

> **Agency Response:** No changes were made in response to these comments. Staff appreciates the commenters' support for the HRI program.

K-7 *Variable Specification in HRI and FCI Crediting Protocols*

Comment: The 3rd 15 day package makes several changes to proposals relating to HRI and FCI crediting protocols. Several equations are presented to describe the calculation of station capacity, projected capacity, and credit generation for each pathway. While the description of each equation is clear, consideration of the full package of equations is made difficult due to a lack of clarity in variable definition.

Take for example the HD-FCI charging protocols (though the same basic problem is observed in both LD/MD and HD HRI and FCI pathways): § 95486.4 (b) (2) (F) provides the equation

$$Cap^{i}_{FCI} = F^{site}_{HD} \times P^{i}_{FCI} \times 24$$

and states "Cap^{i}_{FCI} is the FCI charging capacity (kWh/day) for the HD-FCI FSE i".

Later, § 95486.4 (b) (5) states "Cap_{HD-FCI} is the FCI charging capacity (kWh/day) for the HD-FCI FSE. This means that both Cap^{i}_{FCI} and Cap_{HD-FCI} are described as representing the same parameter (we can ignore the *i* superscript for this discussion since it implies a numbered example within a set and is relevant to the specific context of § 95486.4 (b) (2) (F)). Similarly, it is unclear whether the use of Cap_{HD-FCI} in § 95486.4 (b) (5) means that the capacity credits should use the nameplate capacity of the infrastructure as the basis for credit generation, or the adjusted capacity which takes into account the p^{i}_{FCI} utilization factor applied in § 95486.4 (b) (2) (F). Clarity on these issues is needed for stakeholders to fully understand how infrastructure capacity crediting, and the assessment of potential credits in relation to prior year deficits, will proceed. (15d3-081.8)

> **Agency Response:** No changes were made in response to this comment. While Staff recognize the slight differences in variable names used to describe the same values in different equations, because each equation is independent of the others, there is sufficient clarity for the equations. Following an effective date for the amendments, CARB staff may produce updated HRI and FCI application templates and calculators to provide implementation support for applicants.

L Base Credits and the Clean Fuel Reward

L-1 *Support Removal of Base Credits for Original Equipment Manufacturers (OEMs)*

Comment: The California Utilities are supportive of the most recent changes made to the California Clean Fuel Reward (CFR) program, including … rescinding the option for the Executive Officer to redirect base credits from the CFR to OEMs. (15d3-020.3)

> **Agency Response:** No changes were made in response to this comment. Staff appreciates the commenter's support for the proposed amendments.

L-2 Multiple Comments: *Reinstate Base Credits for OEMs*

Comment: We were disappointed to see changes to CARB's Board-approved LCFS amendments that removed the option for automakers to earn up to 45 percent base credits. This allowance would have boosted EV adoption, which is especially important when adoption rates are waning, and state incentives such as the Clean Fuel Rewards program and Clean Vehicle Rebate Project are no longer available to consumers. Automakers are in the best position to repurpose the credit proceed, avoiding EV purchase stagnation by implementing programs that reengage prospective EV buyers. (15d3-022.1)

Comment: Kia supports comments submitted by the Alliance for Automotive Innovation (AFAI) that recommend modifying subsection (c)(1)(B) of subsection 95483 to direct the Executive Officer to allot 45% of base credits for residential electric vehicle charging to automakers (OEMs). The latest 15-day notice has removed any opportunity for revenue generated by light duty (LD) EVs to be used to promote the LD EV market. Kia opposes this change. Kia continues to strongly support CARB providing base credits to OEMs of LD EVs. Providing base credits to LD EV OEMs is a direct and effective way to advance electrification, and thereby reduce emissions of GHGs, in the transportation sector.

…

New proceeds from base credits will position Kia and other OEMs to increase their ability to provide customer rebates on EVs, reducing consumer-facing transaction prices, and increase investments in advancing EV infrastructure. Reduced EV transaction prices and accelerated EV infrastructure growth will serve to increase EV adoption and thereby the use of low-carbon intensity (low-CI) electricity as a transportation fuel. This is a double benefit to consumers as low-CI electricity is generally more affordable than gasoline and other liquid transportation fuels. (15d3-029.1)

Comment: We have continued 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 vehicles, since OEMs are in the best position to promote EV sales. Unfortunately, the latest 15-Day Notice has removed any opportunity for revenue generated by LD EVs to be used to promote the LD EV market. We oppose this change. Instead, to address the concern raised by the Office of Administrative Law (OAL) in its Decision of Disapproval,4 we recommend modifying subsection (c)(1)(B) of section 95483 to read:

> *Base Credits to OEMs*. The Executive Officer ~~may~~ shall 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 for all OEMs in California, based on data reported pursuant to that regulation. If the Executive Officer directs base credits to eligible OEMs, the requirements of section 95483(c)(1)(A)2. do not apply. The OEM is the credit generator for base credits for the portion of residential EV charging assigned to that OEM by the Executive Officer pursuant to 95486.1(c)(1)(A)1. The OEM must meet the requirements set forth in paragraphs (D)1. through 3. of this subsection 95483(c)(1) below, and 95491(e)(5).

Even with limited incremental LCFS credits, automakers have proven that the revenue generated is invested to advance electrification in California. Below is a sampling of projects that vehicle manufacturers have already invested in with LCFS funds.

- Installing DCFC stations in Baldwin Park and Sacramento.
- Subsidizing zero-emission car sharing fees for college students at California State University – Dominguez Hills.
- Returning proceeds directly to EV customers in the form of a digital Amazon gift card. At the peak of this program, nearly 4,000 customers were enrolled and received gift cards.
- Funding broader business initiatives like SmartCharge (a home charging demand response program for nearly 4,500 customers) and advancing technologies to help reach sustainability goals.
- Expanding the telematics capabilities of EVs to continue to evolve and innovate new energy management and charging solutions for our drivers.

Additionally, below are some examples of how vehicle manufacturers could use base credits to support electrification:

- Support mobility hub initiative at California State University – Dominguez Hills as part of LA28 Olympics.
- Support funding of hydrogen-based community car sharing initiatives in Central / Southern California.

Instead of eliminating the opportunity for OEMs to generate base credits, Auto Innovators would like to work with CARB to develop metrics, tied to the Advanced Clean Cars II ZEV mandate, that would have provided clear reasoning for directing base credits to OEMs. For example, if ZEV sales are less than 75 percent of meeting the ZEV mandate, OEMs could receive 45 percent of the base credits. The percentage of base credits to OEMs would go down as ZEV sales moved closer to the ZEV mandate. (15d3-034.2)

Agency Response: No changes were made in response to these comments. The removal of the option for the Executive Officer to direct a portion of base credits to OEMs is responsive to items 1.3 and 1.4 in OAL's Decision of Disapproval, and to Board direction provided at the Board Hearing on November 8, 2024. The removal of the base credits to OEMs option in the Third 15-Day modifications supersedes Agency Responses I-3 and I-4 (and the portions of responses I-5, I-7, I-8, and I-9 that reference those responses) in Appendix A of the FSOR released on January 3, 2025.

L-3 Multiple Comments: *Support Proposed Clean Fuel Reward/Rebate for Medium- and Heavy-Duty Fleets*

Comment: In place of allocating base credits to automakers, Rivian supports the EV purchase rebate for medium- and heavy-duty ("MHD") fleets and applauds the clarification in these

modifications that “high priority and federal fleets,” as defined for purposes of the Advanced Clean Fleets regulation, will be eligible. This rebate promises to be an important tool in accelerating the electrification of the MHD market. (15d3-006.1)

Comment: The California Utilities are supportive of the most recent changes made to the California Clean Fuel Reward (CFR) program, including removing the participation exclusion for High Priority and Federal Fleets (15d3-020.2)

Comment: Additionally, we support the clarification that “base credits” issued to electric distribution utilities are to be allocated to a statewide Clean Fuel Reward program for medium- and heavy-duty vehicles. This clarification addresses OAL questions and accurately reflects direction from Board Members as detailed in Resolution 24-14. (15d3-070.3)

Comment: We note that the proposed changes to this section extend the current treatment of a significant fraction of LCFS credit revenue from residential EV charging, which is largely used to fund incentives for MD and HD EV purchase. Given the withdrawal of the waiver application for the Advanced Clean Fleets (ACF) rule, there is a profound need for California to deploy additional support for MD and HD ZEV deployment; while the revenue from the LCFS is unlikely to yield the same net effect as ACF, it can contribute to a portfolio of policies that fill this gap. (15d3-081.2)

> **Agency Response:** No changes were made in response to these comments. Staff appreciates the commenters’ support for the proposed amendments.

L-4 Multiple Comments: *Oppose/Modify Proposed Clean Fuel Reward*

Comment: We oppose the changes related to light-duty (LD) vehicles and continue to recommend using funding generated by 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) and motorcycle EV projects.

In 2024, EV sales represented 26% of light-duty vehicles sales in California. Far more EVs must be sold 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 is not the case with the proposed changes that use LCFS proceeds from LD EVs to fund MD, HD, and motorcycle EV projects.

Comment: <u>Extend Clean Fuel Reward to Fuel-Cell Vehicles</u>

To help spur demand for hydrogen fuel-cell vehicles concurrently with battery-electric vehicles, particularly medium- and heavy-duty vehicles considering the pause on Advanced Clean Fleet implementation, and maintain the technology-neutral approach of the regulation, we suggest opening the Clean Fuel Reward program to all zero-emission vehicles. Fuel cell electric vehicles are electric vehicles, and should be included in the Clean Fuel Reward along with battery electric vehicles. (15d3-048.4)

> **Agency Response:** No changes were made in response to these comments. The focus of the Clean Fuel Reward on medium- and heavy-duty vehicles and zero-emission motorcycles (ZEMs) is responsive to Board direction in Resolution 24-14. For more information on this Board direction, see Resolution 24-14, which is available at: *https://ww2.arb.ca.gov/sites/default/files/barcu/board/res/2024/res24-14.pdf*. The

Third 15-Day modifications as reflected in this response supersede response I-17 in Appendix A of the FSOR released on January 3, 2025.

M Validation and Verification

M-1 *Support for Proposed Changes to Accuracy Requirements*

Comment: ACCURACY: SRECTrade supports the inclusion of the 5% accuracy requirement added to Section 95191.2(a) for all metering as it strengthens the integrity of the credits generated and the program as a whole. (15d3-011.1)

Agency Response: No changes were made in response to this comment. Staff appreciates the commenter's support for the proposed amendments.

M-2 *Concern About Accuracy Requirements*

Comment: The +/- 5% standard of accuracy specified in § 95491.2 (a) (1) (B) is conceptually clear and generally reasonable; however it may not be sufficient to ensure that published CI scores agree with actual GHG impacts. As long as measurement errors are ≤ 5% and independently distributed around the mean, then the aggregate impact of all errors is likely to be small. It must be clear, however, that errors are independently distributed. Where pathway applicants or certification bodies provide their own calibration procedures for measurement equipment, it is important that any errors be independently distributed around the value being measured. LCFS staff should also be aware that not every instrument can be evaluated in such a way as to yield a single accuracy metric, such as a +/- % score. In those cases, alternative assessments of accuracy may be needed. Additional clarity is also needed around how the +/- 5% accuracy standard referenced in § 95491.2 interacts with the 90th percentile standard provided in the definition of "Conservative." (15d3-081.7)

Agency Response: No changes were made in response to these comments. The five percent standard for meter accuracy is an international accepted standard for reporting greenhouse gasses (GHG), and well as being used in the Mandatory GHG Reporting and Cap-and-Trade regulations administered by CARB. If a manufacturer's recommended method for calibration does not exist, CARB staff will work with stakeholders to develop the best possible method to assure meter accuracy within five percent. Given the numerous different types of meter technologies, meter manufacturers, placement, and utilization of meters it is not possible to come up with meter calibration requirements for every possible permutational a priori. As far as interaction with the definition of conservative, once a meter is shown to be at least five percent accurate, the meter readings will be considered accurate without adjustment, so no further analyses of the metered data is required for the 90 percent confidence interval in Table 13. The metered values as observed are used to calculate the missing data as described in the table.

M-3 *Calibration Requirements for Internal Meters*

Comment: CALIBRATION REQUIREMENTS: SRECTrade finds that the current edits to Section 95191.2(a)(1)(A) do not clarify how 'manufacturer's recommended procedures' for internal meters - which do not have field calibration functionalities - should be treated. Attempting to field calibrate an internal meter that is not designed for post-manufacturing adjustment can result in reduced accuracy, meter damage, voided warranties and compromised data security, which we do not believe is the intent of the regulation.

CARB's previous response to comments referenced that Section 95491.1(c)(1)(G) addresses internal meter accuracy requirements, however SRECTrade does not find Section 95491.1 clear as it relates to the issues above and the most recent revisions to Section 95191.2.

SRECTrade suggests the following options for resolving this issue while proceeding with the adoption of the Amendments:

- CARB could add specific language that clearly indicates that manufacturers specifications certifying internal meters accuracy within 5% are acceptable documentation for verifiers to ensure compliance. Similarly, documentation of an EV charger's certification of compliance with other California EVSE standards (such as the DMS CTEP) should also be considered acceptable evidence of accuracy for verification purposes.
- Alternatively, CARB could remove the most recent edits and leave the language as previously proposed in Section 95191.2 and work with the EV charging industry to develop guidance on metering accuracy verification. This guidance could provide more detail and specific direction than what is currently possible in the regulation. (15d3-011.2)

  Agency Response: No changes were made in response to these comments. The regulation allows that "[i]f manufacturer's recommended procedures do not exist, then a reasonable method must be identified that meets the ±5.00 percent accuracy requirements of this section must be documented in the monitoring plan."

  CARB staff will work with stakeholders to find a method that demonstrates the accuracy of these meters. If the meter is not physically able to be calibrated, it still must periodically demonstrate that it is accurate. If a meter fails an accuracy check, then the meter will need to be serviced or replaced to assure the integrity of the program.

N Fuel Prices

N-1 Multiple Comments: *Proposed Changes Will Increase Gas Prices*

Comment: The LCFS keeps jacking up fuel costs while barely denting carbon emissions, and these amendments make it worse for folks like me. I urge CARB to rethink this. The Section 95482(h) change lets hydrogen with carbon capture dodge the 2035 fossil phaseout and count as 80% renewable by 2030. More hydrogen credits mean higher deficits for gas/diesel when there I already $0.47/gallon extra on gas ($4.80 CA vs. $4.00 U.S., AAA April 2025). Section 95483(c) dumps all base credits to utilities and EV rewards, even motorcycles, cutting gas/diesel relief. Sections 95486.3/95486.4 juice hydrogen station credits—bigger derates, no caps--pushing ZEV buildout while I pay more to fillup. This hits hard for me at roughly $500/year extra for 25k miles, assuming 12 MPG, when 85% of us drive gas/diesel (15M vehicles, DM2024). LCFS costs soared 47% since 2017 (CARB Dashboard), but transportation emissions dropped just 7% (174MMT to 162MMT, CARB2023). That's $17B for peanuts; 37MMT reduced since 2007 (CARB) isn't worth it when credits favor EVs (70%, 2024 data) and leave gas/diesel footing 70% of deficits on 30% of supply. I work out-of-town jobs with high physical risk for my money. Why should I subsidize hydrogen stations or EV rebates when emissions barely budge? These changes deepen the squeeze without proof they work. Pull back--focus credits on gas/diesel relief, not ZEV handouts. Let workers breathe, not just green tech. (15d3-003.1)

Comment: The LCFS keeps driving up fuel prices, and these amendments pile on more pain for students like me, with little proof it's cutting carbon enough to matter. Please reconsider this burden. Section 95482(h) lets hydrogen with carbon capture count as 80%renewable by 2030 and skips the 2035 fossil phaseout. More hydrogen credits mean higher gas prices--already $0.47/gallon extra (CARB2024 Dashboard), pushing California's $4.80/gallon (AAA April 2025)way past the $4.00 U.S. average. Section 95483(c) shifts all base credits to utilities and EV rewards, even motorcycles--nothing for gas users like me. Sections 95486.3 and 95486.4 boost hydrogen station credits with bigger derates and no caps, favoring ZEVs while I pay more to commute to class. Gas is 15% of my $20k/year budget--$300 extra yearly when driving roughly 10k miles a year. Rent's $1,400/month, tuition's $7k (CSU2024)--I'm drowning, and 85% of us drive gas/diesel (15M vehicles, DMV 2024). LCFS costs jumped 47% since 2017 (CARB), but emissions only fell 7% (174MMT to 162MMT, CARB 2023)--$17B for 37MMT since 2007 isn't worth it when EVs hog 70% of credits (2024 data) and gas covers 70% of deficits. I'm studying, working part-time--not slacking. Why should I fund hydrogen or EV rebates when carbon emissions barely budges? These changes squeeze students harder. Shift credits to ease gas costs for those of us who are already doing the most we can. (15d3-004.1)

Comment: These amendments will not increase fuel pump prices. Recent analyses show that retail fossil fuel prices are strongly influenced by many factors (e.g., global events, holiday weekends, seasonal fluctuations, refinery disruptions and decisions about production that affect supply, refinery pricing decisions, seasonal fuel blends, and taxes) and fossil fuel producer pricing strategies are complex, reflecting local and regional market conditions. As CARB has noted: “The reality is that the actual cost pass-through from LCFS to retail gasoline or diesel prices is uncertain, that there is no correlation between historical LCFS credit prices and gasoline prices, and that the LCFS is not a major driver of overall retail fuel prices in California.” This has been demonstrated this year with the increase in fuel pump prices and near an all-time high while LCFS credit prices are near historic lows. (15d3-007.2)

> **Agency Response:** No changes were made in response to these comments, which do not include a specific recommendation for a change to the rulemaking proposal. Please see Agency Response H-1 in the FSOR Appendix A for further information.

O Rulemaking Procedure

O-1 Multiple Comments: *Approve Amended LCFS Program Without Further Delay*

Comment: At this stage, we believe the priority should be the expeditious finalization and implementation of the modified LCFS amendments. As recent softness in credit prices suggests, the market is asking for certainty. Resolving this rulemaking–and making these amendments effective as soon as possible–is paramount for supporting the state’s ambitions to decarbonize the transportation sector. (15d3-006.2)

Comment: Clean Energy continues to support the amendments to the Low Carbon Fuel Standard (LCFS) that were adopted by the California Air Resources Board on November 8, 2024 and supports immediate approval by the Office of Administrative Law (OAL) of the Third 15-day Package, especially before July 1, 2025 so the amendments can be in effect for reporting in the first quarter of 2025.

…

We want to emphasize the need for immediate approval to create investment certainty, which has been placed in jeopardy since the amendments were disallowed by OAL. Credit prices were in the early $70s before the decision and then in the low $50s by early April. Furthermore, the executive order issued by President Trump titled “Protecting American Energy from State Overreach” has concerned the credit market and is another reason for prompt adoption by OAL to stabilize credit prices and provide certainty. (15d3-007.1)

Comment: We support the recent updates to the regulatory text in response to the Office of Administrative Law’s (OAL) disapproval and commend CARB for responding with expediency, clarity, and transparency. We urge the agency to move quickly to finalize the rule with an effective date as of January 1, 2025, as to avoid any further delay and the additional deterioration of the credit market that would be expected to arise as a result of delayed action. Regulatory certainty and prompt implementation are critical to ensuring that project development and capital formation remain robust in support of this program. (15d3-010.1)

Comment: Promus appreciates the pace at which CARB has proposed the LCFS rule revisions to satisfy the California Office of Administrative Law (OAL).

Promus agrees with the changes proposed by CARB and urges a rapid resubmission to OAL to finally implement the new LCFS rules. 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% average CI reduction by 2045. Repeated delays and market uncertainties have undermined financing and development of the lowest carbon fuels. Promus appreciates CARB’s understanding of this and efforts to implement the new regulations as soon as possible. (15d3-012.1)

Comment: The California Utilities appreciate the extensive opportunities for comment throughout the rulemaking process and urge a swift adoption of the regulation. (15d3-020.4)

Comment: Given the LCFS credit surpluses, a significant step down in the Annual Carbon Intensity (CI) Benchmarks cannot be delayed any further. At this stage, the top priority should be the expeditious finalization and 2025 Q1 implementation of the target step down.

All parties received adequate notice throughout this extended rulemaking process and are prepared for implementation of the new rule, effective at the start of the 2025.

Few, if any, parties could have anticipated changes requested by the Office of Administrative Law (OAL). Clean fuel credit generators—such as RNG producers—should not be punished with any further administrative delays to the rule. Obligated parties (deficit generators) are all well informed about the rule changes and further delays are not necessary.

Conclusion

At current LCFS prices—and in the face of the programmatic uncertainty created by more than four years of discussion on this rulemaking—new RNG projects driven by the LCFS will be extremely limited until this rule is finalized.

Finalizing the rule will restore investment certainty, leverage renewable gas production to reduce methane emissions, improve organic waste management, and decarbonize California’s transportation sector. (15d3-024.1)

Comment: The ABC would like to underscore the importance of concluding this rulemaking as soon as possible. Any further delay to the rulemaking diminishes the necessary signal the

market needs to facilitate and encourage the continued investments in clean fuels. Without a strong policy signal, the state risks missing opportunities to further reduce GHG emissions from transportation fuels. Thus, the ABC strongly encourages CARB to swiftly address the concerns laid out in the disapproval, resubmit the package to OAL, and begin implementation of the new amendments promptly. (15d3-025.1)

Comment: At this time, there is only one thing left to do: **We urge CARB to expeditiously adopt the revisions to the LCFS as proposed in its 3rd 15-Day Notice, and to maintain January 1, 2025 as the effective date for the revisions to the program and to require Q1 2025 reporting under the amended targets.** Any further delay with respect to implementing the new provisions that are intended to make the program more effective and durable by ensuring continued investment in low-carbon fuels and fuel technologies would lead to the opposite result. (15d3-026.1)

Comment: CALSTART strongly encourages CARB to expeditiously finalize the rulemaking and initiate implementation of the amendments.

…

Over the course of two years, CARB staff have been working diligently to amend the LCFS and make critical changes that will ensure the program's continued success. CALSTART supports these amendments. While the non-substantive and administrative disapproval of the amendments from the Office of Administrative Law (OAL) has unfortunately delayed the implementation of these much needed amendments, CALSTART would like to urge CARB to swiftly address the concerns presented in OAL's disapproval notice, resubmit the package for approval, and begin implementation of the program asap. Any further delay jeopardizes the state's climate goals and investment in clean fuels including zero-emission technologies. (15d3-030.1)

Comment: Technicality should not delay necessary reductions to the carbon intensity

California cannot afford for technical or clerical errors to keep the state from enacting the carbon intensity revisions by Q1 2025, as these necessary changes are required to provide further stringency to the existing program.

In their disapproval of the regulation, the Office of Administrative Law found no fault with the proposed changes to the carbon intensity. Rather, the OAL found administrative errors in other areas of the text.

These errors should not hold back the regulation from being implemented on time as they would conflict with the agency's stated goal of addressing the surplus bank as soon as possible.

The proposed changes received broad support from a variety of market stakeholders during the regulatory process as numerous entities commented that the state's initial proposal did not adequately address the issue.

In addition, these changes have been known since August, giving entities ample time to prepare for this proposed change. Some of these participants have likely prepared as if this regulation was going to be implemented on April 1.

Delaying this regulation any further would unduly burden those who prepared in good faith for a more stringent program.

Revisions are needed to provide clarity amid federal uncertainty

Low carbon fuel suppliers are currently facing significant uncertainty at the federal level, and California moving ahead with this regulation will provide clarity about future demand of these fuels.

Currently, the federal government has not finalized guidance on the Clean Fuels Production Tax Credit (45Z), while the Environmental Protection Agency (EPA) has not outlined long-term renewable volume obligations.

In addition, the federal government's proposed tariffs, which could affect feed stocks, may place further costs onto these suppliers who may have little clarity about the value of their product.

Coupled with the OAL decision, all of these pending actions are creating significant uncertainty for low-carbon fuel suppliers.

California can provide much needed certainty to this sector, and at the same time, the state can show leadership on climate as it has done so many times before.

Conclusion

After more than four years of discussion about this rule, the ARB should look to implement this regulation as soon as possible to provide certainty to the market and drive more reductions within the transportation sector.

California does not have the luxury of time if intends to achieve its bold climate goals in 2030 and 2045. (15d3-031.1)

Comment: We urge CARB to prioritize the prompt finalization and resubmission of the Modified Text with the earliest possible effective date.

The extended rulemaking process has created uncertainty and deterioration in the credit market. Regulatory stability enhances market efficiency by minimizing price volatility and allowing market participants to allocate resources optimally. A swift resubmission to OAL will signal CARB's commitment to the LCFS program and its goals, which will support more efficient and stable market operation. Additional delay could cause further market disruption and undermine the program's effectiveness by eroding confidence and impeding future market development. (15d3-032.1)

Comment: Gevo Urges CARB to Move Forward in Finalizing the LCFS Revision Package with the Proposed Strengthening of the Compliance Curve, Stepdown, and Automatic Acceleration Mechanism

Gevo urges CARB to move forward to promptly finalize the LCFS revision package. As Gevo has noted in our previous comments, key elements of that package, including the near-term CI stringency increase (i.e., “stepdown”), the strengthening of the overall compliance curve, and the adoption of an Automatic Acceleration Mechanism (“AAM”) are needed to help meet the State’s climate objectives.

Up to now, the LCFS has been a successful program, exceeding its initially projected carbon reductions through what CARB has referred to as “overperformance.” Although the LCFS has supported the production of a greater quantity of low-carbon fuels during a certain timeframe than originally projected, Gevo notes that labelling this phenomenon as “overperformance” is a bit of a misnomer. In actuality, given the State’s aggressive carbon emissions reduction and climate goals, and the challenges associated with meeting them, the situation might better be referred to as underperformance of the CI targets and implementing mechanisms. As CARB

has recognized, because the volume of low-carbon fuel has exceeded projections, the credit prices have been reduced and the credit bank is unduly large, thereby threatening continuing success. Implementing the proposed near-term CI stepdown and AAM alongside the compliance curve/benchmarks revisions is necessary to address this. Accordingly, we urge CARB to move forward in adopting the LCFS revision package including these provisions. (15d3-036.1)

Comment: 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 transportation sector in the state of California. The new proposed targets will ensure that the program continues to attract high levels of investments in renewable energy. We urge the rule's adoption as soon as possible and we support the rule becoming **effective January 1, 2025** to shore up the LCFS credit market and overall investments in renewable energy. Neste also appreciates CARB's efforts to address in a timely manner concerns raised by the California Office of Administrative Law (OAL). (15d3-039.1)

Comment: The OAL's recent administrative disapproval of certain proposed amendments to strengthen the program has unfortunately delayed implementation of critical program amendments. IETA would like to underscore the importance of concluding the LCFS rulemaking as soon as possible. Further delay diminishes the necessary signal the market needs to facilitate and encourage continued investments in clean fuels. IETA strongly encourages CARB to swiftly address the concerns laid out in the disapproval, consider stakeholder feedback, resubmit the package to OAL, and ultimately begin prompt implementation of the new amendments. (15d3-041.1)

Comment: In that vein, we urge CARB to respond continual stakeholder commentary throughout the rulemaking emphasizing the need for regulatory resolution as soon as feasibly possible. For example, the Final Statement of Reasons responds to significant stakeholder support in the efficient resolution of the rulemaking process. CARB should seek to implement the LCFS amendments effective January 1, 2025. This is necessary to respond to LCFS credit market instability due to the

"record amount of renewable energy generating significantly more credits than are required to offset deficits created by the currently outdated CI targets," and the need to "send clear and stable market signals," to name a few.

OAL's comments on the rulemaking package, and CARB's 15-day changes, are relatively narrow in scope and mostly non-substantive. We encourage CARB to efficiently review public comments and promptly submit its revised rulemaking package to OAL as soon as possible. CARB should encourage OAL to complete its review and file the regulations with the Secretary of State to ensure an effective date before the end of the reporting period for the first quarter of 2025. (15d3-043.2)

Comment: We strongly support CARB and the Office of Administrative Law ("OAL") finalizing this package as soon as possible to provide clarity to the market and clean fuels investors. Provided that CARB and OAL finalize the rule before Q1 reporting is due, we anticipate the step down in 2025 stringency and new benchmarks would apply to Q1 reporting. We strongly support the rapid finalization of this rulemaking process to enable this outcome and bolster the market for clean fuels. (15d3-044.1)

Comment: At this point, the most important thing to support California's clean fuels market is to rapidly finalize and implement the proposed amendments, in order to provide certainty to the

market and allow ongoing investment to support California's clean transportation objectives. (15d3-044.4)

Comment: We would like to thank CARB staff for their ongoing work throughout the rulemaking process, and the swift turnaround to address the Office of Administrative Law's concerns regarding the rulemaking package submitted in January 2025. World Energy is supportive of CARB's forward progress in finalizing the LCFS rulemaking. An expeditious resubmission to OAL is crucial to grant long-awaited market clarity to LCFS participants. (15d3-045.1)

Comment: We appreciate how quickly CARB staff has responded to the Office of Administrative Law (OAL) disapproval feedback and urge CARB to prepare the final package to return to OAL as expeditiously as possible following this 15-day public comment period. It is paramount that this LCFS amendment package be approved and made effective as soon as possible in 2025 with respect to the carbon intensity (CI) targets and the market signal they provide. (15d3-048.1)

Comment: The Transport Project thanks CARB for its work and requests expedient approval of the Third 15-day Package before July 1, 2025, to allow the amendments to be in effect for the first quarter of 2025. (15d3-054.2)

Comment: Timely implementation of these amendments is critical to ensure market confidence and certainty. We are concerned that continued delays in finalizing the regulation could prevent the step-down from applying in Q1 2025, limiting meaningful structural corrections to support credit market stability before the AAM can first take effect in 2028. The step-down is essential to providing interim market direction and ensuring the LCFS continues to drive clean transportation investment. We encourage CARB to finalize these regulations and to work closely with the Office of Administrative Law to ensure the package is finalized as quickly as possible. (15d3-056.2)

Comment: We appreciate the Board's continued work to refine the rule and ensure its clarity and consistency with the Administrative Procedure Act. We urge CARB to swiftly finalize and implement the rule without further delay.

…

The current rulemaking has now spanned nearly three years and multiple iterations. While the process has benefited from significant public input and revision, prolonged uncertainty creates real consequences for companies like ours that deliver RNG to California. Continued delays in rule finalization impact both current projects and future development, particularly as LCFS credit markets remain sensitive to regulatory signals. Timely approval of the final amendments will provide developers with the regulatory certainty needed to proceed with confidence.

Therefore, we urge CARB to adopt the proposed final amendments and resubmit the package to the Office of Administrative Law within the statutory deadline. (15d3-058.1)

Comment: We respectfully urge the Board to approve the amendments and resubmit the package to the Office of Administrative Law within the 120-day window. (15d3-059.1)

Comment: We support the proposed Third 15-Day Amendments and urge CARB and the Office of Administrative Law (OAL) to finalize and implement the rule without further delay. After several years of regulatory uncertainty and declining credit values, the LCFS market needs stability. Finalizing this rule will restore market confidence and ensure that project developers can continue investing in clean fuel infrastructure.

The new rules are not necessarily favorable to dairy biogas, as they include a reduction in the number of years that dairy biogas projects can remain eligible to claim avoided methane benefits, among other policies that we hope may be later changed. However, the overall state of the LCFS market requires clarity and stability, and so we urge rapid adoption of the new rules. (15d3-062.1)

Comment: We believe CARB's top priority should be immediate finalization and a January 1, 2025, effective date for the lower 2025 carbon intensity Benchmark requirements in Section 95484 of the new rule.

All parties received adequate notice throughout this extended rulemaking process and are prepared for implementation the new Benchmark effective at the start of the 2025. Clean fuel credit generators—such as RNG producers—should not be punished with any further administrative delays to the rule, either from CARB or OAL. Obligated parties (deficit generators) are all well informed about the rule changes and further delays are not necessary. This has been a highly transparent multi-year process with ample public hearings and opportunities for all concerned parties to participate and comment. It is time to move forward with implementation.

Conclusion

At current LCFS prices, and in the face of the programmatic uncertainty created by years of discussion on this rulemaking, new RNG projects driven by the LCFS will be extremely limited until this rule is finalized. Additionally, existing funding covenants and future investments are at serious risk due to delays in implementation.

Finalizing and implementing the rule will restore investment certainty, leverage renewable gas production to increase methane destruction, add additional jobs in economically disadvantaged communities, and further decarbonize California's transportation sector. (15d3-063.1)

Comment: We appreciate the opportunity to provide comments on this vitally important program. We are at a pivotal moment for a variety of climate and clean air goals that depend in part on a strong and well-designed LCFS program. Timely adoption and implementation are needed to provide clear market signals for the nascent fleet electrification industry. (15d3-070.4)

Comment: We support the proposed Third 15-Day Changes and clarifications, including those around hydrogen refueling infrastructure (HRI) crediting, and we urge CARB to quickly finalize this regulatory package, and the Office of Administrative Law to approve it, so that the amendments can take effect as soon as possible and investments can follow to support California's clean transportation goals. (15d3-071.1)

Comment: We request that the amendment become effective on the date specified according to the general rule on the OAL website, i.e., July 1, 2025. Doing so will eliminate confusion among stakeholders. (15d3-073.1)

Comment: CalBio urges CARB and OAL to adopt the latest 15-Day Rulemaking Package as amended

We write these comments to commend CARB's continued leadership in advancing policies that address climate change, promote public health, and stimulate economic growth. The LCFS has been instrumental in facilitating the development of dairy digesters. According to data from the California Department of Food and Agriculture (CDFA), dairy digesters in California are on track to collectively reduce approximately 2.4 million metric tons of CO_2-equivalent ($MTCO_2e$)

emissions annually—marking significant progress toward achieving the 40% methane reduction target set by SB 1383.

Also important to consider are the environmental, health, and economic benefits of the LCFS program. Since its inception, the program has achieved a reduction of approximately 13% in the carbon intensity of transportation fuels, displacing over 30 billion gallons of petroleum fuel and reducing emissions equivalent to removing 6.4 million cars from the road. This reduction in fossil fuels translates directly into public health benefits. CARB estimates that from 2024 to 2046, the LCFS will result in $5 billion in savings from avoided health outcomes, primarily through enhanced air quality.

While we believe there are aspects of the regulation which could be improved – namely the concerns we had raised in previous around data substitution methodologies in Section 95491.234, we believe CARB and the Office of Administrative Law (OAL) should adopt the final draft regulation of the LCFS Program as written. Given the growing LCFS credit bank, **it is imperative that the effective date of the regulation be applicable to Q1 2025 dispensing fuel reporting activities such that the LCFS Carbon Intensity Benchmarks stated in Table 2 and Table 3 of the Proposed Regulation remain in full effect**. (15d3-080.1)

> **Agency Response:** No changes were made in response to these comments. Staff appreciates commenters' support for the proposed amendments and acknowledges concerns about regulatory uncertainty. CARB is moving expeditiously to complete the rulemaking update process and remain committed to providing transparency on the program's outcomes pursuant to Board Resolution 24-14 and conducting stakeholder engagement to improve the program. For additional information on the public process undertaken by CARB during this rulemaking, please see response S-1 in Appendix A of the FSOR released on January 3, 2025, or visit the LCFS Rulemaking webpage.

O-2 Multiple Comments: *Public Process and Transparency*

Comment: I respectfully ask that CARB make all regulatory documents and amendments accessible in plain language to support public understanding and meaningful participation. The complexity of the tracked changes and APA formatting poses a barrier for students, working people, and non-technical community members trying to stay informed and advocate for equitable policy. (15d3-009.2)

Comment: In light of the Office of Administrative Law's (OAL) disapproval of the previous rulemaking package,[1] WSPA urges CARB to issue implementation guidance – including a workshop or webinar – to address potential delays in implementation of the revised program requirements and to solicit additional stakeholder feedback on changes made to address this disapproval decision. (15d3-038.1)

> **Agency Response:** In response to the comment asking CARB to make all regulatory documents and amendments accessible in plain language, CARB prepares an Initial Statement of Reasons (ISOR) as required for any rulemaking to provide the public an overview of a proposed regulation or amendments to a regulation. In the ISOR, CARB is required to describe the specific purpose for each adoption, amendments, or repeal, as well as a description of their respective rationale. For all modifications to the proposed regulation or amendments introduced in the ISOR (i.e., modifications introduced in this Third 15-day package), CARB prepares a Notice of Public Availability of Modified Text and Availability of Additional Documents and/or Information, where CARB describes each of the modifications in plain language. In addition to these documents, CARB

provides alternative formats to the proposed regulatory text, so stakeholders can toggle between a tracked change version and clean version.

In response to the comment urging CARB to issue implementation guidance, following OAL review, if the proposed amendments will come into effect, staff will update all LCFS implementation support documents to reflect the amended LCFS regulations. As always staff will be available to answer any implementation questions from stakeholders.

O-3 *Need for Additional Rulemaking in the Near Future*

Comment: 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 or prevent future destabilizations of the LCFS credit market. As California has progressed through the early phases of its transition toward net-zero emissions, a number of parameters, protocols, or structural assumptions in the LCFS may no longer appropriately reflect current conditions. These include, but are not limited to EERs, ILUC adjustment values, the method by which fossil fuel displacement is credited, 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, and differentiation between so-called "bridge" fuels and those with the capacity to achieve carbon neutrality. As discussed in our many comments throughout this rulemaking process, these issues have demonstrated actual or potential capacity to negatively affect the LCFS and/or continued 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 challenges in 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. (15d3-081.9)

Agency Response: No changes were made in response to this comment, which does not include a specific recommendation for a change to the rulemaking proposal. CARB is committed to initiate future rulemakings as may be appropriate to improve and

enhance the LCFS to support California's climate goals. Board direction from Resolution 24-14 identified many specific aspects of the program that staff will work to transparently monitor and adjust as needed.

O-4 Multiple Comments: *Do Not Approve Amended LCFS Program or Delay Implementation*

Comment: It is my belief that the changes made in the "Third Notice of Public Availability of Modified Text and Availability of Additional Documents and Information" are not sufficient to implement the "Proposed Low Carbon Fuel Standard Amendments." Changes made in the "Third Notice..." do not sufficiently respond to the concerns of the nonprofit groups, Food and Water Watch, Communities for a Better Environment, and Growth Energy regarding carbon credit given for the production of renewable hydrogen from the burning of biomethane.

Renewable hydrocarbons are a necessary clean energy source for long term energy storage as we shift away from burning fossil fuels. However, the Board does not account for the implication crediting renewable hydrogen production will have on large agricultural animal feeding operations. Though I acknowledge the positive incentive this amendment has to move away from fossil fuel reliance, incentivizing fuel production in animal agricultural operations will only increase the size of these GHG hotspots. In 2022, the agricultural sector accounted for 8% of state GHG emissions with 70% of these GHG emissions deriving from livestock, primarily dairy farms (California Air Resources Board, 2024). It is my fear that encouraging biomethane production will increase agricultural GHG emissions as agriculture operations see incentive in expanding their operations. Methane digesters are now common among large dairy farms as it is only large livestock feeding operations that can produce a sufficient amount of manure to benefit off renewable hydrogen production. Herd sizes of dairy facilities grew roughly 3.7% in a year, moving against Biden's Global Methane Pledge committing to a 20% reduction in herd sizes (Skiff, 2024). While the nation should be transitioning away from its dependence on livestock feeding operations, California is moving backwards.

"The Proposed Low Carbon Fuel Standard Amendments" if adopted, will result in a nonuniform transition to better air quality. I urge the California Air Resources Board to vote against the "Proposed Low Carbon Fuel Standard Amendments." The state of California should not jeopardize the air quality of our future for a fleeting economic benefit to the livestock industry. (15d3-005.1)

Comment: CARB should extend compliance and reporting deadlines to account for delays associated with OAL's disapproval; (15d3-038.2)

Comment: OAL issued a disapproval of CARB's LCFS Program Amendments on February 25, 2025, which has delayed the effective date of these amendments by nearly six months. This unexpected – and significant – delay requires corresponding extensions of forthcoming compliance deadlines in order to allow regulated entities sufficient time to meet new program requirements. WSPA urges CARB to adjust any future reporting provisions in accordance with the forthcoming effective date of the revised regulation. In particular, WSPA recommends the following updates:

- ***CI Benchmarks***: WSPA reminds CARB that they should not move the new 2025 Carbon Intensity (CI) target back to the start of this year. Indeed, in CARB's Notice of Public Availability for the first set of 15-day changes,13 CARB explicitly stated that "[t]he proposed compliance target for 2025 will take effect for Quarter 1, 2025 reporting ***if*** the Proposed Amendments ***become effective prior to April 1, 2025***, which marks the

beginning of the Quarter 1 2025 reporting period." WSPA recommends that the new benchmarks take effect only after the effective date of the rule, i.e. July 1, 2025. In accordance with the Market Notice posted by CARB after OAL's disapproval,[14] regulated entities have relied on the currently effective LCFS regulation for activities occurring in Q1 and Q2 of 2025. In addition to being a potential violation of due process principles under the U.S. and California Constitutions, retroactive CI targets would likely result in retroactive impacts to fuel transactions which have already occurred, substantial administrative burden, and quarterly reporting challenges. (15d3-038.9)

Comment: However, we note that with a market-wide policy like the LCFS, where innovation is taking place all the time and new and unforeseen variables arising, it is critical that CARB maintain discretion in implementing the program moving forward. While some of the clarifying changes limit some implementation flexibility, we urge CARB to continue proactive stakeholder outreach throughout the implementation process, providing ongoing market guidance as appropriate, and exercising discretion in implementation and enforcement of the rule to ensure that the rules remain clear and to avoid unintended or unnecessary burdens on project developers that do not advance the program's objectives. Ongoing stakeholder engagement and timely guidance on implementation issues remains essential to ensuring proper compliance planning, accurate credit generation, and maintain market certainty for regulated parties. (15d3-044.9)

Comment: Unfortunately, the mere cosmetic changes CARB has proposed in this Third 15-Day Changes fall far short of addressing the pervasive lack of clarity throughout this section of the Amendments. As such, we encourage CARB to meaningfully address the Crop Requirements' problematic scope and clarity. Absent much needed reconsideration and clarification, we urge OAL to again disapprove of the Amendments, including because CARB has not adequately evaluated and disclosed the sweeping changes to agricultural production and substantial costs the Amendments engender. (15d3-069.1)

Comment: Moreover, OAL's initial disapproval has already delayed the regulatory process by months. We urge CARB to account for this unexpected delay and adjust the compliance deadlines to provide regulated parties adequate time to respond to the costs and complexities of the new rules and their impacts on agricultural markets and biofuels production. Relatedly, CARB's assessment of compliance costs released to the public for the first time after the Board voted to approve the Amendments lacks foundation and misstates by orders of magnitude potential compliance costs. A more realistic assessment, which should have been disclosed to the public and offered for comment, would highlight the substantial challenges for regulated parties and their supply chains in complying with the Crop Requirements, particularly on the expedited timeframe provided in the Amendments. As such, we urge CARB to thoroughly consider the economic consequences of the Amendments on both regulated parties and California consumers, along with the impacts of this regulatory delay, as it would be arbitrary and capricious for the agency to maintain its initial timeline in these circumstances. (15d3-069.2)

Agency Response: No changes were made in response to these comments. Staff acknowledges concerns about the proposed amendments. The primary objective of the Third 15-Day changes is to address the issues identified in OAL's Decision of Disapproval.

In response to comments regarding delaying the implementation of the proposed amendments and engaging with stakeholders on implementation, staff will announce an effective date for the amendments when known, and will continue to engage with

stakeholders on implementation following OAL's review of and determination on CARB's resubmission of the rulemaking. For more details on OAL's process and timeline, please see the Agency Response to Section O-1 above.

P Miscellaneous

P-1 Multiple Comments: *Support for Other Stakeholders' Comments*

Comment: Neste also supports the comments from the Low Carbon Fuels Coalition (LCFC) and ICF on this rulemaking. (15d3-039.3)

Comment: We support comments from the RNG Coalition and agree that all stakeholders have received adequate notice and are prepared to implement the amendments as soon as they are finalized through OAL. (15d3-044.2)

Agency Response: No changes were made in response to these comments. Staff acknowledges these stakeholder comments in support of comments provided by other organizations. All comments submitted by the referenced organizations have been responded to elsewhere in the FSOR and/or the FSOR Addendum.

P-2 Multiple Comments: *General Concerns*

Comment: Please ensure this amendment process upholds climate justice, centers public health, and avoids greenwashing technologies that benefit fossil fuel companies more than frontline Californians. (15d3-009.3)

Comment Summary: CARB's Third 15-Day Changes did not address any of the fundamental issues raised by the Soybean Associations in the First and Second 15-Day Changes and fails to acknowledge the potential unintentional consequences of a feedstock outlined by its own employees in previous discussions. CARB is required under the law to achieve the maximum technically feasible and cost-effective reductions in greenhouse gas emissions. The most recent 15-Day Changes show a lack of willingness to achieve the statutory obligations set forth in AB-32 and neglect modernized, climate smart, science-based solutions, ultimately disregarding the protection of U.S. based feedstocks, the people, and the planet. (15d3-014.2, 15d3-23.2, 15d3-33.2, 15d3-046.1, 15d3-055.2, 15d3-061.2, 15d3-066.2, 15d3-072.2, 15d3-077.2)

Agency Response: No changes were made in response to these comments. Staff acknowledges the commenters' concerns and responded to any and all specific recommendations in response to the Third 15-Day package elsewhere in this Addendum. The Third 15-Day changes are responsive to OAL's Decision of Disapproval.