Notice of Public Availability of Modified Text and Availability of Additional Documents and/or Information

Proposed Low Carbon Fuel Standard Amendments

Public Hearing Date: November 8, 2024 Public Availability Date: August 12, 2024 Deadline for Public Comment: August 27, 2024

CARB has determined that additional modifications are appropriate for the proposed amendments and has developed the proposed modifications (15-Day Changes) as stated below in the "Summary of Proposed Modifications" section of this notice. The Attachments showing the specific proposed modifications to the text of the proposed regulation being made with these 15-Day Changes are shown in multiple ways in order to meet the requirements of the Administrative Procedure Act (APA) while also posting alternate/complementary versions that provide increased accessibility to view the modifications in multiple ways.

The Attachments are as follows:

Attachment A - Amendments to Sections 95481, 95482, 95483, 95483.2, 95484, 95485, 95486, 95486.1, 95486.2, 95486.3, 95486.4, 95487, 95488, 95488.1, 95488.3, 95488.5, 95488.6, 95488.7, 95488.8, 95488.9, 95488.10, 95489, 95490, 95491, 95491.1, 95491.2, 95495, 95500, 95501, and 95503, Title 17, California Code of Regulations

- Attachment A-1: Proposed 15-Day Modifications to Proposed Regulation Order (Proposed Sections for Amendments) (compared to version released for 45-day comments)
- Attachment A-1.1: ~Alternative format to Attachment A-1 (Proposed Sections for Amendments)~
- Attachment A-1.2: Proposed 15-Day Modifications to Proposed Regulation Order (15-Day Modifications and 45-Day Modifications combined and compared to existing regulatory text) in Alternative format
- Attachment A-2: Proposed 15-Day Modifications to Proposed Regulation Order (Proposed Sections for Adoption) (compared to version released for 45-day comments)
- Attachment A-2.1: ~Alternative format to Attachment A-2 (Proposed Sections for Adoption)~

The Attachments showing the specific proposed modifications to the text of the proposed regulation orders available for comment with this Notice are provided in the two formats denoted with the suffixes "-1," "-1.1," "-2," and "-2.1."

In the version denoted Attachments A-1 and A-2, the 45-Day Changes (proposed regulatory language as posted on December 19, 2023, are shown in "normal type." The deletions and additions to the 45-Day Changes that comprise the 15-day Changes that are being made public and available for comment with this Notice are shown in strikeout to indicate deletions and <u>underline</u> to indication additions.

In the version denoted Attachments A-1.1 and A-2.1, the 15-Day Changes are provided in a tracked-changes format to meet the requirement for accessible electronic documents. The 45-Day Changes are incorporated into this version as plain, clean text because they are not being made available for public comment by this Notice. The Proposed 15-day Changes are shown in tracked changes and are made public with this Notice and available for comment. To review this document in a clean format, without underline or strikeout to show changes, that shows all the proposed regulations being considered for adoption, please select "Simple Markup" or "No Markup," or accept all changes in Microsoft Word's Review menu. You can also change the view to the initially proposed 45-Day Changes (originally proposed regulatory text prior to these proposed modifications) by selecting "Original" or rejecting all tracked changes. Additionally, "Advanced Track Changes Options" will allow for further options regarding color and other markings.

In the version denoted Attachment A-1.2, the existing, original regulatory language currently adopted into the California Code of Regulations (pre-45-Day Changes) is shown as plain, clean text, while the 45-Day Changes <u>and</u> the proposed 15-Day Changes are combined and shown in tracked changes. To review the net proposal in this document in a clean format (no underline or strikeout to show changes), please select "Simple Markup" or "No Markup" in Microsoft Word's Review menu or accept all changes. You can also change the view to the original (originally proposed regulatory text <u>prior</u> to any proposed modifications, or 45-Day Changes) by selecting "Original" or rejecting all tracked changes. By progressing through the changes and comparing them with the 15-Day Changes, the public can see the net and stepwise changes being proposed in relation to existing law. Please refer to the versions denoted A-1 and A-2 to review the 15-Day Changes available for comment and its companion/alternate version A-1.1 and A-2.1 to view an accessible version showing the 15-Day Changes.

In the Final Statement of Reasons, staff will respond to all comments received on the record during the comment periods. The APA requires that staff respond to comments received regarding all noticed changes. Therefore, staff will only address comments received during this 15-day comment period that are responsive to this notice, documents added to the record, or the changes detailed in Attachments A-1.1 and A-2.1.

Summary of Proposed Modifications

Clarifications and error corrections were made to the Tier 1 calculators and Instruction Manuals in response to public comments.

The following summary does not include all modifications to correct typographical or grammatical errors, changes in numbering or formatting, nor does it include all of the non-substantive revisions made to improve clarity.

Modifications to Section 95481. Definitions and Acronyms.

 In section 95481(a), staff proposes to add, delete, or modify a number of definitions, including but not limited to: "Alternative Jet Fuel," "Feedstock First Collection Point," "Feedstock First Gathering Point," "Food Scraps," "LCFS Data Management System," "Organic Waste," "Private LMD-FCI Charging Site," "Private HD-FCI Charging Site," "Private LMD-HRI Station," "Private HD-HRI Station," Public LMD-FCI Charging Site," "Public LMD-HRI Station," "Recovered Organics," "Renewable Diesel," "Renewable Gasoline," "Rural Area," "Shared HD-FCI Charging Site," "Shared HD-HRI Station," and "Fossil Jet Fuel used for Intrastate Flight."

Modifications to Section 95482. Fuels Subject to Regulation.

- 1. In section 95482(a), staff proposes to remove "Fossil Jet Fuel" from the list of transportation fuels that the LCFS applies to. Staff initially proposed to eliminate the LCFS exemption for fossil jet fuel as to intrastate fossil jet fuel. Staff estimated that the proposal would result in the generation of deficits for around 10% of fossil jet being used in California. Public commenters noted that the original proposal did not guarantee that airlines would procure and use alternative jet fuel as a compliance response to the deficits generated from fossil jet fuel. Aviation fuel suppliers who would generate deficits under the initial proposal could simply acquire credits to meet that compliance obligation. Staff remains committed to finding effective ways to reduce emissions from the aviation sector through the production and use of cleaner aviation fuels and other low-carbon alternatives to fossil jet fuel. CARB also recently released a *fact sheet* on partnering with federal and local agencies to address harmful air pollution at airports.
- 2. In section 95482(c), staff proposes to restore the existing exemption for all fossil jet fuel. This proposed modification is necessary to maintain consistency with the modification to subsection 95482(a) discussed above.
- 3. With the proposed addition of subsection 95482(h), staff proposes to remove LCFS credit generation eligibility for hydrogen produced using fossil gas as a feedstock, effective January 1, 2031. The 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan Update)¹ 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. Instead, it identified as low carbon and renewable hydrogen produced through steam methane reformation of biomethane,

¹ California Air Resources Board. 2022 Scoping Plan for Achieving Carbon Neutrality. November 16, 2022. https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp_1.pdf

electrolysis, and biomass gasification. Staff is proposing to remove LCFS crediting eligibility for hydrogen produced from fossil fuels at the end of 2030 to align with the current operational timeline for projects funded under the hydrogen hubs grants, which will expand the supply of renewable hydrogen in California.²

4. With the proposed addition of subsection 95482(i), staff is proposing to provide credits for biomass-based diesel produced from virgin soybean oil and canola oil for up to 20 percent of annual biomass-based diesel reported on a company-wide basis. Biomassbased diesel from virgin soybean and canola oil in excess of 20 percent will be assessed the carbon intensity of the applicable diesel pool benchmark for that year, or the certified carbon intensity of the applicable fuel pathway; whichever is higher. California currently leads the nation in ZEV sales and stocks. As auto manufacturers comply with increasing ZEV sales requirements and as California prioritizes waste feedstocks and advanced decarbonization technologies, the State must ensure that other regions are able to also access increasing volumes of low-carbon alternative fuels. California expects that overall diesel demand will decline in the State over the coming decades due to the State's portfolio of ZEV and clean fuel polices. This proposed addition allows for California to displace up to 100% of the State's current fossil diesel demand with cleaner alternative diesel. The proposed addition also avoids sending a long-term signal for virgin soy or canola oil to serve California demand. For companies that already have a certified fuel pathway prior to the effective date of the amendments and for which the percentage of biomass-based diesel produced from virgin soybean oil or canola oil was greater than 20 percent of combined reported biodiesel and renewable diesel quantities for that company's 2023 LCFS reporting, this provision would take effect starting January 1, 2028, to provide time to adjust feedstock supply contracts as needed. All other companies would be subject to this requirement upon the effective date of the amended regulation.

Modifications to Section 95483. Fuels Reporting Entities.

- 1. In section 95483(a), staff proposes to remove fossil jet fuel from the list of liquid fuels. This proposed modification is necessary for consistency with the proposed modifications to subsections 95482(a) and 95482(c) discussed above.
- 2. In subsection 95483(a)(1)(C), staff proposes to remove the initially proposed narrower exemption for fossil jet fuel to be consistent with the proposal to restore the broader exemption in subsection 95482(c) discussed above.
- 3. In subsection 95483(c)(1), staff proposes modifications to allow the Executive Officer to assign a portion of base credits to Original Equipment Manufacturers (OEM) of electric vehicles, if model year 2024 ZEV sales for vehicle classifications subject to the Advanced Clean Cars regulation are less than 30 percent of new vehicle sales. Continued consumer facing support for the light duty vehicle sector is important to help achieve the state's air quality and climate goals as soon as possible. In subsection (c)(1)(B), staff proposes that the Executive Officer may direct up to 45 percent of base credits to OEMs. OEMs must spend base credit proceeds to support transportation electrification, including a number of eligible project types, such as rebates and incentives for individuals purchasing or leasing new or previously-owned EVs, installing

² ARCHES H2. *California's renewable hydrogen hub officially launches.* July 17, 2024. *https://archesh2.org/arches-officially-launches/*

EV infrastructure, marketing and outreach programs in California, or other projects approved based on specified regulatory criteria. Similar to the holdback equity requirements, OEMs may not spend more than 7% of total base credit funding on administrative costs. If the OEMs receive base credits, utilities will no longer be required to contribute to a Clean Fuel Reward program, and credits available for holdback equity projects are unaffected.

- 4. In subsection 95483(c)(1)(A)5., staff proposes to remove as unnecessary the specified date of January 1, 2025, for implementation of amendments to the holdback equity program requirements. Any proposed amendments to holdback equity program requirements adopted by CARB and approved by the Office of Administrative Law will be effective starting on the applicable effective date.
- 5. In subsection 95483(c)(1)(A)5.c., staff proposes to increase the percentage of administrative cost of holdback credit equity projects from 5% to 7%. This increase is necessary in order to ensure utilities have the sufficient staffing to expeditiously use holdback funds for equity purposes.
- 6. In subsection 95483(c)(1)(C)1.b., staff proposes to remove the demonstration requirement for generating incremental credits for smart charging. The required enrollment in an available Time of Use rate plan with the LSE serving the residence was designed to ensure fidelity for reporting purposes. But telemetries and other data collection methods that are now universally available for reporting to the smart charging pathway make the current requirement unnecessary.

Modifications to Section 95483.2. LCFS Data Management System.

 In subsection 95483.2(b)(8)(B)6., staff proposes to correct the term "FSE" to "equipment" with regard to the registration requirements for electric forklifts, electric cargo handling equipment, electricity provided to ocean-going vessels at berth, and electric transport refrigeration units.

Modifications to Section 95484. Annual Carbon Intensity Benchmarks.

- In section 95484(b)(2)(A), staff proposes to add the word "annual" as clarification that the deficit quantity relied upon as part of the auto adjustment mechanism trigger is a full year's worth of deficits.
- 2. In sections 95484(d) through (f), staff proposes to modify the average carbon intensity benchmarks for gasoline and fuels used as a substitute for gasoline, diesel fuel and fuels used as a substitute for diesel fuel, and fuels used as a substitute for fossil jet fuel in Tables 1, 2, and 3, respectively, for various years. Specifically, staff is proposing to modify the near-term increase in stringency to a 9% CI reduction in 2025 from the 5% year-to-year increase included in the initial amendments proposal. Staff is proposing this increase in near-term ambition in light of the continued growth in low-carbon fuels and in response to stakeholder feedback requesting an increase in stringency to bring deficits and credits into balance. The compliance targets between 2025 and 2030 are adjusted in the 15-day modifications package to smooth the curve between the more ambitious 2025 compliance target and the originally-proposed 30% reduction in 2030, which staff are proposing to maintain. The 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. See

Attachment C to this notice for more discussion regarding the proposed compliance targets.

Modifications to Section 95486.1. Generating and Calculating Credits and Deficits Using Fuel Pathways.

- In subsection 95486.1(a)(1), staff proposes to remove fossil jet fuel from the equation to calculate credits and deficits using fuel pathways. This proposed modification is necessary to maintain consistency with the modifications to subsections 95482(a) and (c) discussed above restoring the broader fossil jet fuel exemption.
- In section 95486.1(a)(4), staff proposes to remove the pre-2011/post-2010 delineation for Fixed Guideway System crediting. This adjustment provides equal treatment to all fixed guideway systems for the purposes of LCFS crediting and improves LCFS support for transit services in California.
- 3. In section 95486.1(a), Table 5, staff proposes to update the EER values for electricity forklifts with lift capacity less than 12,000 pounds and hydrogen fuel cell forklifts with lift capacity less than 12,000 pounds. In 2010, the baseline year for the LCFS regulation, the population of forklifts with lift capacity less than 12,000 pounds was already one-half electrified. The proposed updated EER value for electricity forklifts with lift capacity less than 12,000 pounds takes into account both the electrified and non-electrified portions of that baseline forklift population. The revised EER takes the average of 1 (when comparing to electric forklifts) and the original EER of 3.8 (when comparing to combustion engine forklifts), and the analogous approach is applied to fuel cell forklifts.

Modifications to Section 95486.2. Generating and Calculating Credits for ZEV Fueling Infrastructure Pathways.

- In subsection 95486.2(a)(1), staff proposes to sunset the application eligibility for HRI pathways. Applications for the HRI pathway will not be accepted once applications for the LMD-HRI and HD-HRI pathways are being accepted, starting with the effective date of the 2024 amendments.
- 2. In subsection 95486.2(a)(3)(A), staff proposes to modify the equation used to calculate whether HRI applications will continue to be approved, using data from the most recent quarter data are available, rather than the prior quarter. As credit generation occurs in the first quarter, is reported in the second quarter, and is issued in the third quarter, decisions in the third quarter are often made using first quarter data, not second quarter data.
- 3. In subsection 95486.2(a)(4)(E), staff proposes to clarify that an FSE must dispense hydrogen in a given quarter to generate HRI credits, consistent with the intent stated in the 2018 LCFS Final Statement of Reasons.
- 4. In subsection 95486.2(a)(6)(C), staff proposes to modify the reporting and recordkeeping requirements for HRI applications. Cost and Revenue data will be reported yearly, rather than quarterly, to reduce the reporting burden on HRI applicants without any loss of data.
- 5. In subsection 95486.2(a)(7), staff proposes to remove the section of the regulation describing the transition to light-duty hydrogen refueling infrastructure pathways. The proposed creation of section 95486.3 replaces this transition of the original HRI pathway

into light-duty HRI pathway. The original HRI pathway and proposed light- and medium-duty pathways will exist concurrently under the same 2.5 percent of deficits cap, as described in section 95486.3(a)(2).

- In subsection 95486.2(b)(1)(B), staff proposes to sunset the application eligibility for FCI pathways. Applications for the FCI pathway will not be accepted once applications for the LMD-FCI and HD-FCI pathways are being accepted, starting the effective date of the 2024 amendments.
- 7. In subsection 95486.2(b)(1)(D), staff proposes to reduce the FSE minimum nameplate power rating to 50 kW. 50 kW chargers can more easily provide fast charging services in remote areas and other areas where the distribution system may currently bottleneck total available power for charging.
- 8. In subsection 95486.2(b)(3)(A), staff proposes to modify the condition for which FCI credits could generate credits. Limiting a single applicant to 20% of available credits ensures significant participation in the program by many applicants, allowing multiple technologies and business methods to benefit from the incentive.
- 9. In subsections 95486.2(b)(3)(B) and (C), staff proposes to modify the equation used to calculate whether FCI applications will continue to be approved, using data from the most recent quarter data are available, rather than the prior quarter. As credit generation occurs in the first quarter, is reported in the second quarter, and is issued in the third quarter, decisions in the third quarter are often made using first quarter data, not second quarter data.
- 10. In subsection 95486.2(b)(4)(F), staff proposes to clarify that an FSE must dispense electricity in a given quarter to generate FCI credits, consistent with the intent stated in the 2018 LCFS Final Statement of Reasons.
- 11. In subsection 95486.2(b)(6)(B), staff proposes to modify the reporting and recordkeeping requirements. Cost and Revenue data will be reported yearly, rather than quarterly, to reduce the reporting burden on FCI applicants without any loss of data.
- 12. In subsection 95486.2(b)(7), staff proposes to remove the section of the regulation describing the transition to light-duty fast charging infrastructure pathways. The proposed creation of section 95486.3 replaces this transition of the original FCI pathway into light-duty FCI pathway. The original FCI pathway and proposed light- and medium-duty pathways will exist concurrently under the same 2.5 percent of deficits cap, as described in section 95486.3(b)(2).

Modifications to Section 95486.3. Generating and Calculating Credits for ZEV Fueling Infrastructure Pathways for Light- and Medium-Duty Vehicles.

 In section 95486.3(a), staff proposes to add a new section for HRI pathways for light- and medium-duty (LMD) hydrogen refueling stations. This section replaces previously proposed subsection 95486.2(a)(7) and includes the medium-duty portion of the previously proposed section "Medium- and Heavy-Duty Hydrogen Refueling Infrastructure (MHD-HRI) Pathways". Combining the light- and medium-duty vehicles into a single HRI program simplifies credit calculation for the pathway and provides additional credit space for the heavy-duty vehicles in the HD-HRI program. The maximum HRI capacity of LMD-HRI stations is proposed to be increased to 2,000 kg/day in recognition of additional demand from medium-duty vehicles. LMD-HRI stations are proposed to be categorized into public and private stations: public stations continue to be credited at one-half their HRI capacity, while private stations will be credited at one-quarter their HRI capacity. This provision allows private stations to participate in the program, while providing greater incentive to public stations, which likely face larger economic barriers to install and operate given that the refueling demand varies from day to day. Terminology is also updated throughout section 95486.3 to reflect the grouping of MD vehicles with the LD provision.

2. In section 95486.3(b), staff proposes to add a new section for FCI pathways for light- and medium-duty (LMD) charging sites. This section replaces previous proposed subsection 95486.2(b)(7) and includes the medium-duty portion of the previously proposed section "Medium- and Heavy-Duty Hydrogen Refueling Infrastructure (MHD-HRI) Pathways". Combining the light- and medium-duty vehicles into a single FCI program simplifies credit calculation for the pathway and provides additional credit space for the heavy-duty vehicles in the HD-FCI program. The minimum nameplate capacity for LMD-FCI chargers is proposed to be returned to 50 kW to accommodate different charging demands from light- and medium-duty vehicles. LMD-FCI sites are proposed to be categorized into public and private sites: public stations continue to be credited at 20% of their FCI capacity, while private stations will be credited at 10% their FCI capacity. This provision allows private charging sites to participate in the program, while providing greater incentive to public sites for the same reason listed above for the LMD-HRI program.

Addition of Section 95486.4. Generating and Calculating Credits for ZEV Fueling Infrastructure Pathways for Heavy-Duty Vehicles.

- In section 95486.4(a), staff proposes to modify the section for HRI pathways to apply exclusively to heavy-duty (HD) hydrogen refueling stations. This section was formerly numbered 95486.3(a) and included both medium- and heavy-duty (HD) hydrogen refueling stations. Several of the other proposed changes in section 95486.4 are designed to better-fit HD refueling needs, now that the MD vehicles are grouped with the LD provisions. Terminology is also updated throughout section 95486.4 to reflect the new grouping of MD vehicles with the LD provision.
- 2. In section 95486.4(a)(1), staff proposes to modify the HD-HRI pathway eligibility. The gross vehicle weight accessibility is raised to 14,001 lbs, as medium duty vehicles are now in a separate program. The distance requirement is limited to shared HD-HRI stations and extended to five miles from any ready or pending FHWA Alternative Fuel Corridor. Private stations' distances to corridors are not relevant to the service they provide, while a distance of five miles from a corridor for shared stations provides adequate distance to ensure availability of utility services to stations while still supporting an easily-accessible hydrogen refueling network.
- 3. In section 95486.4(a)(3), staff proposes to modify the HD-HRI application approval process. Participation in the program by a single applicant is limited to 40% of the available credits, ensuring that multiple applicants can participate in the program. There are currently six participants in the HRI program.
- 4. In section 95486.4(a)(4), staff proposes to modify the requirements to generate HRI credits. Staff proposes to clarify in the regulation that only stations available to the public are subject to the accessibility requirements listed in section 95486.4(a)(4), and those stations must only accept fuel cards if the applicant accepts those same fuel

cards at other stations that they operate. Private and shared HD-HRI stations can decide the level of access and payment method that satisfies the service the private and shared HD-HRI stations provide. A shared HD-HRI station cannot be reserved for one HDV fleet for more than 12 hours each day, to ensure that private stations cannot be slightly adjusted to meet shared station requirements without meeting the intent of the shared station provisions. A fleet can continue to use the station after its reservation period is over, but not to the exclusion of other fleets sharing the site. An FSE must dispense hydrogen in a given quarter to generate HRI credits, consistent with the intent stated in the 2018 LCFS Final Statement of Reasons. The initial capital expenditure is specified to exclude on-site generation, land, working capital, and off-site facilities. The "Net CapEx" limit in this section is intended to reimburse the essential elements of a hydrogen refueling station.

- 5. In section 95486.4(b), staff proposes to modify the section for FCI pathways to apply exclusively to HD charging sites. This section was formerly numbered 95486.3(b) and included both MD and HD fast charging stations.
- 6. In section 95486.4(b)(1), staff proposes to modify the HD-FCI pathway eligibility. The gross vehicle weight accessibility is raised to 14,001 lbs, as medium duty vehicles are now in a separate program. The distance requirement is limited to shared HD-FCI sites and extended to five miles from any ready or pending FHWA Alternative Fuel Corridor. Private sites' distances to corridors are not relevant to the service they provide, while a distance of five miles from a corridor for shared sites provides adequate distance to ensure availability of utility services to sites while still supporting the HD EV charging network.
- 7. In section 95486.4(b)(2), staff proposes to modify the HD-FCI application requirements. The limitation on number of chargers is removed, as the limit on total power is sufficient alone to ensure that FCI incentivization is spread across many sites. The total power is increased to 40 MW, as medium-duty vehicles are no longer grouped in this program and heavy-duty charging sites are anticipated to be of this size. Applicants may also use a smaller FCI power rating than the nameplate power capacity for pathway calculation to include more chargers in the program.
- 8. In section 95486.4(b)(3), staff proposes to modify the HD-FCI application approval process. Participation in the program by a single applicant is limited to 20% of the available credits, ensuring that multiple applicants can participate in the program. There are currently 33 participants in the FCI program.
- 9. In section 95486.4(b)(4), staff proposes to modify the requirements to generate FCI credits. Staff proposes to clarify in the regulation that only stations available to the public are subject to the accessibility requirements listed in section 95486.4(b)(4), and those stations must only accept fuel cards if the applicant accepts those same fuel cards at other stations that they operate. Private and shared HD-FCI stations can decide the level of access and payment method that satisfies the service the private and shared HD-FCI stations provide. A shared HD-FCI site cannot be reserved for one HDV fleet for more than 12 hours each day, to ensure that private sites cannot be slightly adjusted to meet shared station requirements without meeting the intent of the shared station provisions. A fleet can continue to use the site after its reservation period is over, but not to the exclusion of other fleets sharing the site. An FSE must dispense electricity in a given quarter to generate FCI credits, consistent with the intent stated in the 2018 LCFS Final Statement of Reasons. The initial capital expenditure is specified to exclude

on-site generation, land, working capital, and off-site facilities. The "Net CapEx" limit in this section is intended to reimburse the essential elements of a fast charging site.

Modifications to Section 95488. Entities Eligible to Apply for Fuel Pathways.

 In subsection 95488(d), staff proposes to give the Executive Officer discretion to stop accepting applications for new fuel pathways for biomass-based diesel starting January 1, 2031, if the number of unique Class 3-8 ZEVs reported or registered with the sources listed exceeds 132,000 ZEVs or near-zero-emission-vehicles (NZEV) on December 31, 2029. This threshold was derived from the CARB Strategy for the State Implementation Plan and reflects full implementation of the State's MHD ZEV regulations. The proposal does not phase out existing biomass-based diesel fuel pathways, which may still report under their previously-certified Cls.

Modifications to Section 95488.1. Fuel Pathway Classifications.

- 2. In subsection 95488.1(b)(1), staff proposes to remove Fossil Jet Fuel receiving a Lookup Table Pathway. This proposed modification is necessary for consistency with the proposed modifications to subsections 95482(a) and 95482(c) discussed above.
- 3. In subsection 95488.1(d)(4), staff proposes to add "alcohol to hydrocarbons" to the illustrative list of drop in fuels, in order to clarify that drop in fuels include hydrocarbon fuels (e.g., sustainable aviation fuel (SAF)) derived from alcohols. An alcohol to hydrocarbon pathway such as converting starch and cellulosic ethanol to jet fuel is one potential method of producing SAF.

Modifications to Section 95488.3. Calculation of Fuel Pathway Carbon Intensities.

- In section 95488.3(b), staff proposes to specify a process by which the Executive Officer may correct the Tier 1 CI Calculators if necessary to conform the methodological consistency of the calculator to the CA-GREET4.0 model. This proposed change is necessary to facilitate modeling consistency and efficiency in the implementation of the simplified modeling tools.
- 2. In section 95488.3(d), Table 6, staff proposes to add specification of the geographic region to Table 6 identifying where land use change (LUC) carbon intensity was modeled for specific feedstock/fuel combinations. Table 6 LUC values were estimated through the GTAP and AEZ-EF modeling framework developed by CARB with input from an expert working group in 2010 and were updated during CARB's re-adoption of the LCFS program in 2015. GTAP uses economic and trade data to model the land requirements—i.e., the amount of forest, pasture, and cropland converted—to meet an increase in biofuel demand. It estimates these market-mediated land conversions within a focal region (i.e., domestic LUC) and elsewhere (i.e., world-wide LUC), which are used as inputs for the AEZ-EF model to estimate the associated GHG emissions based on regional carbon stocks. LUC carbon intensity for feedstocks from regions other than the regions modeled may not be equivalent with the Table 6 values for those feedstocks shown. The LUC carbon intensity of a given crop feedstock may vary widely based on land use practices and local carbon stocks in the region where it is produced.

To reflect this variability, staff proposes to incorporate a mechanism to assign more conservative LUC carbon intensity values to feedstock/fuel combinations from regions with higher LUC risk. This proposal is informed by the increasing number of fuel pathway applications CARB has received involving crop-based feedstocks from regions

other than those previously modeled in 2015 that may not demonstrate equivalency with Table 6 values. Staff's proposal aims to provide more granularity to LUC carbon intensity values. For feedstock/fuel combinations from regions not listed in the updated Table 6, staff proposes to conduct an empirical assessment to determine a conservative LUC value based on historical land conversions for a given feedstock. The empirical/regional LUC carbon intensity of a given feedstock/fuel combination will be compared to its respective modeled/global LUC carbon intensity value in Table 6, and the more conservative value will be assigned, as regional LUC is a subset of total LUC.

Modifications to Section 95488.6. Tier 1 Fuel Pathway Application Requirements and Certification Process.

 In subsection 95488.6(a)(3), staff proposes to reference sustainability requirements for fuel pathways utilizing biomass feedstocks or process energy. This proposed modification is necessary to support consistency with the proposed modifications to subsection 95488.9(g).

Modifications to Section 95488.7. Tier 2 Fuel Pathway Application Requirements and Certification Process.

 In subsection 95488.7(a)(4), staff proposes to add a requirement to include documentation that sustainability requirements have been met for fuel pathways utilizing biomass feedstocks or process energy for applicable Tier 2 fuel pathway applications. This proposed modification is necessary to support consistency with the proposed modifications to subsection 95488.9(g).

Modifications to Section 95488.8. Fuel Pathway Application Requirements Applying to All Classifications.

- In subsection 95488.8(g)(1)(A)3., staff proposes to include forest waste biomass feedstocks as a specified source feedstock. This provides greater specificity on feedstock eligibility requested by stakeholders and helps to promote forest waste biomass use from high-priority wildfire fuel reduction and forest restoration treatments.
- 2. In subsection 95488.8(g)(1)(A)4., staff proposes to clarify that only the organic portion of municipal solid waste diverted from landfill disposal is considered a specified source feedstock. Organic waste has always been the intent of this provision, and plastics to fuels are not incentivized by the program. Staff also proposes to delete text in the definitions that differentiated plastics from petroleum products. These two changes clarify that the plastic portion of MSW is treated as a fossil feedstock in any pathway analysis and ensures that plastics feedstocks from diverted waste are not incentivized for fuels.
- 3. In subsection 95488.8(i)(1)(A), staff proposes to remove unnecessary text related to hydrogen. The deleted text is unnecessary because the requirements for book-and-claim of low-CI electricity for hydrogen are covered in subsection (C).
- 4. In subsection 95488.8(i)(1)(C), staff proposes to add the word "electrolytic" to clarify the type of hydrogen production to which this subsection applies. Staff also proposes to harmonize the matching period for book-and-claim accounting for low-CI electricity for direct air capture projects or electrolytic hydrogen used as a transportation fuel, with the matching period for electricity used as a transportation fuel.

5. In subsection 95488.8(i)(2), staff proposes to modify deliverability requirements for book-and-claim accounting for biomethane. The modification adds a condition that if the Executive Officer approves a gas system map identifying interstate pipelines and their majority directional flow based on specified flow data by July 1, 2026, pathways for bio-CNG, bio-LNG, and bio-L-CNG combustion in vehicles would need to demonstrate physical flow to California after December 31, 2037.

Modifications to Section 95488.9. Special Circumstances for Fuel Pathway Applications.

- 1. In subsection 95488.9(f)(3)(A), for projects breaking ground before January 1, 2030, staff proposes to reduce the total number of crediting periods for avoided methane emissions crediting periods to two, rather than three. This proposed change aligns more closely with the end-dates for avoided methane pathways that break ground after December 31, 2029, which was proposed in the Staff Report³, while still providing an incentive to develop methane capture projects. The proposed modifications to the proposed credit true-up concept in subsection 95488.10(b) described below ensure sufficient return on investment for fuel pathways reporting using temporary fuel pathways during the pathway certification process.
- 2. In section 95488.9(g), staff proposes to add details to the proposal on biomass sustainability requirements. Staff proposes a phase-in approach for sustainability requirements that supports reducing any deforestation and other land conversion risks in the near term and increases the use of sustainably sourced biomass in the long term. In response to stakeholder requests for more specific definitions of sustainability criteria, staff propose criteria in subsections 95488.9(g)(1)(A) through (B). Third-party certification will still be required to demonstrate compliance with these criteria.

Staff proposes to require sustainability certification from point-of-origin up to the first gathering point which is now defined in section 95481(a). First gathering points may typically manage data for multiple farms or plots and staff proposes to focus on first gathering points as the point of regulation to make data collection and certification more feasible.

Proposed subsection 95488.9(g)(1)(A) encompasses the initial requirement from the 45-day proposal that crop- and forest-based feedstocks not be sourced on land that was forested after 2008. This requirement has been expanded to include protections for other carbon-rich and biodiverse ecosystems (e.g., native grasslands, wetlands) by requiring that all biomass used in fuel pathways be sourced from land that was cleared or cultivated prior to 2008. Staff's definition of biomass includes crop- and forestry-based feedstocks used for finished fuel or process energy. The other sustainability criteria outlined in subsection 95488.9(g)(1)(B) includes environmental best management practices that are included in many third--party certification schemes.

In response to stakeholder comments about the challenges of supply chain complexity, traceability, and certification requirements, staff proposes a phase-in approach to sustainability requirements as outlined in subsections 95488.9(g)(2) through (4). The first milestone beginning in 2026 is for fuel producers to collect and submit supply chain

³ California Air Resources Board, *Staff Report: Initial Statement of Reasons: Public Hearing to Consider the Proposed Amendments to the Low Carbon Fuel Standard.* December 19, 2023. *https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/isor.pdf*

data including spatial data of farm boundaries where feedstocks are sourced. Additionally, fuel producers must maintain an attestation letter signed by the fuel producer that assures feedstocks have not been sourced from lands that were converted after 2008.

The next milestone beginning in 2028 is for fuel producers to obtain third-party certification that, at a minimum, ensures feedstocks are not sourced on lands converted after 2008. Staff proposes that the list of certification schemes recognized by the European Union Renewable Energy Directive (EU RED), which contain no-deforestation/no-conversion requirements, be accepted for these purposes. Other certification schemes that meet the criteria listed in subsection 95488.9(g)(5) will also be considered for approval by the Executive Officer. The final milestone beginning in 2031 requires full sustainability certification of all biomass feedstocks or process energy by a third-party approved by the EO.

The proposed phase-in approach outlined above will be accompanied by matching consistency changes to recordkeeping and verification requirements in sections 95491.1 and 95501 respectively mentioned below.

Modifications to Section 95488.10. Maintaining Fuel Pathways.

- In subsection 95488.10(a)(7), staff proposes modifications to the scope of the process when the verified operational CI is found to be greater than the certified CI of a fuel pathway, to specify that verified operational CIs that exceed the CI of temporary fuel pathways are subject to the same requirements and process as Tier1/Tier 2 fuel pathways, including credit invalidation and potential enforcement action.
- 2. In subsection 95488.10(b), staff proposes to expand the credit true up to include periods using temporary pathway CIs after annual verification. Staff received numerous comments from stakeholders highlighting the benefits of the credit true up of temporary fuel pathways. The proposal enables the eventual recovery of credits based on verified operational data, which may be especially beneficial for pathways which involve a large variation in the CI scores in the normal course of project operation. The modifications are expected to help streamline the application review process, alleviate or mitigate any business impacts associated with a delay in pathway certification and allows for recognition for the full amount of climate benefit of a fuel.

Modifications to Section 95489. Provisions for Petroleum-Based Fuels.

- In section 95489(a), staff proposes to remove fossil jet fuel from the deficit calculation. This proposed modification is necessary for consistency with the proposed modifications to subsections 95482(a) and 95482(c) discussed above.
- 2. In section 95489(a), staff proposes to correct the California Baseline Crude Average and the Three-year California Crude Average carbon intensity values. This is a correction of errors in the 45-day package, and no new calculations have occurred.
- 3. In section 95489(a), staff proposes to update the Annual Crude Average carbon intensity value for 2022. This update is necessary to align the years for the annual crude average with the implementation timeline of these regulatory amendments.
- 4. In section 95489(b), staff proposes to remove fossil jet fuel from incremental deficits. This proposed modification is necessary for consistency with the proposed modifications to subsections 95482(a) and 95482(c) discussed above.

- 5. In section 95489(b), Table 9, staff proposes to modify the CI Lookup Table for Crude Oil Production and Transport. This is a correction of errors in the 45-day package, and no new calculations have occurred. This correction also aligns the years for the annual crude average with the implementation timeline of this regulatory amendment.
- 6. In section 95489(c)(1)(F), staff proposes to update the Emission Factor for the innovative crude credit calculation, aligning with the updated Emission Factors in proposed CA-GREET 4.0 model.
- 7. In subsection 95489(e)(1)(B), staff proposes to clarify that sequestration sites for CCS do not need to be on-site at the hydrogen production facility within the Refinery Investment Credit Program.
- 8. In subsection 95489(e)(1)(D)3., staff proposes to clarify that lower-CI process energy must be physically supplied to refineries within the Refinery Investment Credit Program. This is a clarification for eligible lower-CI process energy, and it is consistent with Section 95489(c)(1) in terms of the necessity of using process energy to be physically supplied to production facilities.

Modifications to Section 95491. Fuel Transactions and Compliance Reporting.

- In section 95491(b)(2), staff proposes to define the process by which an entity that misses the quarterly reporting deadline may receive a percentage of the credits that would have been generated by a timely submission. Since this is a market program that needs timely data, an entity can only miss up to 3 days past the reporting deadline to receive any credits for the previous quarter.
- In section 95491(d)(1), staff proposes to remove Fossil Jet Fuel from reporting requirements for the Quarterly Fuel Transaction Reports. This proposed modification is necessary for consistency with the proposed modifications to subsections 95482(a) and 95482(c) discussed above.
- 3. In subsection 95491(d)(3)(B)3., staff proposes to remove the requirement that entities reporting under a smart charging pathway retain records demonstrating that the fuel supply equipment was enrolled in a time of use rate plan during the reporting period, if offered by the load serving entity. This requirement is unnecessary and adds administrative burden to the smart-charging pathway, which has been underutilized since its adoption in 2018.
- 4. In subsection 95491(d)(3)(E), staff proposes to modify the reporting requirements for electric forklifts. The new metered reporting requirements are delayed to 2026 reporting to allow time for FSE owners to acquire metering equipment and implement metering procedures. Reporters can continue to use existing reporting methodologies for the 2025 reporting period.
- 5. In subsection 95491(e)(5)(A)4., staff proposes to add reporting requirements for OEMs receiving base credits. These reporting requirements are similar to reporting requirements under the holdback equity spending provisions, and require submission of a report documenting the monetary value of LCFS credit proceeds, detailed information about costs associated with each program, and a report of implemented projects.
- 6. In section 95491(h), Table 11, staff proposes to remove "Fossil Jet Fuel Blends" from the Quarterly and Annual Reporting Requirements checklist. This proposed modification

is necessary for consistency with the proposed modifications to subsections 95482(a) and 95482(c) discussed above.

7. In section 95491(h), Table 12, staff proposes to correct an error in the deadline for annual reports for Low-Complexity/Low-Energy-Use Refinery from the Annual Compliance Calendar.

Modifications to Section 95491.1. Recordkeeping and Auditing.

- 1. In subsection 95491.1(a)(2)(I), staff proposes to modify the record retention requirements for fuel pathway holders and applicants that utilize biomass feedstocks or process energy. This proposed modification is necessary to be consistent with the proposed modifications to subsection 95488.9(g).
- In subsection 95491.1(c)(2), staff proposes to modify the monitoring plan requirements for fuel pathway holders and applicants that utilize biomass feedstocks or process energy. This proposed modification is necessary to be consistent with the proposed modifications to subsection 95488.9(g).
- 3. In section 95491.1(d), staff proposes to explicitly state that lack of a verification statement submitted by the deadline will result in Executive Officer investigation and possible enforcement action. Staff also proposes to clarify that the verification outcomes apply to all LCFS report types subject to verification.

Modifications to Section 95491.2. Measurement Accuracy and Data Provisions.

1. In subsection 95491.2(b)(2)(B), staff proposes to modify the missing data substitution methodologies to ensure that the methodologies in Table 13 are only used when they result in a reasonable or conservative data replacement; otherwise, an Executive Officer approved alternative method must be used.

Modifications to Section 95495. Authority to Suspend, Revoke, Modify, or Invalidate.

 In subsection 95495(b)(2), staff proposes to use the term "LCFS data management system" rather than "LRT-CBTS" for sending a notice to a regulated party when determining a credit/deficit calculation, or that a certified CI is invalid. Determinations can be made for various reasons such that notifications may best align with different elements of the functionality designs for the LCFS data management system (AFP and LRT-CBTS). Therefore, it is most appropriate to specify the LCFS data management system instead of the LRT-CBTS.

Modifications to Section 95500. Requirements for Validation of Fuel Pathway Applications; and Verification of Annual Fuel Pathway Reports, Quarterly Fuel Transaction Reports, Crude Oil Quarterly and Annual Volume Reports, Project Reports, and Low-Complexity/Low-Energy-Use Refinery Reports.

- In subsection 95500(c)(A), staff proposes to remove Fossil Jet Fuel used for intrastate flight for verification of quarterly fuel transaction reports applicability. This proposed modification is necessary for consistency with the proposed modifications to subsections 95482(a) and 95482(c) discussed above.
- 2. In subsection 95500(c)(F), staff proposes to remove redundant text regarding the requirement that fuel cell vehicle fueling for hydrogen produced from biomethane supplied using book-and-claim accounting be subject to quarterly fuels transactions verification.

Modifications to Section 95501. Requirements for Validation and Verification Services.

- In subsection 95501(b)(4)(F), staff proposes to add biomass feedstocks or process energy to the verification services sampling plan requirements. CARB verifiers must include in their scope of verification services review of biomass feedstocks or process energy to be consistent with the proposed modifications under subsection 95488.9(g).
- In subsection 95501(h), staff proposes to remove the condition that growth in total reported electricity reporting be less than 25% year to year to be eligible for less-intensive verification. This proposed change reflects the rapid anticipated growth in electric vehicle charging expected in California.

Modifications to Section 95503. Conflict of Interest Requirements for Verification Bodies and Verifiers.

- 1. In subsection 95503(b)(2)(A), staff proposes to modify the organizational and individual high potential conflict of interest conditions and expand the exclusion provision for high COI for verifiers who participate in other federal or state low carbon fuel programs. Accordingly, staff proposes to expand the inclusion provision for low COI. Over the past few years, low carbon fuel programs have been created for various states and federal agencies that have utilized, or plan on utilizing, third-party verifiers who have passed California's LCFS verifier accreditation training. For example, the U.S. Department of the Treasury, the State of Oregon, and the State of Washington are using LCFS verifiers for their programs. The regulation is proposed to be updated so that third-party verifies who do auditing work for regulatory programs by other governmental agencies are not conflicted out and are still able to provide verification services for California's LCFS program.
- 2. In section 95503(c), staff proposes to modify the low conflict of interest conditions and expand the exclusion provision for high COI for verifiers who participate in other federal or state low carbon fuel programs. Accordingly, staff proposes to expand the inclusion provision for low COI. Over the past few years, low carbon fuel programs have been created for various states and federal agencies that have utilized, or plan on utilizing, third-party verifiers who have passed California's LCFS verifier accreditation training. For example, the U.S. Department of the Treasury, the State of Oregon, and the State of Washington are using LCFS verifiers for their programs. The regulation is proposed to be updated so that third-party verifies who do auditing work for regulatory programs by other governmental agencies are not conflicted out and are still able to provide verification services for California's LCFS program.

In addition to the modifications described above, additional modifications correcting grammar, punctuation and spelling have been made throughout the proposed changes. These changes are nonsubstantive.

These modifications do not change implementation of the regulation in any way that change the conclusions of the environmental analysis included in the Staff Report because **the modifications consist of provision clarifications, minor revisions removing certain proposals, such as removing jet fuel as a required fuel, and updated modeling, which does not alter the compliance responses such that the significance determinations change.** These revisions have not shown any new, substantial environmental impacts, any substantial increases in the severity of an environmental impact, or any alternative or mitigation measure considerably different from those considered in the Draft EIA. Therefore, no additional environmental analysis is required. Rather, the revisions update the project description, and in response to public comment, additional information has been added to the Draft EIA to analyze herd size as a compliance response and clarify the air quality and GHG analysis. As a result, CARB has determined this resulted in the addition of substantial new information compared to what was presented in the Draft EIA. Therefore, CARB has determined that recirculation of the project description and the air quality and GHG evaluations is warranted. CARB will be recirculating those sections and accepting new comments on only the portions of the Draft EIA included in this recirculation.

Additional Documents and Incorporated Document(s) Added to the Record

In the interest of completeness and in accordance with Government Code section 11347.1, subdivision (a), staff has also added to the rulemaking record and invites comments on the following additional documents.

Documents Incorporated by Reference

- 1. California-modified Greenhouse Gases, Regulated Emissions, and Energy use in Transportation version 4.0 (CA-GREET4.0) model, August 12, 2024
- 2. CA-GREET4.0 Lookup Table Pathways Technical Support Documentation, August 12, 2024
- 3. Tier 1 Simplified CI Calculator for Biodiesel, August 12, 2024
- 4. Tier 1 Simplified CI Calculator for Biodiesel Instruction Manual, August 12, 2024
- 5. Tier 1 Simplified CI Calculator for Corn or Sorghum Ethanol, August 12, 2024
- 6. Tier 1 Simplified CI Calculator for Corn or Sorghum Ethanol Instruction Manual, August 12, 2024
- 7. Tier 1 Simplified CI Calculator for Dairy and Swine Manure Biomethane, August 12, 2024
- 8. Tier 1 Simplified CI Calculator for Dairy and Swine Manure Biomethane Instruction Manual, August 12, 2024
- 9. Tier 1 Simplified CI Calculator for Hydrogen, August 12, 2024
- 10. Tier 1 Simplified CI Calculator for Hydrogen Instruction Manual, August 12, 2024
- 11. Tier 1 Simplified CI Calculator for Hydroprocessed Ester and Fatty Acid Fuels, August 12, 2024
- 12. Tier 1 Simplified CI Calculator for Hydroprocessed Ester and Fatty Acid Fuels Instruction Manual, August 12, 2024
- 13. Tier 1 Simplified CI Calculator for Landfill Biomethane, August 12, 2024
- 14. Tier 1 Simplified CI Calculator for Landfill Biomethane Instruction Manual, August 12, 2024
- 15. Tier 1 Simplified CI Calculator for Organic Waste Biomethane, August 12, 2024
- 16. Tier 1 Simplified CI Calculator for Organic Waste Biomethane Instruction Manual, August 12, 2024
- 17. Tier 1 Simplified CI Calculator for Sugarcane Ethanol, August 12, 2024
- 18. Tier 1 Simplified CI Calculator for Sugarcane Ethanol Instruction Manual, August 12, 2024
- 19. Tier 1 Simplified CI Calculator for Wastewater Sludge Biomethane, August 12, 2024
- 20. Tier 1 Simplified CI Calculator for Wastewater Sludge Biomethane Instruction Manual, August 12, 2024
- 21. Hydrogen Fueling Capacity (HyCap) Model. August 12, 2024

- 22.ISO 14064-3:2019(E), Greenhouse gases Part 3: Specification with guidance for the verification and validation of greenhouse gas statements
- 23.ISO 14065:2020(E), General principles and requirements for bodies validating and verifying environmental information
- 24. ISO 14066:2023(E), Environmental information Competence requirements for teams validating and verifying environmental information
- 25. ISO/IEC 17065:2012(E), Conformity assessment Requirements for bodies certifying products, processes and services

Additional References and Supplemental Documents

- 1. Ansar, Jasmin Ph.D. and Roger Sparks, Ph.D. 2014. *Increasing Market Competition to Reduce the Level and Variability of Transportation Fuel Prices: A Case Study on California's Low Carbon Fuel Standard*. Natural Resources Defense Council. Available at *https://www.nrdc.org/sites/default/files/ene_14040101a.pdf*
- 2. ARCHES H2. California's renewable hydrogen hub officially launches. July 17, 2024. Available at https://archesh2.org/arches-officially-launches/
- 3. Bates and White. Low Carbon Fuels Standards Market Impacts and Evidence for Retail Fuel Price Effects. April 2022. Available at https://www.bateswhite.com/media/publication/226_BW LCF Report - April 2022.pdf
- Brito, L.F. et al. Review: Genetic selection of high-yielding dairy cattle toward sustainable farming systems in a rapidly changing world, Animal, Volume 15, Supplement 1, 2021, 100292, ISSN 1751-7311. https://doi.org/10.1016/j.animal.2021.100292
- 5. Cai, H., Wang, M., Elgowainy, A., & Han, J., Updated Greenhouse Gas and Criteria Air Pollutant Emission Factors of the U.S. Electric Generating Units in 2010. September 2013. https://greet.es.anl.gov/publication-electricity-13
- 6. California Air Resources Board, Appendix B-2: Technical Support Documentation for Lookup Table Pathways, Proposed Amendments for the Low Carbon Fuel Standard Regulation. August 12, 2024.
- California Air Resources Board, California Dairy Sector Workshop. August 22, 2024. PowerPoint Presentation. Released August 2, 2024. Available at https://ww2.arb.ca.gov/sites/default/files/2024-08/CARB_Dairy_Sector_Workshop_Staff_Presentation_08-22-2024.pdf
- California Air Resources Board, CA-GREET3.0 Supplemental Document and Tables of Changes. August 13, 2018. Accessed on October 15, 2023. https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/cagreet/cagreet_supp_doc_clean.pdf?_ga=2.249502272.611476356.1694443979-877253845.1694124606
- 9. California Air Resources Board, CA-GREET4.0 Inputs Tab (Proposed Rulemaking Version). Released August 12, 2024. https://ww2.arb.ca.gov/resources/documents/lcfs-life-cycle-analysis-public-comment
- 10. California Air Resources Board, CA-GREET4.0 Natural Gas Tab (Proposed Rulemaking Version). Released August 12, 2024. https://ww2.arb.ca.gov/resources/documents/lcfs-life-cycle-analysis-public-comment
- 11. California Air Resources Board, CA-GREET4.0 Results Tab, LPGV Section (Proposed Rulemaking Version). Released August 12, 2024. https://ww2.arb.ca.gov/resources/documents/lcfs-life-cycle-analysis-public-comment
- 12. California Air Resources Board, CA-GREET4.0 Supplemental Document. August 12, 2024.

- 13. California Air Resources Board. *California's 2000-2014 Greenhouse Gas Emission Inventory Technical Support Document 2016 Edition*. September 2016. Available at *https://ww2.arb.ca.gov/sites/default/files/classic/cc/inventory/ghg_inventory_tsd_00-14.pdf*
- 14. California Air Resources Board, *Compliance Offset Protocol Livestock Projects Capturing and Destroying Methane from Manure Management Systems*. Adopted on November 14, 2014.

https://www.arb.ca.gov/regact/2014/capandtrade14/ctlivestockprotocol.pdf

- 15. California Air Resources Board, Greenhouse Gas Emissions Analysis Workbook from ISOR. May 10, 2024. Excel Spreadsheet. Available at https://ww2.arb.ca.gov/sites/default/files/2024-05/GHG%20Calculations%20ISOR_posted.xlsx
- 16. California Air Resources Board, Modeling Input Sheets from 15-Day Proposal for Baseline Scenario. August 12, 2024. Excel Spreadsheet.
- 17. California Air Resources Board, Greenhouse Gas Emissions Analysis Workbook for the 15-day Changes. August 12, 2024. Excel Spreadsheet.
- 18. California Air Resources Board, *Greenhouse Gas Emissions Inventory*. Accessed on October 25, 2023. https://arb.ca.gov/emfac/emissions-inventory
- 19. California Air Resources Board. CARB Landfill Gas Tool. Updated September 24, 2021. Available at https://ww2.arb.ca.gov/resources/documents/carbs-landfill-gas-tool
- 20. California Air Resources Board, LCFS Amendments Air Quality Calculations for the Proposed Scenario from ISOR. April 9, 2024. Excel Spreadsheet. Available at https://ww2.arb.ca.gov/sites/default/files/2024-04/Proposed%20scenario%20air%20guality%20workbook.xlsx
- 21. California Air Resources Board, LCFS Amendments Air Quality Calculations for the EJAC Scenario from ISOR. April 9, 2024. Excel Spreadsheet. Available at https://ww2.arb.ca.gov/sites/default/files/2024-04/EJAC%20scenario%20air%20guality%20workbook.xlsx
- 22. California Air Resources Board, LCFS Amendments Air Quality Calculations for 15-day Proposal. August 12, 2024. Excel Spreadsheet.
- 23. California Air Resources Board, *LCFS Fuels and Credit Market Monitoring*. August 12, 2024.
- 24. California Air Resources Board, *LCFS Quarterly Data Summary Spreadsheet*. April 2024. Excel Spreadsheet. Available at https://ww2.arb.ca.gov/sites/default/files/2024-04/guarterlysummary Q42023.xlsx
- 25. California Air Resources Board, Low Carbon Fuel Standard (LCFS) Guidance 20-01 Fuel Production Facility and Intermediate Facility Registration in the Alternative Fuels Portal. February 2020. https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/guidance/lcfsguidance_20-01.pdf
- 26. California Air Resources Board, Method for Estimating Greenhouse Gas Emission Reductions from Diversion of Organic Waste from Landfills to Compost Facilities Final Draft. May 2017.
- 27. California Air Resources Board, Modeling Input Sheets from 15-Day Proposal for Proposed Scenario. August 12, 2024. Excel Spreadsheet.
- 28. California Air Resources Board, Modeling Input Sheets from 15-Day Proposal for Scenario 1 Proposed with 2028 AAM. August 12, 2024. Excel Spreadsheet.
- 29. California Air Resources Board, Modeling Input Sheets from 15-Day Proposal for Scenario 2 75% of ZEV Development. August 12, 2024. Excel Spreadsheet.

- 30. California Air Resources Board, Modeling Input Sheets from 15-Day Proposal for Scenario 3 Froze RD. August 12, 2024. Excel Spreadsheet.
- California Air Resources Board, Modeling Input Sheets from 15-Day Proposal for Scenario 4 – 75% of ZEV Development and Froze RD. August 12, 2024. Excel Spreadsheet.
- 32. California Air Resources Board, Modeling Input Sheets from April 10, 2024 Workshop for Updated Proposed Scenario with 5% step-down. April 9, 2024. Excel Spreadsheet. Available at https://ww2.arb.ca.gov/sites/default/files/2024-04/scenario_inputs_15Day_Proposed_5percent%20step%20down.xlsx
- 33. California Air Resources Board, Modeling Input Sheets from April 10, 2024 Workshop for Updated Proposed Scenario with 5% step-down and 2 AAM triggers. April 9, 2024. Excel Spreadsheet. Available at https://ww2.arb.ca.gov/sites/default/files/2024-04/scenario inputs 15Day Proposed 5percent%20step%20down%202%20AAM.xlsx
- 34. California Air Resources Board, Modeling Input Sheets from April 10, 2024 Workshop for Updated Proposed Scenario with 7% step-down. April 9, 2024. Excel Spreadsheet. Available at https://ww2.arb.ca.gov/sites/default/files/2024-04/scenario inputs 15Day Proposed 7percent%20step%20down.xlsx
- 35. California Air Resources Board, Modeling Input Sheets from April 10, 2024 Workshop for Updated Proposed Scenario with 9% step-down. April 9, 2024. Excel Spreadsheet. Available at https://ww2.arb.ca.gov/sites/default/files/2024-04/scenario_inputs_15Day_Proposed_9percent%20step%20down.xlsx
- 36. California Air Resources Board, Modeling Input Sheets from ISOR for Accelerated Decarbonization Scenario. April 9, 2024. Excel Spreadsheet. Available at https://ww2.arb.ca.gov/sites/default/files/2024-04/scenario_inputs_ISOR_Accel.xlsx
- 37. California Air Resources Board, Modeling Input Sheets from ISOR for Alternative 1. April 9, 2024. Excel Spreadsheet. Available at https://ww2.arb.ca.gov/sites/default/files/2024-04/scenario_inputs_ISOR_Alt1.xlsx
- 38. California Air Resources Board, Modeling Input Sheets from ISOR for Alternative 2. April 9, 2024. Excel Spreadsheet. Available at https://ww2.arb.ca.gov/sites/default/files/2024-04/scenario_inputs_ISOR_Alt2.xlsx
- 39. California Air Resources Board, Modeling Input Sheets from ISOR for Baseline Scenario. April 9, 2024. Excel Spreadsheet. Available at https://ww2.arb.ca.gov/sites/default/files/2024-04/scenario_inputs_ISOR_Baseline.xlsx
- 40. California Air Resources Board, Modeling Input Sheets from ISOR for EJAC Scenario. April 9, 2024. Excel Spreadsheet. Available at https://ww2.arb.ca.gov/sites/default/files/2024-04/scenario_inputs_ISOR_EJAC.xlsx
- 41. California Air Resources Board, Modeling Input Sheets from ISOR for Proposed Scenario. April 9, 2024. Excel Spreadsheet. Available at https://ww2.arb.ca.gov/sites/default/files/2024-04/scenario_inputs_ISOR_Proposed.xlsx
- 42. California Air Resources Board, Modeling Output Sheets from 15-Day Proposal for Baseline Scenario. August 12, 2024. Excel Spreadsheet.
- 43. California Air Resources Board, Modeling Output Sheets from 15-Day Proposal for Proposed Scenario. August 12, 2024. Excel Spreadsheet.
- 44. California Air Resources Board, Modeling Output Sheets from 15-Day Proposal for Scenario 1 Proposed with 2028 AAM. August 12, 2024. Excel Spreadsheet.
- 45. California Air Resources Board, Modeling Output Sheets from 15-Day Proposal for Scenario 2 75% of ZEV Development. August 12, 2024. Excel Spreadsheet.
- 46. California Air Resources Board, Modeling Output Sheets from 15-Day Proposal for Scenario 3 Froze RD. August 12, 2024. Excel Spreadsheet.

- 47. California Air Resources Board, Modeling Output Sheets from 15-Day Proposal for Scenario 4 75% of ZEV Development and Froze RD. August 12, 2024. Excel Spreadsheet.
- 48. California Air Resources Board, Modeling Output Sheets from April 10, 2024 Workshop for Updated Proposed Scenario with 5% step-down. April 9, 2024. Excel Spreadsheet. Available at https://ww2.arb.ca.gov/sites/default/files/2024-04/15Day Proposed 5percent%20step%20down.xlsx
- 49. California Air Resources Board, Modeling Output Sheets from April 10, 2024 Workshop for Updated Proposed Scenario with 5% step-down and 2 AAM triggers. April 9, 2024. Excel Spreadsheet. Available at https://ww2.arb.ca.gov/sites/default/files/2024-04/15Day_Proposed_5percent%20step%20down%202%20AAM.xlsx
- 50. California Air Resources Board, Modeling Output Sheets from April 10, 2024 Workshop for Updated Proposed Scenario with 7% step-down. April 9, 2024. Excel Spreadsheet. Available at https://ww2.arb.ca.gov/sites/default/files/2024-04/15Day_Proposed_7percent%20step%20down.xlsx
- 51. California Air Resources Board, Modeling Output Sheets from April 10, 2024 Workshop for Updated Proposed Scenario with 9% step-down. April 9, 2024. Excel Spreadsheet. Available at https://ww2.arb.ca.gov/sites/default/files/2024-04/15Day_Proposed_9percent%20step%20down.xlsx
- 52. California Air Resources Board, Modeling Output Sheets from ISOR for Accelerated Decarbonization Scenario. April 9, 2024. Excel Spreadsheet. Available at https://ww2.arb.ca.gov/sites/default/files/2024-04/ISOR_Accel_output.xlsx
- 53. California Air Resources Board, Modeling Output Sheets from ISOR for Alternative 1. April 9, 2024. Excel Spreadsheet. Available at https://ww2.arb.ca.gov/sites/default/files/2024-04/ISOR Alt1 output 0.xlsx
- 54. California Air Resources Board, Modeling Output Sheets from ISOR for Alternative 2. April 9, 2024. Excel Spreadsheet. Available at https://ww2.arb.ca.gov/sites/default/files/2024-04/ISOR Alt2 output.xlsx
- 55. California Air Resources Board, Modeling Output Sheets from ISOR for Baseline Scenario. April 9, 2024. Excel Spreadsheet. Available at https://ww2.arb.ca.gov/sites/default/files/2024-04/ISOR Baseline output.xlsx
- 56. California Air Resources Board, Modeling Output Sheets from ISOR for EJAC Scenario. April 9, 2024. Excel Spreadsheet. Available at https://ww2.arb.ca.gov/sites/default/files/2024-04/ISOR EJAC output 0.xlsx
- 57. California Air Resources Board, Modeling Output Sheets from ISOR for Proposed Scenario. April 9, 2024. Excel Spreadsheet. Available at https://ww2.arb.ca.gov/sites/default/files/2024-04/ISOR Proposed output.xlsx
- 58. California Air Resources Board, Public Workshop Notice. April 10, 2024. Available at https://content.govdelivery.com/accounts/CARB/bulletins/392bca9
- 59. California Air Resources Board, Staff Report: Initial Statement of Reasons: Public Hearing to Consider the Proposed Amendments to the Low Carbon Fuel Standard. December 19, 2023.

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

60. California Air Resources Board. *Staff Report: Initial Statement of Reasons Public Hearing to Consider the Proposed Amendments to the Low Carbon Fuel Standard.* December 19, 2023. Available at

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

61. California Air Resources Board, State and Local Sales Tax Spreadsheet. 2024. Excel Spreadsheet.

- 62. California Air Resources Board, Supplemental 2023 LCFS ISOR Documentation. April 9, 2024. https://ww2.arb.ca.gov/resources/documents/supplemental-2023-lcfs-isordocumentation
- 63. California Air Resources Board, *Underlying Data from ISOR Figures*. Spreadsheet. March 7, 2024. Available at *https://ww2.arb.ca.gov/sites/default/files/2024-04/isor_figures.xlsx*
- 64. California Department of Finance. Demographic Research Unit. Report P-3: Population Projections, California, 2020-2060 (Baseline 2019 Population Projections; Vintage 2023 Release). Sacramento: California. March 2024. Excel Spreadsheet
- 65. California Department of Finance. Economic Research Unit. California Economic Forecast Annual & Quarterly. Sacramento: California. May 2024. Excel Spreadsheet.
- 66. California Department of Finance. Economic Research Unit. National Deflators: Calendar Year averages. Sacramento: California. May 2024. Excel Spreadsheet.
- 67. California Department of Finance. Economic Research Unit. National Economic Forecast – Annual & Quarterly. Sacramento: California. May 2024. Excel Spreadsheet.
- 68. California Department of Finance. *Major Regulations*. January 2023. Available at *https://dof.ca.gov/forecasting/economics/major-regulations/*
- 69. California Department of Resources Recycling and Recovery. 2021 Disposal Facility-Based Waste Characterization Data Tables. November 2022.
- 70. California Energy Commission, 2020 Total System Electric Generation. Accessed on October 27, 2023. https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2021-total-system-electric-generation/2020
- 71. California Energy Commission, Additional Analysis on Gasoline Prices in California. October 21, 2019. Available at https://www.energy.ca.gov/sites/default/files/2019-11/Gas_Price_Report.pdf
- 72. California Energy Commission, *Natural Gas Resource Areas and Interstate Pipelines into California*. Accessed February 7, 2018.
- 73. California Energy Commission, Planned Maintenance and Gasoline Prices. Presentation. June 6, 2024. *https://efiling.energy.ca.gov/GetDocument.aspx?tn=256725*
- 74. California Energy Commission, *Propane Vehicles*. Accessed on February 9, 2018.
- 75. California Energy Commission. Refiner Margin Data. Spreadsheet. June 24, 2024. Available at *https://www.energy.ca.gov/media/9163*
- 76. California Energy Commission, *Supply and Demand of Natural Gas in California*. Accessed February 7, 2018.
- 77. California ISO, CAISO Peak Demand Forecast OASIS Prod PUBLIC 1. Accessed on October 31, 2023. http://oasis.caiso.com/mrioasis/default.do?tiny=SIddoA
- 78. California State Water Resources Control Board, Confined Animal Facilities Dairy Program Regulations and Requirements. Available at https://www.waterboards.ca.gov/centralvalley/water_issues/confined_animal_facilities/pr ogram regs requirements/dairy/
- 79. CFR section 98.464 Monitoring and QA/QC requirements. July 12, 2010. Available at https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-98/subpart-TT
- 80. Clark, C., Han, J., Burnham, A., Dunn, J.B., & Wang, M.Q., *Life-Cycle analysis of Shale Gas and Natural Gas*. Energy Systems Division, Argonne National Laboratory. December 2011. Accessed October 15, 2023. *https://greet.es.anl.gov/publication-shale_gas*
- 81. Cole, John, *The Effects of Breeding and Selection On Lactation In Dairy Cattle,* Anim Front. 2023 Jun; 13(3): 62–70. Published online 2023 Jun 14. Available at: *https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10266753/*

- 82. Elgowainy, A., Han, J., Cai, H., Wang, M., Forman, G.S., & Divita, V.B., Energy Efficiency and Greenhouse Gas Emission Intensity of Petroleum Products at U.S. Refineries. Environmental Science & Technology, 48(13), 7612-7624. May 28, 2014 (accessed October 15, 2023). https://pubs.acs.org/doi/full/10.1021/es5010347 https://greet.es.anl.gov/publication-energy-efficiency-refineries
- 83.FAO. 2023. Dairy Market Review Emerging trends and outlook in 2023. Rome. Available at: https://www.fao.org/3/cc9105en/cc9105en.pdf
- 84. Fulton, Lewis, Alan Jenn, Christopher Yang, et al. *California Hydrogen Analysis Project: The Future Role of Hydrogen in a Carbon-Neutral California: Final Synthesis Modeling Report.* UC Davis. April 19, 2023. Available at *https://escholarship.org/uc/item/27m7g841*
- 85. Gee, Quentin, and Aria Berliner and Alexander Wong. 2024. 2024 Transportation Fuels Assessment. California Energy Commission. Publication Number: CEC-200-2024-003-D
- 86. Hamilton, Booz Allen, et al. *Alternative Jet Fuels Emissions Quantification Methods Creation and Validation Report*. August 2019.
- 87.ICF. Documentation for Greenhouse Gas Emission and Energy Factors Used in the Waste Reduction Model (WARM) Management Practices Chapters. November 2020. Available at https://www.epa.gov/sites/default/files/2020-12/documents/warm management practices v15 10-29-2020.pdf
- 88. MacDonald, James M., Scale Economies Provide Advantages to Large Dairy Farms. August 3, 2020. https://www.ers.usda.gov/amber-waves/2020/august/scale-economiesprovide-advantages-to-large-dairy-farms/
- 89. MacDonald, James M., Jonathan Law, and Roberto Mosheim. July 2020. Consolidation in U.S. Dairy Farming, ERR-274. Available at: https://www.ers.usda.gov/webdocs/publications/98901/err-274.pdf
- 90. Njuki, Eric. February 2022. Sources, Trends, and Drivers of U.S. Dairy Productivity and Efficiency, ERR-305, U.S. Department of Agriculture, Economic Research Service. https://www.ers.usda.gov/publications/pub-details/?pubid=103300
- 91. Njuki, Eric, U.S. Dairy Productivity Increased Faster in Large Farms and Across Southwestern States. March 22, 2022. *https://www.ers.usda.gov/amberwaves/2022/march/u-s-dairy-productivity-increased-faster-in-large-farms-and-acrosssouthwestern-states/*
- 92. OECD/FAO (2020), OECD-FAO Agricultural Outlook 2020-2029, OECD Publishing, Paris/FAO, Rome, https://doi.org/10.1787/1112c23b-en
- 93. Pfankuch, Bart. South Dakota is emerging as a major player in the diary industry. Here's why. March 4, 2021. Accessed August 2, 2024. https://www.argusleader.com/story/news/2021/03/04/south-dakota-emerging-majorplayer-dairy-industry-heres-why/4577419001/
- 94. San Joaquin Valley Air Pollution Control District, Dairy Permitting. Available at https://ww2.valleyair.org/permitting/dairy-permitting/
- 95. Standardized Regulatory Impact Assessment for Major Regulations, CCR, Title 1, Division 3, Chapter 1, sections 2000-2004.
- 96. State government: financial and administrative accountability, Senate Bill No. 617, Chapter 496. October 2011.
- 97. United States Energy Information Administration, *Form EIA-923 detailed data with previous form data*. Accessed on October 15, 2023. https://www.eia.gov/electricity/data/eia923/
- 98. United States Energy Information Administration, *Number of plants for other, United States, all sectors*. Accessed on October 27, 2023.

https://www.eia.gov/electricity/data/browser/#/topic/1?agg=2,0,1&fuel=00g&geo=g&sec =g&freq=A&datecode=2014&rtype=s&pin=&rse=0&maptype=0<ype=pin&ctype=linech art&end=2016&start=2014

- 99. United States Energy Information Administration, *Petroleum & Other Liquids, Supply and Disposition, West Coast (PADD 5), Annual 2014.* Accessed on February 7, 2018.
- 100. United States Environmental Protection Agency, *eGRID Power Profiler tool.* Updated on June 5, 2023. *https://www.epa.gov/egrid/power-profiler#/*
- 101. USDA. U.S. Renewable Diesel Production Growth Drastically Impacts Global Feedstock Trade. June 11, 2024. Available at https://fas.usda.gov/data/us-renewablediesel-production-growth-drastically-impacts-global-feedstock-trade
- 102. USDA and NASS, Census of Agriculture Reports from 1997-2022. Available at *https://www.nass.usda.gov/AgCensus/*
- 103. Visual Capitalist. *Mapped: Energy Cost by State in 2024*. July 10, 2024. Available at *https://www.visualcapitalist.com/mapped-energy-costs-by-state-in-2024/*

These documents are available for inspection at the California Air Resources Board, 1001 I Street, Sacramento, California, 95814, between the hours of 9:00am to 4:00pm, Monday through Friday (excluding holidays). To inspect these documents please contact Chris Hopkins, Regulations Coordinator, at (279) 208-7347.

Agency Contacts

Inquiries concerning the substance of the proposed regulation may be directed to Dillon Miner, Staff Air Pollution Specialist, Alternative Fuels Section, at (279) 208-7437 or (designated back-up contact) Jordan Ramalingam, Manager, Alternative Fuels Section, at (916) 277-0499.

Public Comments

Written comments will only be accepted on the modifications identified in this Notice. Comments may be submitted by postal mail or by electronic submittal no later than the due date to the following:

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

Electronic submittal: https://ww2.arb.ca.gov/lispub/comm/bclist.php

Please note that under the California Public Records Act (Gov. Code § 6250 et seq.), your written and verbal comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request.

In order to be considered by the Executive Officer, comments must be directed to CARB in one of the two forms described above and received by CARB no later than the deadline date for public comment listed at the beginning of this notice. Only comments relating to the above-described modifications to the text of the regulations shall be considered by the Executive Officer.

If you need this document in an alternate format or another language, please contact the Clerks' Office at (916) 322-5594 or by facsimile at (916) 322-3928 no later than five (5)

business days from the release date of this notice. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

Si necesita este documento en un formato alterno u otro idioma, por favor llame a la oficina del Secretario del Consejo de Recursos Atmosféricos al (916) 322-5594 o envíe un fax al (916) 322-3928 no menos de cinco (5) días laborales a partir de la fecha del lanzamiento de este aviso. Para el Servicio Telefónico de California para Personas con Problemas Auditivos, ó de teléfonos TDD pueden marcar al 711.

California Air Resources Board

Steven S. Cliff, Ph.D **Executive Officer**

Date: August 12, 2024

Attachment

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see CARB's website (ww2.arb.ca.gov).