Title 17. California Air Resources Board

Notice of Public Hearing to Consider Proposed Low Carbon Fuel Standard Amendments

The California Air Resources Board (CARB or Board) will conduct a public hearing at the date and time noted below to consider approving for adoption the proposed Low Carbon Fuel Standard amendments.

Date: March 21, 2024

Time: 9:00 A.M.

In-Person Location:

California Air Resources Board
Byron Sher Auditorium
1001 I Street, Sacramento, California 95814

Remote Option:

Zoom

This public meeting may continue at 9:00 a.m., on March 22, 2024. Please consult the public agenda, which will be posted ten days before the March 21, 2024, Board Meeting, for important details, including the day on which this item will be considered and how the public can participate via Zoom if they choose to be remote.

Written Comment Period and Submittal of Comments

In accordance with the Administrative Procedure Act, interested members of the public may present comments orally or in writing during the hearing and may provide comments by postal mail or by electronic submittal before the hearing. The public comment period for this regulatory action will begin on January 5, 2024. Written comments not submitted during the hearing must be submitted on or after January 5, 2024, and received **no later than February 20, 2024**. Comments submitted outside that comment period are considered untimely. CARB may, but is not required to, respond to untimely comments, including those raising significant environmental issues. The Board also encourages members of the public to bring to the attention of staff in advance of the hearing any suggestions for modification of the proposed regulatory action. Comments submitted in advance of the hearing must be addressed to one of 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 (Government Code section 7920.000 et seq.), your written and oral 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.

Additionally, the Board requests but does not require that persons who submit written comments to the Board reference the title of the proposal in their comments to facilitate review.

Authority and Reference

This regulatory action is proposed under the authority granted in California Health and Safety Code, sections 38510, 38530, 38560, 38560.5, 38562.2, 38571, 38580, 39600, 39601, 41510, 41511, and 43018; 42 U.S.C. section 7545; and Western Oil and Gas Ass'n v. Orange County Air Pollution Control District, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975). This action is proposed to implement, interpret, and make specific sections 38501, 38510, 39515, 39516, 38571, 38580, 39000, 39001, 39002, 39003, 39515, 39516, 41510, 41511 and 43000 of the California Health and Safety Code; section 25000.5 of the Public Resources Code; and Western Oil and Gas Ass'n v. Orange County Air Pollution Control District, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975).

Informative Digest of Proposed Action and Policy Statement Overview (Gov. Code, § 11346.5, subd. (a)(3))

Sections Affected:

Proposed amendments to California Code of Regulations, title 17, division 3, chapter 1, subchapter 10, article 4, subarticle 7, sections 95481, 95482, 95483, 95483.2, 95483.3, 95484, 95485, 95486, 95487, 95486.1, 95486.2 95488, 95488.1, 95488.2, 95488.3, 95488.5, 95488.6, 95488.7, 95488.8, 95488.9, 95488.10, 95489, 95490, 95491, 95491.1, 95495, 95500, 95501, 95502, and 95503. Proposed adoption of California Code of Regulations, title 17, division 3, chapter 1, subchapter 10, article 4, subarticle 7, sections 95486.3 and 95491.2.

Documents Incorporated by Reference (Cal. Code Regs., tit. 1, § 20, subd. (c)(3)):

- Agro-Ecological Zone Emissions Factor (AEZ-EF) model, December 31, 2014, section 95481(a)
- Energy and Environmental Economics, Inc. Avoided Cost Calculator, May 2018, section 95481(a)
- Global Trade Analysis Project (GTAP) Model, December 2014, 95481(a)
- Hydrogen Station Capacity Evaluator (HySCapE), August 13, 2018, section 95481(a)N
- Oil Production Greenhouse gas Emissions Estimator Version 3.0b, May 14, 2022, section 95481(a)
- Lookup Table Pathways Technical Support Documentation, [Date of adoption], section 95488.1(b)
- California-modified Greenhouse Gases, Regulated Emissions, and Energy use in Transportation version 4.0 (CA-GREET4.0) model, [Date of adoption], 95488.3(b)
- Tier 1 CI Calculator for Corn or Sorghum Ethanol, [Date of adoption], section 95488.3(b)(1)
- Tier 1 CI Calculator for Sugarcane Ethanol, [Date of adoption], section 95488.3(b)(2)
- Tier 1 CI Calculator for Biodiesel, [Date of adoption], section 95488.3(b)(3)

- Tier 1 CI Calculator for Hydroprocessed Ester and Fatty Acid (HEFA) Fuels, [Date of adoption], section 95488.3(b)(4)
- Tier 1 CI Calculator for Landfill Biomethane, [Date of adoption], section 95488.3(b)(5)
- Tier 1 CI Calculator for Wastewater Sludge Biomethane, [Date of adoption], section 95488.3(b)(6)
- Tier 1 CI Calculator for Dairy and Swine Manure Biomethane, [Date of adoption], section 95488.3(b)(7)
- Tier 1 CI Calculator for Organic Waste Biomethane, [Date of adoption], section 95488.3(b)(8)
- Tier 1 CI Calculator for Hydrogen, [Date of adoption], section 95488.3(b)(9)
- Tier 1 CI Calculator for Corn or Sorghum Ethanol - Instruction Manual, [Date of adoption], section 95488.6(a)(1)(B)(1)
- Tier 1 CI Calculator for Sugarcane Ethanol - Instruction Manual, [Date of adoption], section 95488.6(a)(1)(B)(2)
- Tier 1 CI Calculator for Biodiesel - Instruction Manual, [Date of adoption], section 95488.6(a)(1)(B)(3)
- Tier 1 CI Calculator for Hydroprocessed Ester and Fatty Acid Fuels - Instruction Manual, [Date of adoption], section 95488.6(a)(1)(B)(4)
- Tier 1 CI Calculator for Landfill Biomethane - Instruction Manual, [Date of adoption], section 95488.6(a)(1)(B)(5)
- Tier 1 CI Calculator for Wastewater Sludge Biomethane - Instruction Manual, [Date of adoption], section 95488.6(a)(1)(B)(6)
- Tier 1 CI Calculator for Dairy and Swine Manure Biomethane - Instruction Manual, [Date of adoption], section 95488.6(a)(1)(B)(7)
- Tier 1 CI Calculator for Organic Waste Biomethane - Instruction Manual, [Date of adoption], section 95488.6(a)(1)(B)(8)
- Tier 1 CI Calculator for Hydrogen - Instruction Manual, [Date of adoption], section 95488.6(a)(1)(B)(9)
- Carbon Capture and Sequestration Protocol under the Low Carbon Fuel Standard, August 13, 2018, section 95490(a)
- ASTM D1250-08 (2013) e1, Standard Guide for Use of the Petroleum Measurement Tables, ASTM D1250-08, reapproved 2013, sections 95491(d)(1)(B)2.b.
- American Petroleum Institute (API) Manual of Petroleum Measurement Standards Chapter 11 – Physical Properties Data, May 2004, section 95491(d)(1)(B)3.
- API Technical Data Book – Petroleum Refining Chapter 6 – Density (Sixth Edition, April 1997), section 95491(d)(1)(B)3.
- SB 350 Low-Income Barriers Study, February 2018, section 95491(e)(5)(A)2.

The above listed documents with bracketed dates of adoption are also proposed to be adopted by this regulation and thus the adoption date would be the date that the regulation is adopted by CARB.

Background and Effect of the Proposed Regulatory Action:

California is in the midst of a rapid transition to cleaner fuels and carbon neutrality, with just over 20 years to transition from today's significant fossil fuel usage to a future of clean fuels and technology. In 2022, CARB approved the 2022 Scoping Plan for Achieving Carbon

Neutrality (2022 Scoping Plan Update), which charted a path to achieving carbon neutrality by 2045 and reducing greenhouse gas emissions 85% below 1990 levels by 2045. Meeting this goal will require the deployment of greenhouse gas emission reduction strategies at an unprecedented scale and pace. As transportation emissions, primarily from the use of fossil fuels, are California's single biggest source of greenhouse gas emissions and contributor to poor air quality, the State is working to rapidly increase the numbers of zero-emission vehicles on the road and deploy cleaner fuels to power them.

The Low Carbon Fuel Standard (LCFS) is a key part of California's transportation decarbonization strategy and a successful one thus far. The LCFS provides the economic incentives to produce cleaner fuels like electricity, hydrogen and biofuels that are needed to displace fossil fuels and reduce transportation sector emissions. The LCFS has supported the displacement of billions of gallons of petroleum fuels with lower carbon alternatives, and without these alternative fuels the State risks returning to higher levels of fossil fuel use and fewer climate and air quality benefits. With clear scientific consensus on the need to rapidly decarbonize and achieve carbon neutrality by mid-century, the significant health and economic benefits of phasing down fossil fuel use, and the introduction of federal funding for alternative fuels and clean energy, staff is proposing updates to the LCFS regulation.

CARB may also consider other changes to the sections affected, as listed on page 2 of this notice, or other sections within the scope of this notice, during the course of this rulemaking process.

Objectives and Benefits of the Proposed Regulatory Action:

The proposed amendments to the LCFS Regulation are focused on the following key concepts:

- Increasing the stringency of the program to more aggressively decarbonize fuels and thereby reduce our dependence on fossil fuels;
- Strengthening the program's equity provisions to promote investment in disadvantaged, low-income and rural communities;
- Supporting electric and hydrogen truck refueling;
- Incentivizing more production of clean fuels needed in the future, such as low-carbon hydrogen;
- Supporting methane emissions reductions and deploying biomethane for best uses across transportation; and
- Strengthening guardrails on crop-based fuels to prevent deforestation or other potential adverse impacts.

These proposed changes, if adopted, would result in significant greenhouse gas (GHG) reductions as well as air quality, health, and economic benefits across the State. These benefits include:

GHG Reductions

- 90% reduction in carbon intensity of California's transportation fuels by 2045.
- 558 million metric tons of life cycle CO_2e reductions from the amendments.

Health Benefits

- Almost $5 billion in total avoided health costs resulting from nearly 4,300 tons of particulate matter (PM) 2.5 reduction and more than 25,000 tons of oxides of nitrogen (NOx) reductions.

Economic Benefits

- $128 billion in revenue estimated accruing to California businesses from credit generation/sales.
- Job growth in the electricity and biofuel sectors as demand for these fuels grows.
- Increases the diversity and competitiveness of transportation fueling options for California consumers, transitioning supply from just ten fossil fuel refiners to hundreds of individual biofuel, electricity, and hydrogen producers.

The changes will also help support implementation of California's world-leading zero-emission vehicle policies, align with the 2022 Scoping Plan Update, and will provide a model for other jurisdictions looking to deploy clean fuel and climate policies. And finally, as Californians transition away from fossil fuels and into more zero-emission vehicles (ZEVs) and lower-carbon fuel alternatives, the fuel costs Californians pay to travel will also decrease, providing Californians billions of dollars in savings. CARB staff estimates the amount of money Californians spend on fueling costs across all vehicle classes could be up to 42% lower in 2045 than compared to fuel costs in 2021. This translates into an annual savings of over $20 billion in fuel expenditures in 2045 alone.

Summary of Proposed Amendments

The proposed amendments would increase both the pre- and post-2030 stringency of the LCFS carbon intensity (CI) benchmarks. The proposed amendments would require a 30% reduction in fuel CI by 2030 and a 90% reduction in fuel CI by 2045 from a 2010 baseline. To accommodate rapid advances in transportation fuel production and use, the proposed amendments also includes a near-term step-down and an Automatic Acceleration Mechanism (AAM). The step-down is a one-time 5% reduction in the CI benchmark in 2025 that increases the stringency of the CI target. The AAM is another tool to increase the stringency of the CI benchmark, but is activated only when specific regulatory conditions are met. The objective is to send clear, long-term market signals to support investment in low-carbon fuel production and technologies that are needed to achieve deep emissions reductions in the transportation sector while supporting the broader portfolio of zero-emission vehicle regulations and climate statutes. Another goal is to align the crediting opportunities in the LCFS with the fuel and technology pathways identified in the 2022 Scoping Plan Update. To encourage additional GHG reductions in key areas where decarbonization will be important to meet long-term climate goals, staff proposes to eliminate the current exemption for intrastate fossil jet fuel starting in 2028 and expand ZEV infrastructure crediting to the medium- and heavy-duty vehicle sector under the program. Given the need to quickly scale low-carbon fuel production in this decade and staff's experience implementing the program for over a decade, staff also proposes to update and streamline several quantification methods and analysis tools so that the program does not unnecessarily slow down the investment or availability of low-carbon fuels and so other jurisdictions can establish similar programs without significant administrative needs. See Table 2 in the Initial Statement of Reasons (ISOR) for a summary of proposed regulatory amendments to the LCFS regulation.

Comparable Federal Regulations:

The federal Renewable Fuel Standard (RFS) regulations, 40 CFR § 80.1400 et seq., require that nearly 21 billion gallons of biofuels be sold annually nationwide in 2023. But the RFS statutory volumetric mandates alone will not achieve the 30% reduction in CI by 2030 and the other objectives of the proposed LCFS regulation amendments. Further, the RFS targets only biofuels and not other alternative fuels incentivized by the LCFS (e.g., electricity and hydrogen). Therefore, while the RFS and the LCFS complement each other in promoting low-CI biofuels, the RFS does not spur the development of all the low-CI fuels that are included in the LCFS.

An Evaluation of Inconsistency or Incompatibility with Existing State Regulations (Gov. Code, § 11346.5, subd. (a)(3)(D)):

During the process of developing the proposed regulatory action, CARB conducted a search of any similar regulations on this topic and concluded these regulations are neither inconsistent nor incompatible with existing state regulations.

Disclosure Regarding the Proposed Regulation

Fiscal Impact/Local Mandate Determination Regarding the Proposed Action (Gov. Code, § 11346.5, subds. (a)(5)&(6)):

The determinations of the Board's Executive Officer concerning the costs or savings incurred by public agencies and private persons and businesses in reasonable compliance with the proposed regulatory action are presented below.

Under Government Code sections 11346.5, subdivision (a)(5) and 11346.5, subdivision (a)(6), the Executive Officer has determined that the proposed regulatory action would create costs or savings to any State agency, would not create costs or savings in federal funding to the State, and would create costs or mandate to any local agency or school district, whether or not reimbursable by the State under Government Code, title 2, division 4, part 7 (commencing with section 17500), or other nondiscretionary cost or savings to State or local agencies.

Cost to any Local Agency or School District Requiring Reimbursement under Gov. Code section 17500 et seq.:

Pursuant to Government Code sections 11346.5, subdivision (a)(5) and 11346.5, this regulatory action will result in a mandate that would create costs and cost-savings to local agencies and school districts. However, these costs are not reimbursable pursuant to Section 6 of Article XIII B of the California Constitution and Part 7 (commencing with Section 17500) of Division 4 of the Government Code. These costs are not reimbursable because the proposed amendments neither compel local agencies to provide new governmental functions (i.e., do not require such agencies to provide additional services to the public), nor do they impose requirements that apply only to local agencies or school districts.[1] Fuel purchase costs and savings apply to all individuals and entities that own or operate vehicles. This proposed regulatory action also does not compel local agencies to increase the

[1] County of Los Angeles v. State of California (1987) 43 Cal.3d 46, 56.

actual level or quality of services that they already provide the public.[2] For the foregoing reasons, any costs incurred by local agencies to comply with this regulatory action are not reimbursable.

Cost or Savings for State Agencies:

Three separate impacts related to the proposed amendments affect State government finances: revenue generated from the sale of credits from state fleets that use low-CI fuels, change in state tax revenues due to the change in the fuel mix, and the change in the expenditure on fuels for government fleets.

The proposed Amendments are anticipated to have no current fiscal year, 2023-2024, impacts. Over the lifetime of the proposed amendments there would be $17.5 million increase in fuel costs, $379 million increase in revenue, and no decrease in revenue. Fiscal impacts, costs, revenue increases, and savings, are anticipated to begin occurring subsequent to the effective date of the proposed amendments.

Other Non-Discretionary Costs or Savings on Local Agencies:

Three separate impacts related to the proposed amendments affect local government finances: revenue generated from the sale of credits from transit fleets that use low-CI fuels, change in local tax revenues due to the change in the fuel mix, and the change in the expenditure on fuels for government fleets.

The proposed amendments are anticipated to have no current fiscal year, 2023-2024, impacts. Over the lifetime of the proposed amendments there would be $1.7 billion increase in LCFS credit revenue, $29.2 million decrease in tax revenue, and $52.5 million increase in fuel costs. Fiscal impacts, costs, revenue increases, and savings, are anticipated to begin occurring subsequent to the effective date of the proposed amendments.

Cost or Savings in Federal Funding to the State:

The proposed regulation is not expected to impose any costs or savings in federal funding to the State.

Housing Costs (Gov. Code, § 11346.5, subd. (a)(12)):

The Executive Officer has also made the initial determination that the proposed regulatory action will not have a significant effect on housing costs.

Significant Statewide Adverse Economic Impact Directly Affecting Business, Including Ability to Compete (Gov. Code, §§ 11346.3, subd. (a), 11346.5, subd. (a)(7), 11346.5, subd. (a)(8)):

The Executive Officer has made an initial determination that the proposed regulatory action would not have a significant statewide adverse economic impact directly affecting businesses, including the ability of California businesses to compete with businesses in other states, or on representative private persons.

[2] San Diego Unified School Dist. v. Commission on State Mandates (2004) 33 Cal.4th 859, 877.

Results of The Economic Impact Analysis/Assessment (Gov. Code, § 11346.5, subd. (a)(10)):

Major Regulation: Statement of the Results of the Standardized Regulatory Impact Analysis (SRIA) (Gov. Code, § 11346.3, subd. (c)): (if applicable)

Under Government Code section 11346.3, subdivision(c)(1), each state agency proposing to adopt, amend, or repeal a major regulation on or after November 1, 2013, must prepare a standardized regulatory impact assessment (SRIA) in the manner prescribed by the Department of Finance under to Government Code section 11346.36. The standardized regulatory impact analysis must address **all** of the following:

(A) The creation or elimination of jobs within the state.

The statewide employment impacts of the proposed amendments are estimated to have a positive impact on employment through 2027, followed by a mostly negative impact on employment through 2046. The positive impacts on employment primarily result from the credits generated by low-CI fuels. The demand for these credits leads to expansion in the industries producing these fuels. Increases in production costs and reductions in credit revenue in the long-term for low-CI fuel producers negatively affect employment projections. Overall, the changes in employment do not exceed 0.05% of baseline California employment in any one year during the regulatory horizon.

The services and manufacturing sectors are projected to have initial increases in employment as resources are invested in development of low-CI fuel technologies, and then experience a decrease in employment over the baseline after the first five years. Losses in jobs are largest in the petroleum and coal products manufacturing industry and are caused by reduced demand for these high-CI fuels as demand increases for low-CI fuels, and by increased production costs from the deficits generated by fossil gasoline and diesel fuels, with an average annual loss of 1,168 jobs when compared to the baseline. Basic chemical manufacturing employment increases by an average of 429 jobs annually, driven by credits generated by hydrogen, renewable diesel, ethanol, and alternative jet fuels and additional demand for these fuels. The electrical power generation, transmission, and distribution industry is expected to increase jobs by 741 positions annually associated with credit generation from electricity projects. Overall, between 2026 and 2046, California employment grows by 2.2 million jobs, increasing from 25.9 million jobs in 2026 to 28.1 million jobs in 2046. On average, across all industries the estimated job impacts are approximately 4,085 fewer jobs created when compared to the baseline, with over a quarter of those job losses coming from the petroleum sector.

The creation of new businesses or the elimination of existing businesses within the state.

The Statewide jobs and output impacts of the proposed amendments are small relative to the total California economy suggesting the proposed amendments will have a minimal impact on overall business expansion or contraction. The proposed amendments are not expected to directly result in business creation or elimination; specifically, the proposed amendments do not require any new businesses to be created nor do they require closure of any existing businesses. The largest employment increase is estimated to be 0.02% for 2025 compared to

the baseline. The largest employment decrease is estimated to be 0.05% for 2044 through 2046 compared to the baseline. Output is expected to decrease for the lifetime of the regulation compared to the baseline. The largest output decrease in the State is estimated to be 0.16% for 2040 through 2045.

Moreover, LCFS incentives may encourage California firms, as well as other firms doing business in California, to invest early in innovative, low-CI fuel technologies and develop mature businesses earlier than firms not participating in the California market. Early investment may result in competitive advantages to these businesses as other state, federal, or international jurisdictions adopt similar carbon intensity standards.[3]

The competitive advantages or disadvantages for businesses currently doing business within the state.

The proposed amendments will increase the demand for low-carbon fuels, which provides an opportunity for businesses, both in-state and out-of-state, to increase revenue from the sale of low-carbon fuels in California. The sale of LCFS credits provides an additional revenue stream for these firms, enabling them to increase their market share and increase their competitiveness against high-CI fuels such as fossil gasoline or diesel.[4]

The increase or decrease of investment in the state.

Private domestic investment consists of purchases of residential and nonresidential structures and of equipment and software by private businesses and nonprofit institutions. It is used as a proxy for impacts on investments in California because it provides an indicator of the future productive capacity of the economy.

The proposed amendments require implementing processes that substitute low-carbon sources of energy, such as waste oils and renewable electricity, in place of fossil fuel sources. The proposed amendments, and the LCFS more broadly, are structured to encourage ongoing innovation and improvement in reducing the carbon intensity of transportation fuels as well as investment in innovative direct air capture and carbon capture, utilization, and sequestration approaches. Over the past decade, the LCFS has resulted in approximately 650 Tier 2 fuel pathway certifications under the current CA-GREET3.0 model, which includes more complex and innovative production methods than are represented by more conventional pathways. The proposed amendments are expected to continue to incentivize investment in low-carbon fuel production. The proposed amendments will also lead to an overall higher price for LCFS credits relative to the baseline, which will send a signal for research, development, and deployment of innovative technologies and fuels that support California's long-term GHG emissions reduction goals while simultaneously improving air quality in frontline communities.

The economic modeling utilized for the economic analysis is not structured to capture these types of innovation in the transportation fuel market and focuses on the direct impacts of the proposed amendments. Given the limitations of the model and the fact that some of the benefits of the proposed amendments likely have an unquantifiable impact on innovation in the transportation fuels sector, as modeled, the proposed amendments result in slight annual

[3] Currently Oregon, Washington, British Columbia, Canada, Brazil, and the European Union have LCFS-like policies in place.

[4] The LCFS incentive is incremental to incentives created by federal biofuel/low-carbon fuel policy, including the RFS.

private investment decreases of $11 million on average. The difference in private investment for the proposed amendments is modest and does not exceed 0.10% of baseline investment across the analytical time period for any one year and averages no percentage change over the regulatory horizon.

The incentives for innovation in products, materials, or processes.

As mentioned above, the proposed amendments will incentivize research, development, and deployment of innovative technologies and fuels that support California's long-term GHG emissions reduction goals and displace fossil fuels. All fuel producers will have an increased incentive to innovate and deploy new methods that reduce the CI of their fuels. The proposed amendments will additionally provide long term price stability for LCFS credits, which is essential for low-CI fuel producers to make investments in long-term capital projects and research and development.

The benefits of the regulations, including, but not limited to, benefits to the health, safety, and welfare of California residents, worker safety, and the state's environment and quality of life, among any other benefits identified by the agency.

The proposed amendments are designed to reduce toxic air contaminant, criteria pollutant, and GHG emissions by decreasing the carbon intensity of California's transportation fuel pool and reducing dependence on petroleum fuel. As there is no Social Cost of CO_2e, there is not a straightforward metric to estimate the benefits of the proposed amendments. If all GHG reductions under the proposed amendments are assumed to be carbon dioxide reductions, the cumulative estimated benefits from the proposed amendments would range from approximately $14 billion to $61 billion (in 2021$). Cumulatively, from 2024 to 2046, the proposed amendments are expected to reduce statewide transportation emissions by approximately 4,281 tons of PM2.5 and 25,586 tons of NOx relative to the baseline. The total statewide valuation of avoided health outcomes from 2024 to 2046 is approximately $5 billion. These reductions in toxic air contaminants and criteria pollutant emissions may improve safety for workers, particularly at freight hubs, where substitution of renewable diesel and other low-carbon fuels for fossil diesel will reduce exposure to harmful air pollution.

The proposed regulations provide credit generating revenue to California businesses of $128.4 billion over the lifetime of the regulation. The total monetized benefit from credit revenue and avoided health outcomes of the proposed amendment is $133.4 billion.

Additionally, as Californians transition away from fossil fuels and into more ZEVs and lower-carbon fuel alternatives, CARB staff estimates that the fuel costs Californians pay to travel will also decrease, resulting in billions of dollars in savings on fuel costs each year. The regulations CARB has adopted (e.g., ACC II, ACF/ACT) in combination with the LCFS will help to increase the deployment of vehicles with lower emissions (e.g., BEVs/FCEVS) and reduce the costs of the alternative fuels into the future.

Department of Finance Comments and Responses on the Standardized Regulatory Impact Assessment (SRIA).

1. **DOF Comment: The SRIA assumes that the current blend of gasoline which is 90 percent regular gasoline (which generates deficits) and 10 percent ethanol (which generates credits) will persist through 2046. The SRIA should justify why this is a**

reasonable assumption and provide historical data or other evidence for why it does not expect this mix to change.

Response: Since the phase-out of methyl tert-butyl ether (MTBE), ethanol has been the primary gasoline oxygenate. While California gasoline does not require the use of ethanol at 10% blend levels, California does have gasoline regulations (separate from the LCFS) that limit the ethanol content of fuel to 10% by volume (E10). Because CARB is required to reflect the current regulatory environment in the SRIA, CARB's SRIA analysis assumed ethanol would be blended at up to 10% by volume in all scenarios (Baseline, Proposed, and Alternatives).

Given the existence of California's E10 limit, the federal Renewable Fuel Standard (RFS) (which has created volumetric requirements and incentives[5] for the use of renewable fuel at a national level), as well as the compatibility of existing fuel infrastructure and vehicle compatibility requirements, CARB staff believes that it is reasonable to assume that E10 will continue to be used in California through 2046. CARB's assumption to use 10% ethanol use is also consistent with the current average national blend being about 10% ethanol by volume.[6]

Under California law, a regulatory change to update California's Reformulated Gasoline Regulation to allow the ethanol limit to be raised in California to E15 would require a Multimedia Evaluation (MME) and approval by the Environmental Policy Council (EPC).[7] The MME process is conducted by the Multimedia Working Group (MMWG), which consists of staff from various state agencies with regulatory oversight over fuels. The MME process takes years to complete. If CARB releases proposed amendments, the MMWG will make recommendations to the EPC whether allowing E15 use in California would have significant adverse impacts on public health or the environment. If the EPC determines there will not be significant impacts, CARB may then consider adoption of regulatory amendments allowing E15 use in California. At this time, CARB has not proposed to update the California Reformulated Gasoline Regulations to allow for E15 use, the MME process has not been finalized, and whether or not E15 use would pose significant adverse impacts to public health or the environment has not been established by the EPC.

Even if E15 is approved in California, there are still several market barriers that would limit its adoption and availability in the state including vehicle compatibility, fuel infrastructure readiness, and consumer acceptance. On the vehicle side, according to the U.S. Environmental Protection Agency (EPA), only vehicles model year 2001 and newer are approved for using E15.[8] However, some automakers have warned that using E15 may void vehicle warranties or cause damage to engines and fuel systems.[9] Therefore, some

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[5] The RFS currently incentivizes up to 15 billion gallons of corn ethanol to be used annually in the United States to meet federal requirements. United States Environmental Protection Agency, *Renewable Fuel Annual Standards*. (Updated on June 21, 2023). https://www.epa.gov/renewable-fuel-standard-program/renewable-fuel-annual-standards

[6] United States Energy Information Administration, *Frequently Asked Questions*. (Accessed on October 10, 2023). https://www.eia.gov/tools/faqs/faq.php?id=27&t=10

[7] Health & Saf. Code, § 43830.8. See also California Air Resources Board, *Fuels Multimedia Evaluation of E15*. (Accessed on October 10, 2023). https://ww2.arb.ca.gov/resources/documents/fuels-multimedia-evaluation-e15

[8] United States Environmental Protection Agency, *E15 Fuel Registration*. (Accessed on October 10, 2023). https://www.epa.gov/fuels-registration-reporting-and-compliance-help/e15-fuel-registration

[9] United States Department of Agriculture, *Assessing Future Market Opportunities and Challenges for E15 and Higher Ethanol Blends*. May 2022. *https://www.usda.gov/sites/default/files/documents/e15-market-opportunities.pdf*

consumers may be reluctant or unable to use E15 in their vehicles, especially older models. On the fuel infrastructure side, the existing fuel infrastructure in California is not universally compatible with E15, as some tanks, pipes, pumps, and dispensers may need to be upgraded or replaced to handle higher ethanol blends. This would entail additional costs and time for fuel retailers, who may not have enough incentives or resources to make the necessary changes and may require public funding to support. For example, expansion of E85 and E15 pumps and terminals in Iowa has made use of significant state and federal grants.[10] Similarly, expanded use of E85 in California has relied significantly on State and federal grants.[11] Moreover, some fuel retailers may face contractual or legal restrictions that prevent them from offering E15 at their stations.

Based on these reasons and at this time, CARB staff believe that as part of completing the required SRIA for the LCFS rulemaking, it is reasonable to assume that E10 will continue to be used in California through 2046. Different mixes may be allowed in the future, but the process to allow those is still underway with no certainty on outcomes.

2. **DOF Comment: The SRIA does not back up its assumption that electric cars and light-duty trucks (electric vehicles or EVs) would no longer have a substantial range or charging-time disadvantage compared to gasoline-powered vehicles by 2031. It should justify this assumption, as the EVs' annual mileage will affect total electricity demand over the regulation's effective period.**

Response: As part of completing the SRIA, CARB made a conservative assumption that light-duty electric vehicles would increase their range each year and that range increase would result in an average VMT increase by 2% per year from the initial mileage displacement, until achievable VMT matched conventional vehicles. The data used to inform the initial mileage displacement factor for electric vehicles (EV) came from a 2018 snapshot of California Department of Motor Vehicles (DMV) data. EV technology has substantially matured since that time, and new EV models being offered have significantly longer ranges and faster charging capabilities.[12,13,14] More recent DMV data snapshots suggest that EVs have significantly closed the gap with the conventional fleet for vehicle miles traveled (VMT), which is currently about 95% of the fleet average VMT for the past several years. However, effects from COVID and the resulting reduction in VMT and changes in transportation trends may not be representative of VMT trends in the next several years. Given this uncertainty, CARB staff decided to be conservative for initial years, and make use of the 2018 DMV snapshot referenced in the SRIA. Research from UC Davis in 2020 suggests that longer-range battery

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[10] Iowa Department of Agriculture & Land Stewardship, *Iowa Renewable Fuels Infrastructure Program*. (Accessed on October 10, 2023). https://iowaagriculture.gov/IRFIP

[11] United States Department of Agriculture, *USDA Rural Development Higher Blends Infrastructure Incentive Program*. June 26, 2023. https://www.rd.usda.gov/media/file/download/usda-rd-nr-hbiip-chart-06262023pdf

[12] IEA, *Evolution of average range of electric vehicles by powertrain, 2010-2021*. (Updated on May 19, 2022). https://www.iea.org/data-and-statistics/charts/evolution-of-average-range-of-electric-vehicles-by-powertrain-2010-2021

[13] Bloomberg New Energy Finance, *Electric Vehicle Outlook 2023*. 2023. https://assets.bbhub.io/professional/sites/24/2431510_BNEFElectricVehicleOutlook2023_ExecSummary.pdf

[14] Brown, A., Cappellucci, J., White, E., Heinrich, A., & Cost, E., *Electric Vehicle Charging Infrastructure Trends from the Alternative Fueling Station Locator: Fourth Quarter 2022*. National Renewable Energy Laboratory. May 2022. https://www.nrel.gov/docs/fy23osti/85801.pdf

electric vehicles have already closed the gap in terms of VMT.[15] Research by Doshi and Metcalf similarly suggests that longer-range EVs may not have a mileage discrepancy compared to conventional gasoline vehicles, such as the longer-range Tesla vehicles represented in the dataset they used.[16]

The Bloomberg New Energy Finance EV Outlook report[17]suggests that current average ranges for EV models are around 200 miles, with an average increase in range for EVs being sold going up by around 10 percent per year. If that range increase continues, the average EV could have a full-battery range of approximately 400 miles by 2030, a range that exceeds the Tesla vehicles that make up a significant portion of the long-range EV sample that Doshi and Metcalf suggest may not have a VMT penalty compared to conventional vehicles. Given these factors, CARB made a conservative assumption that light-duty electric vehicles would increase their average VMT by 2% per year due to range improvements, until achievable VMT matched conventional vehicles. Staff have not received comments suggesting changes to this assumption from industry nor the public during the public workshops CARB held on updates to the LCFS regulation.

3. **DOF Comment: The Advanced Clean Fleets regulation requires that EVs comprise 50 percent of government purchased fleets by 2024 and 100 percent of government vehicle purchases by 2027 will be EV. It is unclear whether the SRIA's estimated revenue from LCFS credit sales ($239 million from 2024 to 2045) accounts for EVs' increasing share of government fleets. The baseline for the SRIA's impact estimate should be based on state and local LCFS credit revenue under the existing clean fleets requirements, as otherwise the impact of the proposed regulation would be overstated.**

Response: Both the baseline and scenario transportation fuel demand pools assume full implementation of CARB's zero emission vehicle regulations, including Advanced Clean Fleets (ACF), Advanced Clean Cars II, and Innovative Clean Transit, among others. Staff then applied the ratios for the local and state government fuel expenditures as compared to the total California fuel expenditures to the total deficits and credits generated according to the California Transportation Supply model outputs for each scenario. As such, the government fleets are assumed to convert to zero-emission vehicles at the same rate as the total California fleet, and results are not overstated because this transition is reflected in the baseline and the proposed amendments do not claim credit for the transition to zero-emission fleets.

Staff used the following assumptions for this analysis:

The proportion of gasoline and its substitutes used among households, businesses, and government is based on their shares of light-duty vehicle ownership and rentals.[18] The

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[15] University of California, Davis, *Advanced Plug-in Electric Vehicle Travel and Charging Behavior Final Report*. April 10, 2020. https://csiflabs.cs.ucdavis.edu/~cjnitta/pubs/2020_03.pdf

[16] Doshi, S. S., & Metcalf, G. E., *How Much Are Electric Vehicles Driven? Depends on the EV*. MIT Center for Energy and Environmental Policy Research. January 2023. *https://ceepr.mit.edu/wp-content/uploads/2023/01/MIT-CEEPR-WP-2023-01.pdf*

[17] Bloomberg New Energy Finance, *Electric Vehicle Outlook 2023*. 2023. *https://assets.bbhub.io/professional/sites/24/2431510_BNEFElectricVehicleOutlook2023_ExecSummary.pdf*

[18] California Energy Commission, *Light Duty ZEV Uptake in Government and Rental Segments*. July 15, 2021. *https://www.energy.ca.gov/sites/default/files/2021-07/Light-Duty%20ZEV%20Uptake%20in%20Government%20and%20Rental%20Segments_ADA.pptx*

proportion of diesel and its substitutes used by household and business is estimated using fuel combustion volumes by sector from the 2022 edition of the CARB Greenhouse Gas Emission Inventory.[19] The State and local government split for both gasoline and diesel use was based on State government's share of government employment of 25% and local government's share of government employment of 75% for 2020.[20]

Additionally, to reflect the ACF's requirements for government fleets in both the baseline and scenarios, staff used 2021 DMV data to estimate the ratio of transit buses owned by local governments compared to the State. This ratio was then applied to the total electricity and hydrogen demand associated with urban buses obtained from EMFAC 2021 v.1.02 and used to calculate credits associated with use of zero-emission buses for both local government and State government. As compared to the REMI model's values for local and State government's share of California's fuel expenditures (0.75% and 0.25%, respectively), the transit bus calculation resulted in an average of 4% more credits going to local governments, and 1% fewer credits going to State government.

4. **DOF Comment: The SRIA should include the most recent Finance economic and population projections. We acknowledge that we previously indicated that the projections from the 2023-24 Governor's Budget were acceptable as the SRIA was expected to be submitted in May, but as updated projections have since been released, the latest population projections and inflation projections should be incorporated into the analysis.**

Response: After the completion of the analysis for the SRIA, the Department of Finance released a population projection interim series informed by available 2020 Census data dated July 19, 2023.[21] The interim projection released July 2023 has been incorporated into the macroeconomic results presented in the Initial Statement of Reasons.

5. **DOF Comment: All of the amounts in the SRIA's macroeconomic impact section are in 2021 dollars. These figures should be inflated to 2023 dollars using the latest monthly Consumer Price Index estimates.**

Response: The macroeconomic results presented in the SRIA were presented in a 2021-dollar value. Per the direction of Department of Finance in their SRIA Comment Letter, the Initial Statement of Reasons presents the results of the macroeconomic analysis in 2023-dollar values.

Business Report (Gov. Code, §§ 11346.5, subd. (a)(11); 11346.3, subd. (d)):

In accordance with Government Code sections 11346.5, subdivision (a)(11) and 11346.3, subdivision (d), the Executive Officer finds the reporting requirements of the proposed regulatory action which apply to businesses are necessary for the health, safety, and welfare of the people of the State of California.

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[19] California Air Resources Board, *2022 Edition of CARB's GHG Emission Inventory, fuel combustion activity data.*

[20] REMI Policy Insight Plus (v 3.0), State and Local government share of Employment.

[21] California Department of Finance, *Demographic Research Unit. Report P-3: Population Projections, California, 2020-2060* (Baseline 2019 Population Projections; Vintage 2023 Release). 2023. Zip File.

Cost Impacts on Representative Private Persons or Businesses (Gov. Code, § 11346.5, subd. (a)(9)):

In developing this proposed regulation, CARB staff evaluated the potential economic impacts on representative private persons or businesses. The proposed regulation would require a 30% reduction in fuel CI by 2030 and a 90% reduction in fuel CI by 2045 from a 2010 baseline. Providers of transportation fuels must cumulatively demonstrate that the mix of fuels they supply for use in California meets the LCFS carbon intensity standards, or benchmarks, for each annual compliance period. Regulated entities required to report fuels provided may demonstrate compliance through a system of credits and deficits. Credits are generated by supplying fuels with lower carbon intensity than the benchmark. Deficits result from supplying fuels with higher carbon intensity than the benchmark. A deficit generator meets its compliance obligation by retiring credits it earns or otherwise acquires from another party equal to the deficits it has incurred. Credits and deficits are generally determined based on the quantity of fuel sold, the carbon intensity of the fuel, and the efficiency by which a vehicle converts the fuel into useable energy.

The economic modeling staff conducted for the rulemaking indicates that the costs of complying with the proposed amendments would fall initially on crude oil refineries. The proposed amendments will also increase the demand for low-carbon fuels, which provides an opportunity for businesses, both in-state and out-of-state, to increase revenue from the sale of low-carbon fuels in California. This is discussed in more detail in the Chapter VIII of the ISOR.

Individuals or private persons may be indirectly affected through changing fuel costs, though staff estimates that the fuel costs Californians pay to travel will decrease due to the regulations CARB has adopted (e.g., ACC II, ACF/ACT) in combination with the LCFS. For more information, refer to Chapter VIII of the ISOR. Individuals are also expected to see health benefits due to lower carbon fuels which would provide local, regional, and statewide emissions benefits and associated cost savings.

Effect on Small Business (Cal. Code Regs., tit. 1, § 4, subds. (a) and (b)):

The Executive Officer has also determined under California Code of Regulations, title 1, section 4, that the proposed regulatory action would affect small businesses. The methodology and full details for estimating the cost impact to small businesses is provided in Chapter VIII of the ISOR.

Consideration of Alternatives (Gov. Code, § 11346.5, subd. (a)(13)):

Before taking final action on the proposed regulatory action, the Board must determine that no reasonable alternative considered by the Board, or that has otherwise been identified and brought to the attention of the Board, would be more effective in carrying out the purpose for which the action is proposed, would be as effective and less burdensome to affected private persons than the proposed action, or would be more cost-effective to affected private persons and equally effective in implementing the statutory policy or other provisions of law.

Staff considered two alternatives and two additional concepts to the proposed regulation. As explained in section IX of the ISOR, no alternative proposal was found to be less burdensome and equally effective in achieving the purposes of the proposed regulation in a manner that ensures full compliance with the authorizing law. Staff has not identified any reasonable alternatives that would lessen any adverse impact on small business.

Environmental Impact Analysis

CARB, as the lead agency for the proposed regulation, has prepared a draft environmental impact analysis (EIA) under its certified regulatory program (Cal. Code Regs., tit. 17, §§ 60000 through 60008) to comply with the requirements of the California Environmental Quality Act (CEQA) (Public Res. Code, § 21080.5). The EIA concluded implementation of the proposed regulation could result in: beneficial impacts to greenhouse gas; less than significant impacts, or no impacts, to energy, odors, mineral resources (short-term construction-related), population and housing, public services, recreation, and wildfire; and potentially significant [indirect/secondary] adverse impacts to aesthetics, agriculture and forestry resources, air quality, biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources (long-term operational-related), noise, transportation, tribal cultural resources, and utilities and service systems. The Draft EIA, included as Appendix D to the ISOR, is entitled Draft Environmental Impact Analysis for the Proposed Low Carbon Fuel Standard Regulation. Written comments on the Draft EIA will be accepted during a 45-day public review period starting on January 5, 2024, and ending on February 20, 2024.

Special Accommodation Request

Consistent with California Government Code section 7296.2, special accommodation or language needs may be provided for any of the following:

- An interpreter to be available at the hearing;
- Documents made available in an alternate format or another language; and
- A disability-related reasonable accommodation.

To request these special accommodations or language needs, please contact the Clerks' Office at *cotb@arb.ca.gov* or (916) 322-5594 as soon as possible, but no later than ten business days before the scheduled Board hearing. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

Consecuente con la sección 7296.2 del Código de Gobierno de California, una acomodación especial o necesidades lingü?sticas pueden ser suministradas para cualquiera de los siguientes:

- Un intérprete que esté disponible en la audiencia;
- Documentos disponibles en un formato alterno u otro idioma; y
- Una acomodación razonable relacionados con una incapacidad.

Para solicitar estas comodidades especiales o necesidades de otro idioma, por favor llame a la oficina del Consejo al *cotb@arb.ca.gov* o (916) 322-5594 lo m?s pronto posible, pero no menos de 10 d?as de trabajo antes del d?a programado para la audiencia del Consejo. TTY/TDD/Personas que necesiten este servicio pueden marcar el 711 para el Servicio de Retransmisión de Mensajes de California.

Agency Contact Persons

Inquiries concerning the substance of the proposed regulatory action may be directed to the agency representative Dillon Miner, 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.

Availability of Documents

CARB staff has prepared a Staff Report: Initial Statement of Reasons (ISOR) for the proposed regulatory action, which includes a summary of the economic and environmental impacts of the proposal. The report is entitled: Low Carbon Fuel Standard Regulation.

Copies of the ISOR and the full text of the proposed regulatory language, may be accessed on CARB's website listed below, on December 19, 2023. Please contact Chris Hopkins, Regulations Coordinator, at Chris.Hopkins@arb.ca.gov or (279) 208-7347 if you need physical copies of the documents. Pursuant to Government Code section 11346.5, subdivision (b), upon request to the aforementioned Regulations Coordinator, physical copies would be obtained from the Public Information Office, California Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, First Floor, Sacramento, California, 95814.

Further, the agency representative to whom non-substantive inquiries concerning the proposed administrative action may be directed is Chris Hopkins, Regulations Coordinator, (279) 208-7347. The Board staff has compiled a record for this rulemaking action, which includes all the information upon which the proposal is based. This material is available for inspection upon request to the contact persons.

Hearing Procedures

The public hearing will be conducted in accordance with the California Administrative Procedure Act, Government Code, title 2, division 3, part 1, chapter 3.5 (commencing with section 11340).

Following the public hearing, the Board may take action to approve for adoption the regulatory language as originally proposed, or with non-substantial or grammatical modifications. The Board may also approve for adoption the proposed regulatory language with other modifications if the text as modified is sufficiently related to the originally proposed text that the public was adequately placed on notice and that the regulatory language as modified could result from the proposed regulatory action. If this occurs, the full regulatory text, with the modifications clearly indicated, will be made available to the public, for written comment, at least 15-days before final adoption.

The public may request a copy of the modified regulatory text from CARB's Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, First Floor, Sacramento, California, 95814.

Final Statement of Reasons Availability

Upon its completion, the Final Statement of Reasons (FSOR) will be available and copies may be requested from the agency contact persons in this notice, or may be accessed on CARB's website listed below.

Internet Access

This notice, the ISOR and all subsequent regulatory documents, including the FSOR, when completed, are available on CARB's website for this rulemaking at https://ww2.arb.ca.gov/rulemaking/2024/lcfs2024

California Air Resources Board

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

Date: December 19, 2023

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).