

**Appendix C-3:
Summary and Response to Department of
Finance Comments on the Standardized
Regulatory Impact Assessment**

*Proposed Amendments to the Low Carbon Fuel
Standard Regulation*

Release Date: December 19, 2023

Addressing Department of Finance Comments

- 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 incentives¹ 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.²

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).³ 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

¹ 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>

² 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>

³ 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>

approved for using E15.⁴ However, some automakers have warned that using E15 may void vehicle warranties or cause damage to engines and fuel systems.⁵ Therefore, some 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.⁶ Similarly, expanded use of E85 in California has relied significantly on State and federal grants.⁷ 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.^{8,9,10} 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

⁴ 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>

⁵ 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>

⁶ Iowa Department of Agriculture & Land Stewardship, *Iowa Renewable Fuels Infrastructure Program*. (Accessed on October 10, 2023). <https://iowaagriculture.gov/IRFIP>

⁷ 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>

⁸ 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>

⁹ Bloomberg New Energy Finance, *Electric Vehicle Outlook 2023*. 2023. https://assets.bbhub.io/professional/sites/24/2431510_BNEFElectricVehicleOutlook2023_ExecSummary.pdf

¹⁰ 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>

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 electric vehicles have already closed the gap in terms of VMT.¹¹ 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.¹²

The Bloomberg New Energy Finance EV Outlook report⁹ 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 range of approximately 400 miles per year 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.¹³ The

¹¹ University of California, Davis, *Advanced Plug-in Electric Vehicle Travel and Charging Behavior Final Report*. April 10, 2020. https://csiflabs.cs.ucdavis.edu/~cjniitta/pubs/2020_03.pdf

¹² 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>

¹³ 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.¹⁴ 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 2020.¹⁵

Table 62 illustrates the splits for household, government, and business expenditures used in the analysis.

Table 62: Household, Business, and Government Share of Fuel Use

Entity	Gasoline and its substitutes	Diesel and its substitutes
Household Fuel Expenditures	92.0%	2.0%
Local Government Fuel Expenditures	0.75%	0.75%
State Government Fuel Expenditures	0.25%	0.25%
Business Fuel Expenditures	7.0%	97.0%

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, 2023.¹⁶ The interim projection released July 2023 has been incorporated into the macroeconomic results presented in the Initial Statement of Reasons.

¹⁴ California Air Resources Board, *2022 Edition of CARB’s GHG Emission Inventory, fuel combustion activity data.*

¹⁵ REMI Policy Insight Plus (v 3.0), State and Local government share of Employment.

¹⁶ 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.

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.