

Appendix C-2

Summary and Response to Department of Finance Comments on the Standardized Regulatory Impact Assessment

ACC II ISOR Appendix C.2:

Department of Finance comments on the SRIA and CARBs responses

- 1) **DOF Comment:** the SRIA assumes that, without the regulations, ZEVs make up a constant 12 percent of new vehicle sales starting in 2030, after increasing from 10.7 percent in 2026. However, this is inconsistent with current market trends and existing state regulations and manufacturers' commitment towards electrification. The share of ZEVs in California increased from 0.5 percent in 2011 to 12.4 percent in 2021 (based on the California Energy Commission's (CEC) New ZEV Sales dashboard). The baseline should continue to reflect an increasing share of ZEV sales beyond 2030 or the SRIA should provide a justification for assuming a constant share, as the current approach likely overestimates costs and benefits.

Staff response:

Traditionally, CARB staff estimate baseline projections of varying electric and other zero-emission vehicle technologies from what is expected as minimum compliance by automakers with California's ZEV regulation. The most recent version of CARB's vehicle fleet inventory used in the SRIA analysis, EMFAC2021, includes ZEV and PHEV sales from historic Department of Motor Vehicle (DMV) records for 2010 through 2019, and then projections for future years. The sales trends in EMFAC2021 show a growth in sales that can largely be attributed to the ZEV Regulation and automaker compliance, along with estimates from consumer-choice modeling of how buyers will respond to new vehicle market prices up to 2030. Although in recent years sales of ZEVs and PHEVs annually are higher than what is minimally required by the industry in each particular year, automakers rely on banked compliance credits for future year flexibility as ZEV Regulation requirements become stronger. In short, higher ZEV sales are a form of compliance but for use in a future model year.

However, for the revised analysis in this staff proposal, as described in Chapter X.A.2 of the accompanying Initial Statement of Reasons staff report, staff updated the ZEV technology fractions in the California baseline fleet based on new nationwide ZEV sales projections presented in the U.S. EPA Final Rule to Revise Existing National GHG Emissions Standards for Passenger Cars and Light Trucks Through Model Year 2026.¹ With this rulemaking, the U.S. EPA implemented new, more stringent GHG vehicle emission standards and estimated higher nationwide ZEV penetration rates in the future light-duty vehicle fleet to comply with them. CARB staff then adjusted the nationwide sales to reflect California's higher-than-average ZEV penetration rates. The

¹ 86 Fed. Reg. 74,434, Dec. 30, 2021.
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result is a ZEV baseline projection that exceeds what is seen in today's California market, as well as the projections in EMFAC2021. CARB staff flatline this projection from 2026 model year onwards, consistent with adopted regulations that reach maximum stringency in 2026 and flatline.

- 2) **DOF Comment: The SRIA assumes that private sector adoption of charging infrastructure will occur at a voluntary rate commensurate with the regulated new ZEV sales volume. Slower adoption may hinder consumers' willingness to purchase ZEVs and faster adoption may accelerate the rate at which benefits are realized. The SRIA should include a sensitivity analysis to show how impacts may vary under different infrastructure adoption scenarios or justify the current adoption rate assumption.**

Staff response:

Alternative 1 in the ACC II SRIA was chosen in part to reflect potential slower ZEV sales as a result of consumer barriers such as ZEV fueling infrastructure. This alternative is based on survey data that showed 30 percent of survey respondents rejected considering electric vehicle technology and showed hesitation in purchasing ZEVs or PHEVs.² Although this is a survey of vehicle buyers in early 2015, an important reason in survey response hesitation was limited access to fueling infrastructure.

CARB staff do not have methods to estimate specific ZEV sales as a function of available ZEV fueling infrastructure. Therefore, staff believe the Alternative 1 in the SRIA is sufficient to document a sensitivity of ZEV sales that could occur if charging and hydrogen infrastructure challenges arise. However, as described earlier in the main report, staff are encouraged by the substantial public infrastructure investments proposed with Federal and State funds and believe that supports the feasibility of the main proposal.

Separate from this alternative, staff did evaluate varying fueling costs for BEV owners with and without home charging access, which represents different cost impacts from alternative uses of fueling infrastructure. This was described in the appendix of the SRIA, and example results of select BEV owners are shown in Section 3.5 of the SRIA. Specifically, when accounting for higher public fueling costs for a BEV owner without access to cheaper home electricity, the ten-year overall savings was projected to be \$5,109 for a 2035 model year BEV, while the BEV driver with home refueling saved \$6,683 over the same time period. This shows that varying use of charging infrastructure, and the corresponding varying prices for electricity, affect driver savings, but that BEV ownership is advantageous in both bounding cases.

² Kurani, Kenneth, Nicolette Caperello, and Jennifer TyreeHapegeman. 2016. "New Car Buyers' Valuation of Zero-Emission Vehicles: California" (web link: https://ww2.arb.ca.gov/sites/default/files/2020-04/12_332_ac.pdf, accessed on October 18, 2021)
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- 3) **DOF Comment: The SRIA should disclose assumptions regarding the potential for refiners to increase gasoline exports as a result of domestic demand for gasoline decreasing, as this would lead to smaller benefits from reduced upstream emissions.**

Staff response:

In Section 2.1.4 of the SRIA, staff described the emission impacts from the production and delivery of fuel (upstream emission impacts). As DOF notes, CARB staff assumed oil well and gasoline refinery production would decline proportionately to gasoline demand in-state as a result of the regulation. However, in Figure 3 of that section in the SRIA, the portion of upstream emission impacts associated with each fuel type is itemized. By looking at the “liquid fuels” data in this figure, the reader can see the level of in-state emissions that would not be reduced if oil and refinery activity were to continue under baseline conditions, instead of declining (a bounding condition relative to CARB staff’s assumption).

Although staff cannot predict fuel provider operation decisions in future years, several recent California refinery changes provide indications of what fuel providers may do as gasoline demand declines. As gasoline and diesel demand dropped during the early period of the Covid-19 pandemic, the Marathon California refinery completely shut down instead of exporting fuel to other markets. Marathon is not restarting the refinery as the demand rises again, and instead is starting the permit process to entirely change the facility to produce renewable diesel (RD).³ Similarly, the SF Rodeo refinery in California is planning to shut down and is planning to shift to RD or possibly renewable jet fuel. It is not planning to export excess capacity.⁴

- 4) **DOF Comment: The SRIA should discuss why the “mid-demand” scenario from the CEC’s gasoline price projections is most representative despite significant anticipated reductions in gasoline demand, and the price trajectory of gasoline is assumed to be the same under the baseline and with the regulations.**

Staff response:

The “mid-demand” scenario was chosen as a reasonable scenario for this assessment because ex-ante we don’t have any knowledge of which of the three scenarios is more likely. Therefore, staff chose the mid-scenario, to avoid being overly pessimistic or overly optimistic. Based on CEC’s presentation of IEPR Transportation Energy

³ <https://www.marathonpetroleum.com/Newsroom/Company-News/Marathon-Petroleum-to-Proceed-with-Conversion-of-Martinez-Refinery-to-Renewable-Fuels-Facility/>

⁴ <https://www.phillips66.com/newsroom/rodeo-renewed-right-project-at-the-right-time>

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Forecast⁵ and on staff-level discussions between CARB and CEC, we understand that the difference in the gasoline price forecast across the three different scenarios is exogenous to the level electricity demand. This is why, counter-intuitively, the gasoline prices are higher in the “high [electricity]-demand” scenario, even though there is less gasoline demand relative to the mid-demand scenario. The “high-demand” scenario therefore, represents a gasoline price forecast that is most favorable to ZEV users, but not one that is most likely.

Staff does recognize that the significant reduction in gasoline demand has the potential to affect the price trajectory of gasoline in the future. However, trying to predict this effect is complex, and not something staff are able to do quantitatively. Gasoline prices will depend on the behavior of the world oil market, decisions of California refineries, and many other factors. To help better understand how much vehicle purchase behavior depends on increased vehicle prices and fuel cost-savings, staff has added an additional sensitivity analysis in Appendix D. This analysis suggests that even in a situation where ZEV buyers completely exclude any consideration of fuel savings, there is still a minimal change in ZEV purchases even with the increased vehicle cost.⁶ This bounding exercise suggests that even in the eventuality that there is a decreased price trend for gasoline, it is not expected to have a significant impact on overall ZEV sales.

DOF Comment: Comprehensive estimates of disparate impacts must be included.

a) Other groups of small businesses disproportionately impacted.

Staff response:

CARB staff do not have specific information on how the purchase and ownership of ZEVs will create disproportionate impacts on small businesses. The change in costs for company fleets are directly proportional to the number of vehicles each company owns. Although there are increased purchase costs in the early model years, for BEVs, there are substantial cost savings for operating BEVs. It is possible that some small businesses may lack sufficient access to capital to cover the increased purchase cost regardless of vehicle operating savings that occur at later times, but CARB does not have data to evaluate these unique business cases. Further, it is possible some businesses (large or small) cannot rely on BEVs given the nature of fleet operations and the use of their vehicles, and instead will need to rely on PHEVs that provide a gasoline fuel option. PHEVs are not projected to have vehicle ownership cost savings over a ten-year period, and also are projected to have higher incremental purchase

⁵ See staff presentation here: <https://www.energy.ca.gov/event/workshop/2021-12/session-2-iepr-commissioner-workshop-electricity-and-natural-gas-demand>

⁶ Appendix D, Table 10 shows that the reduction in vehicle sales, without considering ZEV skepticism, is only reduced by as much as 0.8% in 2034.

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costs. However, CARB staff believe BEV technology is evolving rapidly, will serve the vast majority of company fleet needs in the earlier years, and ultimately meet all fleet needs.

Separately, CARB is aware of potential impacts to independent transportation-related business that currently provide retail services or repairs for conventional vehicles. In addition to what was described in Section 2.2 of the SRIA (“Benefits to Typical Businesses” such as Tier 1 suppliers and ZEV fueling providers), and Section 5.3.1 of the SRIA (“California Employment Impacts” including gasoline station retail operations), the proposed regulation has a provision intended to benefit independent vehicle repair services (as compared to franchise auto dealer repair shops). Moreover, businesses may adapt to market demands, such as gasoline stations becoming ZEV charging facilities and expanding related retail services to generate revenue, consistent with the current practice of many gasoline stations of selling retail and convenience products as a dominant profit center.⁷ The ZEV Assurance provision that will require automakers to disclose service information is intended to make it easier for independent service businesses to transition to servicing ZEVs by reducing information barriers, such as data access and costs for employee training.

b) Some state and local government entities may be disproportionately impacted.

Staff response:

CARB staff are not able to precisely predict how the purchase and ownership of ZEVs may disproportionately impact state government agencies. State law (SB 498) already requires that no later than fiscal year 2024-205 the Department of General Services ensure 50-percent of light-duty vehicles purchased by state agencies are zero-emissions. Agencies for which ZEV purchases accelerate due to the proposed regulation may initially have increased purchase costs in the early model years, but there are also substantial cost savings for operating BEVs, which should ultimately benefit California residents by reducing state government vehicle costs. The State departments that own the greatest number of light-duty vehicles include the California Highway Patrol, Corrections and Rehabilitation, Fish and Wildlife, General Services, and Transportation. In 2019, these departments each owned over 10 percent of the non-disposed and non-confidential LDVs within the California State Vehicle Fleet.⁸

⁷ Cockett 2021. Cockett, Z., *Why most gas stations don't make money from selling gas*, <https://thehustle.co/the-economics-of-gas-stations/> Sept. 12, 2021

⁸ California Department of General Services. California State Fleet, 2015-2019. <https://data.ca.gov/dataset/california-state-fleet> January 6, 2021. Accessed March 28, 2022.

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Overall, the State government is estimated to have net savings in total cost of ownership (TCO) from ZEVs of \$230.7 million from 2026-2040).⁹

CARB staff do not have specific information on how the purchase and ownership of ZEVs will create disproportionate impacts on local government agencies. The change in costs for local government fleets are directly proportional to the number of vehicles each county, city, or district owns. Although there are increased purchase costs in the early model years, for BEVs, there are substantial cost savings for operating BEVs, which is a benefit to residents of these localities.

c) Potential for disproportionate impacts on lower income individuals.

Staff response:

As described in Chapter IX of the Initial Statement of Reasons staff report, ZEVs can be cheaper to own and maintain than conventional vehicles, reducing transportation costs that comprise a disproportionate share of spending for lower-income Californians. Proposed ZEV assurance and technical requirements enhance the likelihood that ZEVs will be more affordable, making them more likely to be used in place of conventional vehicles and thus reducing emissions. This includes a required convenience cord from automakers that can reduce the cost for home charging access, as well as a standardized fast charge port that will make charging infrastructure investments more efficient, which may lead to lower public charging costs.

Annual costs of ownership for BEVs specifically can be low, resulting in substantial savings, depending on the size of the BEV (vehicle class and battery size). A BEV passenger car with a range of 300-miles is less expensive than the comparable conventional vehicle in all ten years of ownership studied, and for the range of model years evaluated. Specifically, for both the 2026 model year and 2035 model year 300-mile BEV, the annual fuel and maintenance savings offset the annual loan costs of the vehicle purchase, even when accounting for higher electricity prices with a driver that solely relies on public charging prices.¹⁰ These savings from ZEVs relative to income are significantly higher for low-income households, Black, Indigenous, and People of Color, and households in areas with higher levels of pollution.¹¹ Furthermore, cost reductions in new ZEVs could also lead to decreased used ZEV prices and cost parity for low-income households, where the higher rates of depreciation for first owners will

⁹ Based on \$129.1 million in vehicle cost and \$359.8 million in operational savings (see Form 399 Attachment, Table 39).

¹⁰ Note these trends are not observed with the PHEV and FCEV passenger vehicles evaluated.

¹¹ ICCT 2021. Bauer, G., Hsu, C., Lutsey, N. The International Council on Climate and Transportation. When might lower-income drivers benefit from electric vehicles? Quantifying the economic equity implications of electric vehicle adoption. <https://theicct.org/publications/EV-equity-feb2021> February 2021. Accessed January 31, 2022.

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lead to larger benefits for second owners.¹²¹³ For details of the costs in these examples, refer to the BEV300 “without a home charger” in total cost of ownership tables, and the figures in Chapter IX of the ISOR staff report.

Knowing the potential of ZEVs for positive distributional impacts, CARB’s light-duty vehicle funding programs will likely shift to a further focus on harder to reach consumer segments and used vehicles, providing more benefit to communities with environmental justice concerns.¹⁴ Additionally, the regulation seeks to work in tandem with incentives and other programs to advance access to ZEVs for lower-income Californians. Staff are proposing regulatory incentives for automakers that take action to help improve environmental justice and equity outcomes as described in section III.C.5. Optional environmental justice vehicle values offered under the proposed ZEV regulation of the ACC II program are aimed at complementing CARB’s equity incentive programs. These actions include providing ZEVs and PHEVs at a discount to community clean mobility programs; retaining used ZEVs after leases in the California market for low-income vehicle purchasing and finance assistance programs; and offering lower-priced new ZEVs to the market. These optional provisions will help increase affordable access to ZEVs, particularly in communities with environmental justice concerns in California.

¹² Busch 2021. Busch, C. Energy Innovation Policy & Technology LLC. Used Electric Vehicles Deliver Consumer Savings Over Gas Cars: Policy Implications and Total Ownership Cost Analysis for Non-Luxury Used Cars Available To California Consumers Today. <https://energyinnovation.org/wp-content/uploads/2021/06/Used-Electric-Vehicles-Deliver-Consumer-Savings-Over-Gas-Cars.pdf> June 2021. Accessed January 31, 2022.

¹³ ICCT 2021b. Tankou, A., Lutsey, N., & Hall, D. The International Council on Climate and Transportation. Understanding and Supporting the Used Zero-Emission Vehicle Market. <https://theicct.org/wp-content/uploads/2021/12/ZEVA-used-EVs-white-paper-v2.pdf> December 2021. Accessed January 31, 2022.

¹⁴ CARB 2021. California Air Resources Board. Proposed Fiscal Year 2021-22 Funding Plan for Clean Transportation Incentives. https://ww2.arb.ca.gov/sites/default/files/2021-10/fy21-22_fundingplan.pdf Released October 2021. Accessed January 31, 2022.

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