

California State Motor Vehicle and Engine Pollution Control Standards; Advanced Clean Cars II; Waiver of Preemption

Supplemental Response to Comments

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Office of Transportation and Air Quality
U.S. Environmental Protection Agency

I. Introduction

On December 26, 2023, the Environmental Protection Agency (EPA) published a *Federal Register* notice announcing its receipt of the California Air Resources Board's (CARB's) request for a waiver of regulations applicable to new 2026 and subsequent model year (MY) California on-road light- and medium-duty vehicles, hereinafter the Advanced Clean Cars II (ACC II) regulations.¹ The notice for comment on this waiver request indicated that the request would be open for public comment until February 27, 2024. The Docket ID No. for the waiver is EPA-HQ-OAR-2023-0292. EPA also held a public hearing on the waiver request, and the transcript of that hearing is included in the docket. EPA has subsequently reached a final decision, as reflected in the "Decision Document," to waive preemption for CARB's ACC II regulations, pursuant to section 209(b) of the Clean Air Act (CAA). EPA announced the decision in the *Federal Register*. The *Federal Register* notice (Notice) noted EPA's decision within the waiver Decision Document that addresses the public comments relevant to EPA's evaluation of CARB's waiver request under the criteria set forth in section 209(b).² Also noted in EPA's *Federal Register* Notice of the waiver decision is this Supplemental Response to Comments document that together with the Notice and the waiver Decision Document comprise EPA's response and decision regarding CARB's ACC II waiver request.³

This Supplemental Response to Comments (SRTC) document is a compilation of a subset of the public comments submitted to the public docket as well as EPA responses to those comments. In general, many public comments that EPA considers non-germane to the criteria for

¹ 88 FR at 88908–88910 (Dec. 26, 2023).

² The waiver Decision Document can be found in the public docket at [regulations.gov](https://www.regulations.gov) at EPA-HQ-OAR-2023-0292.

³ The Supplemental Response to Comments (SRTC) document can be found at EPA-HQ-OAR-2023-0292.

waiver consideration and our responses to those comments are contained in this SRTC and are incorporated by reference into the waiver decision.

The responses in this SRTC document augment the rationale and responses to comments in the waiver Decision Document and address comments not discussed there. To the extent there is any confusion or apparent inconsistency between this SRTC document and the waiver Decision Document, the waiver Decision Document itself remains the definitive statement of the rationale for the waiver decision. This document, together with the waiver Decision Document, should be considered collectively as EPA's response to all the significant comments submitted on the waiver request.

II. EPA's Consideration of Additional Comments Raised

EPA has consistently interpreted CAA section 209(b) as requiring EPA to grant a waiver unless EPA or opponents of a waiver can demonstrate that one of the criteria for a denial has been met.⁴ In this context, since inception, EPA has recognized its limited discretion in reviewing California waiver requests. Therefore, EPA's role upon receiving a request for waiver of preemption from California has consistently been limited and remains only to determine whether it is appropriate to make any of the three factual findings specified by the CAA, as amended.⁵ If EPA cannot make at least one of the three findings, then the waiver must be granted.

⁴ *MEMA I*, 627 F.2d at 1120–21 (“The language of the statute and its legislative history indicate that California’s regulations, and California’s determination that they comply with the statute, when presented to the Administrator are presumed to satisfy the waiver requirements and that the burden of proving otherwise is on whoever attacks them.”); *MEMA II*, 142 F.3d 449, 462–63 (D.C. Cir. 1998) (“[S]ection 209(b) sets forth the only waiver standards with which California must comply. . . . If EPA concludes that California’s standards pass this test, it is obligated to approve California’s waiver application.”).

⁵ 42 U.S.C. §§ 7401 *et seq.* (1970), as amended. CAA section 202 is 42 U.S.C. § 7521 and CAA section 209 is 42 U.S.C. § 7543.

Additionally, in previous waiver decisions, EPA has noted that CAA section 209(b)(1) specifies particular and limited grounds for rejecting a waiver and has therefore limited its review to those grounds.⁶ EPA has also noted that the structure Congress established for reviewing California's standards is deliberately narrow, which further supports this approach. This has led EPA to reject arguments that are not specified in the statute as grounds for denying a waiver:

The law makes it clear that the waiver requests cannot be denied unless the specific findings designated in the statute can properly be made. The issue of whether a proposed California requirement is likely to result in only marginal improvement in air quality not commensurate with its cost or is otherwise an arguably unwise exercise of regulatory power is not legally pertinent to my decision under section 209, so long as the California requirement is consistent with section 202(a) and is more stringent than applicable Federal requirements in the sense that it may result in some further reduction in air pollution in California. Thus, my consideration of all the evidence submitted concerning a waiver decision is circumscribed by its relevance to those questions that I may consider under section 209(b).⁷

EPA has received a number of comments that it believes are beyond the scope of the three waiver criteria in CAA section 209(b)(1). This SRTC is part of the Administrator's decision as set forth in the waiver Decision Document relating to the final decision on CARB's waiver request for the ACC II regulations. The SRTC addresses a number of issues that have been raised in the context of whether the ACC II regulations are consistent with CAA section 202(a) (the third waiver criterion) but in fact are beyond the narrow scope of EPA's review. This review considers whether the opponents have met their burden of proof to demonstrate that either (1) the requisite vehicle emission control technologies are unavailable; (2) to the extent the technologies are unavailable, is there adequate lead time to develop such technologies; and (3)

⁶ See, e.g., 78 FR at 2112 (January 9, 2013); 87 FR at 14332 (March 14, 2022) (SAFE 1 Reconsideration Decision).

⁷ 78 FR at 2115 (footnote omitted).

whether the cost to develop and implement the vehicle emission control technologies is unreasonable.

EPA's traditional approach is mandated by the statute. CAA section 209(b)(1)(C) requires only that California's program be consistent with CAA section 202(a). CAA section 202(a), however, does not identify any of the additional topics raised by commenters (beyond feasibility of vehicle technologies, lead-time, and cost to regulated entities).⁸ For example, while CAA section 202(a) articulates various statutory factors that must be considered in setting motor vehicle emissions standards, it does not require consideration of many topics raised by commenters, such as consumer acceptance, marketability, grid reliability, charging infrastructure, liquid fuels industry impacts, lifecycle analysis, tax revenues, or effects on environmental justice communities. Nor do the statute's references to terms like "costs of compliance" or "public health and welfare" mandate consideration of these other topics in the standard-setting process.⁹ Thus, consistency with CAA section 202(a) does not mean California must consider these factors, and EPA cannot deny a waiver based on these factors.

EPA recognizes that these topics may potentially be relevant to EPA's own rulemaking process for motor vehicle emission standards. Indeed, EPA considered some of these topics in

⁸ As we explain in the waiver Decision Document Section III.C, the third prong requires only consistency, not perfect compliance, with CAA section 202(a). Thus, even if a factor is mentioned in CAA section 202(a), the third prong's consistency requirement may not require California to comply with that factor.

⁹ *See, e.g., MEMA I*, 627 F.2d at 1117-18 ("Section 209's reference to 'public health and welfare' refers only to the impacts associated with air pollution, as opposed to the social costs of pollution control."); *id.* at 1118 ("Similarly, there is no indication that Congress intended section 202's 'cost of compliance' consideration to embody 'social costs' of the type petitioners advance. Every effort at pollution control exacts social costs. Congress, not the Administrator, made the decision to accept those costs. Section 202's 'cost of compliance' concern, juxtaposed as it is with the requirement that the Administrator provide the requisite lead time to allow technological developments, refers to the economic costs of motor vehicle emission standards and accompanying enforcement procedures. It relates to the timing of a particular emission control regulation rather than to its social implications. Congress wanted to avoid undue economic disruption in the automotive manufacturing industry and also sought to avoid doubling or tripling the cost of motor vehicles to purchasers. It therefore requires that emission regulations be technologically feasible within economic parameters. Therein lies the intent of the 'cost of compliance' requirement.").

our recently promulgated Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles (the LMDV Multipollutant Rule).¹⁰ However, as explained in the waiver Decision Document for this decision, EPA’s role in adjudicating CAA section 209(b) waivers is not to evaluate the overall reasonableness of California’s program. Congress intentionally designed the waiver provision such that EPA must grant the waiver unless the Administrator can make one of the statutory findings. The statutory text, context, history, and purpose are unmistakably clear on this point, and are further corroborated by decades of regulatory history and caselaw.¹¹ Commenters asking EPA to consider these additional topics failed to persuasively address the statute and caselaw, and in most cases, failed to even recognize the law on these points.

Nonetheless, given the considerable interest commenters displayed in these topics, EPA is providing a summary and response to the comments on these issues, which include consumer acceptance and marketability of zero-emissions vehicles (ZEVs), impacts on the electric grid, the availability of public charging infrastructure, costs other than vehicle technology costs (such as consumer costs, charging infrastructure costs, electricity costs, and cost-benefit analyses), and other topics. Although these factors are not relevant to the third prong inquiry, EPA is nonetheless evaluating the comments as a factual matter, based on the waiver request from CARB and the administrative record. CARB’s waiver request and rulemaking record provide a reasonable and reasonably explained analysis related to these additional topics. In most cases, the

¹⁰ 89 FR 27842 (Apr. 18, 2024).

¹¹ *See, e.g.*, MEMA I, 627 F.2d at 1124 n.56 (“[T]he Administrator has no broad mandate to assure that California’s emissions control program conforms to the Administrator’s perceptions of the public interest. Absent the contingency that he is able to make contrary findings, his role with respect to the California program is largely ministerial.”); *id.* at 1124 (“[W]hether the [CARB] regulations were themselves arbitrary and capricious ... is not a question for the Administrator or this court.”).

comments are only raised skeletally and without the benefit of supporting data and analysis. In the few cases where the comments did provide actual supporting data and analysis, EPA finds that the opponents of the waiver did not meet their burden of proof, upon the weight of the evidence, to demonstrate that California was unreasonable in its analysis and conclusions. Thus, even hypothetically assuming these additional topics were relevant to the third prong inquiry, EPA finds that the waiver opponents have failed to show that any of these additional issues creates an inconsistency with CAA section 202(a).

A. Consumer Acceptance and Marketability of ZEVs

Comments regarding consumer acceptance and the marketability of ZEVs encompassed several topics, which we have grouped into the following categories: consumer choice, consumer demand and related factors, and consumer impacts and market considerations. In the following sections, EPA summarizes comments by topic, including comments and information submitted by CARB. In the final sub-section, EPA provides a response to these comments.

1. Consumer Choice

Many comments addressed consumer choice, that is, the availability, quantity, and variety of vehicles from which consumers may choose in the marketplace. Some commenters asserted that vehicle choice will be diminished by California's ZEV standards, especially in later model years. Their arguments were generally rooted in the belief that, as stated by one commenter, "CARB's ACC II program ... severely [limits] consumer choice in the early years and practically [mandates] the elimination of ICE [internal combustion engine] vehicles in future years."¹² Several commenters explicitly characterized the ACC II regulations as an ICE vehicle (ICEV) ban or ZEV mandate. Regarding natural gas and biofuels, one commenter asserted that

¹² American Petroleum Institute (API), EPA-HQ-OAR-2023-0292-0174, p.15.

CARB will not allow, for example, vehicles “powered using carbon-negative renewable natural gas” and “deeply carbon-negative biofuels.”^{13,14}

Contrary to some commenters’ claims, CARB has explained that the ACC II regulations are not an “ICE ban” or a “ZEV mandate.” CARB states that “the LEV IV regulation sets a performance standard without specifying particular technologies, allowing flexibility in compliance methods.... Similarly, the ZEV regulation outlines emission levels or requirements for ZEVs without prescribing a singular technology, providing options for manufacturers to certify all the known zero-emission platforms of battery-electric vehicles (BEVs), plug-in hybrid-electric vehicles (PHEVs), and fuel cell-electric vehicles (FCEVs) and encouraging innovation in cost-effective strategies for meeting the zero-emission requirements.”¹⁵ CARB maintains that the ACC II regulations are performance-based, non-prescriptive, and flexible; and, as such, the standards allow for innovation. ICE-only vehicles will continue to be driven and bought and sold in the new and used vehicle market for many years to come, and new vehicle sales for model year 2035 and later can include up to 20% PHEVs, which contain ICEs. Moreover, nothing in the CARB regulations preclude a manufacturer from complying by zero-emission ICEVs, to the extent such technologies become available in the future.

¹³ Transfer Flow, Inc., EPA-HQ-OAR-2023-0292-0223, p.8.

¹⁴ In addition to our general responses below about consumer choice, we further note that the comments regarding biofuels overlap substantially with the comments regarding CARB’s protectiveness determination and whether CARB must account for lifecycle impacts. That is, combusting biofuels in internal combustion engine vehicles produces significant tailpipe emissions, and any claims regarding such biofuels having negative or zero emissions necessarily depend on lifecycle assessments. However, as we explain in Section III.A of the waiver Decision Document, CARB is not required to account for lifecycle impacts (generally, or for fuels specifically) in establishing its motor vehicle emissions standards, which properly focus on reducing emissions from motor vehicles themselves. Moreover, we note that the CAA provides a separate program for fuels, including biofuels, see 42 USC 7545, (o), (o)(12), as does the State of California through its Low Carbon Fuel Standard and other fuel programs. Furthermore, as we explain in Section II.E of this document, CARB did in fact evaluate lifecycle impacts of ZEVs compared to ICE vehicles.

¹⁵ CARB Public Hearing Response, EPA-HQ-OAR-2023-0292-0227, p.7.

Many commenters noted that the availability of new BEV, PHEV, and FCEV options is increasing and expanding to include a variety of vehicle powertrains, models, and attributes and features for consumers to choose from. For example, one commenter stated that “dozens of new models in all vehicle segments are entering the market now.”¹⁶ In addition, many commenters stated that the standards are achievable within the timeframe covered resulting in expanded choice and reduced vehicle costs, and highlighted programs intended to support low-income, disadvantaged, and other communities burdened by transportation costs and/or inaccessibility. For example, a commenter stated that the ACC II regulations will “help satisfy increasing market demand for and expand the market availability of cost-effective ZEVs, which will only become more affordable and more accessible as battery prices continue to drop.”¹⁷ Furthermore, according to CARB’s comments, “by the end of model year 2021, there were already 60 ZEV and PHEV models available, including options at lower price points and a variety of sizes.”¹⁸ “Consumers can and are choosing from an increasing number of zero-emission and plug-in hybrid models across manufacturers, with 103 distinct ZEV and PHEV models from 38 distinct makes sold in California in 2023 nearly a 70% increase in model availability from 2019.”¹⁹ Another commenter stated that strong consumer demand and choice of models are driving the levels of ZEV adoption seen in California today.²⁰ A commenter representing fleet owners and operators who are seeking an increased supply of commercial ZEVs for their fleet operations

¹⁶ Environmental and Public Health Organizations, EPA-HQ-OAR-2023-0292-0234, p.61.

¹⁷ U.S. Climate Alliance, EPA-HQ-OAR-2023-0292-0116-0004, p.2.

¹⁸ CARB Public Hearing Response, p.6.

¹⁹ CARB Testimony of P.C. Brehler, EPA-HQ-OAR-2023-0292-0046, p.1.

²⁰ Environmental and Public Health Organizations, p.14.

commented in support of the ACC II regulations as critical to bridging the gap between supply and demand.²¹

On the production side of choice, that is, the vehicles that automobile manufacturers (“Original equipment manufacturers” or OEMs) are offering in the market, several commenters asserted that OEMs are pulling back on ZEV production and investments whereas other commenters stated that OEMs are ramping up production of ZEVs and/or investments. For example, a commenter stated that “manufacturers are rolling back their prior commitments” and that “the ACC II regulations rely on outdated OEM commitments.”²² In contrast, many other commenters point to OEMs expanding their ZEV commitments. A commenter noted that “even companies that had previously urged caution on EV commitments are shifting towards greater electrification.”²³ CARB stated that “virtually all light-duty vehicle manufacturers have made commitments to electrify their product lines” with California leading the U.S. in ZEV and PHEV market share, reaching “nearly 27% EV market share” in the third quarter of 2023.²⁴ Countering claims that the ACC II regulations depend exclusively on outdated OEM commitments, CARB attributed increasing demand to many factors, including “regulatory requirements, advancements in technology, a widening array of ZEV and PHEV models, manufacturer commitments, and the State's robust infrastructure and incentives for electric vehicles.”²⁵

In its Waiver Request Support Document, CARB points to increasing vehicle choice and consumer demand. Specifically, they state and substantiate that “ZEV technology is steadily improving, costs are declining, manufacturer investments are expanding, and consumer demand

²¹ Ceres, EPA-HQ-OAR-2023-0292-0176, p.1.

²² Valero Energy Corporation (Valero), EPA-HQ-OAR-2023-0292-0229, p.7 of attachment A; Valero, p.2.

²³ Zero Emission Transportation Association (ZETA), EPA-HQ-OAR-2023-0292-0199, p.50.

²⁴ CARB Public Hearing Response, p.6.

²⁵ *Id.*

is growing. The ZEV standards can be met in the time provided.”²⁶ In addition, CARB sums up vehicle choice as follows: “Looking to the future of electric drive technologies in the 2026 to 2035 model year timeframe, it is anticipated that there will be even greater efficiency improvements, longer ranges, and comparable vehicle offerings and capabilities across all passenger car and truck categories and comparable costs to conventional vehicles with internal combustion engines.”²⁷ In the 2025 model year, CARB “projects that there will be 179 compliant ZEV and PHEV models available.”²⁸

In response, some commenters assert that consumer choice will be diminished by the ACC II regulations. These commenters have not provided persuasive evidence that this will be the case. In combination with the supportive comments cited above, CARB has assessed the existing market for ZEVs and is projecting continued growth in the ZEV market, including vehicles with the attributes that consumers desire (*e.g.*, range, affordability, wide range of vehicle segments). EPA notes that while the issue of consumer choice is not within the scope of our review under CAA section 209(b)(1), we nevertheless have assessed this issue and conclude that, even if it were a criterion relevant to our review, that commenters have not met their burden to produce the evidence necessary for EPA to find that the ACC II regulations are not consistent with CAA section 202(a).

2. Consumer Demand and Related Factors

Comments related to consumer demand addressed the importance of consumers’ ability to meet their needs, satisfy their preferences, match vehicle attributes to their purchase criteria, and purchase or lease ZEVs. For example, one commenter asserted that “ACC II flies in the face

²⁶ CARB Waiver Request Support Document, EPA-HQ-OAR-2023-0292-0034, p.50.

²⁷ *Id.*, p.40.

²⁸ *Id.*, p.52.

of consumers having the freedom to purchase the vehicles that best suit their personal needs and those of their families.”²⁹ In addition, another commenter claimed that the ACC II regulations are “attempting to drive consumers to purchase products they aren't ready to accept, [and] they can't afford to purchase.”³⁰ Yet another commenter stated that “CARB's ACC II ZEV mandate is not aligned with a reasonable expectation of the growth of consumer demand for EVs.”³¹ Commenters also addressed specific subsets of consumers, such as rental car customers and victims of “the devastating Camp Fire that burnt down the town of Paradise, California.”³² According to those commenters, “electric cars do not meet rental customer needs [as] borne out by recent surveys,”³³ and “the citizens affected by these wildfires don't want electric vehicles.”³⁴

EPA notes the differing needs of vehicle consumers, the unique circumstances under which people rely on their vehicles, and how diversity in needs affects demand for different types of vehicles. That said, as with comments related to vehicle choice, these and similar comments appear not to reflect fully the nature of the ACC II regulations. As noted in the previous section, CARB has clarified that the ACC II regulations are not an ICE ban. The ACC II regulations are performance-based, non-prescriptive, flexible, and allow for innovation. ICE-only vehicles will continue to be driven and bought and sold in the new and used vehicle market for many years to come, and up to 20% of new vehicles sold under the ACC II regulations could be PHEVs.

²⁹ Specialty Equipment Market Association (SEMA), EPA-HQ-OAR-2023-0292-0163, p.5.

³⁰ Consumer Energy Alliance (CEA), EPA-HQ-OAR-2023-0292-0059, p.1.

³¹ National Automobile Dealers Association (NADA), EPA-HQ-OAR-2023-0292-0173, p.4.

³² Transfer Flow, Inc., p.7.

³³ American Car Rental Association (ACRA), EPA-HQ-OAR-2023-0292-0222, p.7.

³⁴ Transfer Flow, Inc., p.7.

We proceed with this discussion of consumer demand and related factors as follows. First, we summarize comments related to vehicle sales and survey results. Then we summarize comments related to vehicle attributes, including costs and costs savings for consumers, range, and other vehicle attributes. Third, we summarize comments regarding ZEV and ZEV-related policies, investments, and programs, and end with a short summary of comments on consumer and market impacts. For each of these topics, we include comments and information submitted by CARB. We close this section with EPA’s response to comments on consumer issues.

a. Demand: Vehicle Sales and Surveys

A primary way in which commenters discuss demand is through ZEV sales statistics. Several commenters provided historical ZEV sales statistics, with some using those sales statistics to argue against the waiver and others using those statistics to argue in favor of the waiver. Some argued that recent variability in ZEV sales, specifically dips in sales, demonstrate that demand for ZEVs is waning. For example, one commenter concluded that “customers are not embracing the move to electric propulsion vehicles as previously anticipated,”³⁵ while another stated that “customers simply do not want to buy current electric cars, which is why those vehicles are piling up on dealer lots.”³⁶ Looking forward, another commenter asserted that “the proposed standards ‘are neither reasonable nor achievable in the timeframe covered’” and described BEV sales assumptions as “unrealistic.”³⁷

In contrast, other commenters cited dramatic growth in ZEV sales and expectations for continued growth. For example, “global annual EV sales climbed to over 13.6 million units in 2023, which accounted for 16% of total car purchases. This increase represents a roughly 30%

³⁵ SEMA, p.2.

³⁶ ACRA, p.7.

³⁷ Valero, p.13.

increase from the previous year's total of 10.5 million vehicles. Overall, 2024 automotive forecasts from AutoPacific, Cox Automotive, and S&P Global Mobility show increases in EV sales ranging from 20%-30% for the year.”³⁸ According to one commenter, EV sales in the U.S. outpaced the anticipated market share projected by the U.S. Energy Information Administration (EIA) for MY 2026.³⁹ This commenter also noted that “in 2023, while the entire U.S. vehicle market was up 13% [year-over-year], the EV market was up almost 50% [year-over-year].”⁴⁰ California has the highest ZEV sales of any state. “California's adoption of ZEVs has significantly surpassed the national market, and, in 2023, California ZEV sales were 25% of all light-duty vehicle sales in the state.”⁴¹

Importantly, none of these commenters establish and substantiate, with certainty, the path of future sales or EV acceptance via an extension of historical observations. Indeed, another commenter noted that “consumer sales shares ... is likely an inadequate proxy for actual consumer interest in ZEVs”⁴² Instead, market penetration of new technology is likely to “follow a S curve leading to a much more rapid pace of adoption between now and when the ACC II regulations take hold.”⁴³ This suggests that ZEV adoption is likely to outpace predicted sales trajectories that simply extend historical sales statistics. For example, “a recent study published in the *Proceedings of the National Academies of Science* found that consumer valuation of increased range and lower prices will lead EVs to being the majority of vehicles sold by 2030” nationally, with California already leading in ZEV sales.”⁴⁴

³⁸ ZETA, p.9.

³⁹ Tesla, Inc., EPA-HQ-OAR-2023-0292-0197, p.7.

⁴⁰ *Id.*, p.7.

⁴¹ *Id.*, p.7.

⁴² Environmental and Public Health Organizations, p.49.

⁴³ Tesla, Inc., EPA-HQ-OAR-2023-0292-0197, p.7.

⁴⁴ *Id.*, p.7.

According to CARB comments, “when CARB submitted its waiver request ... zero-emission vehicle sales were surpassing requirements.”⁴⁵ Furthermore, “data from the third quarter of 2023 show that this consumer demand continues to grow, with California ZEV and PHEV sales reaching 26.7% of total vehicle sales.”⁴⁶ Furthermore, in its waiver request, CARB demonstrates, with ZEV sales statistics, that consumer demand for ZEVs has been growing. CARB expects that demand for ZEVs will continue to grow and expresses confidence that “ZEV standards can be met in the time provided.”⁴⁷

Commenters also provided survey results in response to the waiver request. First, we note that the breadth of survey designs (*e.g.*, sample, size, questions, framing) is large. Second, most commenters cited survey results to support the waiver. However, there were exceptions. For example, a commenter stated that among business travelers “eighty-one percent of these customers *never* choose to rent an electric car, and only 1% always do.”⁴⁸ Another commenter cited a 2021 and 2023 survey of 1,000 automobile executives in 30 countries, which showed a drop in estimates of new EV sales in the U.S. from 52% of the new vehicle market in 2030 to 33%.⁴⁹

In contrast, in a national survey conducted in early 2022, Consumer Reports found that “[o]verall interest in EVs is high” across all racial demographics. ... “Between 33% and 52% of respondents (depending on racial demographics) would ‘definitely’ or ‘seriously consider’ purchasing or leasing a ZEV as their next vehicle. Only 28% of Americans would not consider getting an electric-only vehicle if they were to buy or lease a vehicle today. Even in rural areas,

⁴⁵ CARB Testimony of P.C. Brehler, p.1.

⁴⁶ *Id.*, p.1.

⁴⁷ CARB Waiver Request Support Document, p.50.

⁴⁸ ACRA, p.7.

⁴⁹ Valero, p.14.

the survey showed that current interest in ZEV purchases is high, with up to 29% of rural drivers at least seriously considering buying or leasing a ZEV.”⁵⁰ Among surveys of specific groups, demand for ZEV appears to be more pronounced. For example, “94% of [Uber] drivers have reported a positive experience with their EV ... up to 93% of them would choose an EV as their next vehicle according to a survey of Uber drivers.”⁵¹ In a survey conducted between December 2022 and February 2023, “90% of EV owners said it is ‘likely’ or ‘very likely’ that their next purchase will be another ZEV.”⁵² In another survey, “84% of American car dealers surveyed agreed that electric vehicles are the future.”⁵³ Finally, in a survey-based, consumer discrete choice experiment designed to mitigate typical concerns of stated-preference methods,⁵⁴ Forsythe *et al.* (2023) found that when consumers' basic demands for vehicle attributes are met, they accept or prefer BEVs to combustion vehicles.⁵⁵

In its comments, CARB does not refer to survey results, but instead provided ZEV sales data, as described above. In addition, CARB also does not refer to survey results in their Waiver Request Support Document. Furthermore, while surveys can be informative, survey results do not form a basis for EPA’s technical decision regarding this waiver request.

b. Demand: Vehicle Attributes

Some commenters called attention to attributes of ZEVs that historically have been key considerations for ZEV adoption, namely costs and costs savings for consumers and range. More generally, some commenters asserted, for example, that “consumers don’t want to buy electric

⁵⁰ Environmental and Public Health Organizations, p.53.

⁵¹ ZETA, p.9.

⁵² Environmental and Public Health Organizations, p.72.

⁵³ *Id.*, p.54.

⁵⁴ Specifically, the design in Forsythe *et al.* (2023) mimicked the process of comparing vehicles on an automaker's website.

⁵⁵ Environmental and Public Health Organization, p.50.

cars because they are not as convenient and desirable as comparable internal-combustion cars.”⁵⁶ Costs and cost savings topics include, for example, purchase price, ownership costs (*e.g.*, operating, maintenance, repair), and affordability. Some commenters point to the historically higher purchase price of ZEVs. For example, one commenter alluded to higher costs for EVs compared to ICEVs and asserted that the ZEV requirements would “eliminate many of the affordable vehicles currently in the market.”⁵⁷ Another commenter stated that “most American households find the cost of new vehicles out of reach,”⁵⁸ a situation that is further exacerbated by high ZEV prices, high interest rates, uncertain residual values, and what another commenter characterized as “volatility and uncertainty with used ZEVs.”⁵⁹ Some commenters questioned the accuracy of ownership costs estimated by CARB, citing lower savings on ZEV operating costs, maintenance, and repair, and higher rates of depreciation for ZEVs compared to conventional vehicles. One commenter stated that the timing of cost parity between ZEVs and conventional vehicles is becoming longer, citing a survey of 1,000 automobile executives in 30 countries.⁶⁰

In contrast, other commenters pointed to market conditions that motivate consumer ZEV demand, such as expectations for growing offerings of ZEVs at lower price points and a variety of sizes (see discussion of consumer choice above), the narrowing gap between ZEV prices and conventional vehicle prices for various vehicle types, ZEV ownership cost savings, and the value of the market certainty provided by the ACC II regulations in spurring further ZEV demand which in turn could bring down ZEV purchase and operating costs. For example, a commenter noted that “providing market certainty through a sales requirement will *drive investment in clean*

⁵⁶ ACRA, p.18.

⁵⁷ Dealership Services Direct, EPA-HQ-OAR-2023-0292-0196, p.2.

⁵⁸ NADA, p.5.

⁵⁹ ACRA, p.7.

⁶⁰ Valero, p.13 of attachment.

transportation technologies and infrastructure, leading to cost reductions and increased accessibility to clean transportation options, especially for underserved communities.”⁶¹ Another commenter stated that “ZEVs offer a lower total cost of ownership than their internal combustion engine counterparts in a growing number of use cases. Meanwhile, electricity prices are more stable than gasoline prices, making fuel costs in ZEVs easier to predict and budget.”⁶² In addition, a third commenter stated that “ZEVs are increasingly favorable from an operating cost and total cost of ownership (TCO) perspective, a factor that is very important to U.S. and California consumers when deciding which vehicles they want to buy.”⁶³ They cite cost of ownership analyses conducted by Argonne National Laboratories (ANL) and the International Council on Clean Transportation (ICCT). This commenter also described a survey from 2019 and 2020 that “found very significant self-reported consumer savings on repair and maintenance. The data from surveys of thousands of Consumer Reports members revealed that ‘BEV and PHEV owners are paying half as much as combustion vehicle owners are paying to repair and maintain their vehicles,’ with lifetime savings for ZEVs over combustion vehicles being approximately \$4,600.”⁶⁴ Furthermore, a June 2023 J.D. Power survey also indicated that consumers are recognizing these savings, finding that “[t]he more miles that vehicle owners drive, the more likely they are to consider an EV. As in prior-year studies, daily commuters faced with higher fuel expenses are trading in their gas-powered vehicles for EVs.”⁶⁵

For some consumers, savings could begin with purchase price, according to other commenters, who expect more lower priced ZEV options to come into the market as vehicle

⁶¹ CALSTART, EPA-HQ-OAR-2023-0292-0224, p.1.

⁶² Aspen One, *et al.*, EPA-HQ-OAR-2023-0292-0198, p.1.

⁶³ Environmental and Public Health Organizations, p.60.

⁶⁴ Environmental and Public Health Organizations, p.63.

⁶⁵ *Id.*, p.61.

choice expands. For example, “Forsythe *et al.* (2023) ... found that reductions in the ZEV price-premium, which are projected to occur, ‘have driven substantial increases in consumer choices of BEV cars and SUVs over their conventional gasoline vehicle counterparts.’”⁶⁶ In addition, a commenter observed that “automakers are taking different approaches to provide more options for differing consumer demands of lower cost and increased range,” including “shorter-range BEVs [that] can increasingly be attractive to a broader group of drivers.”⁶⁷ Furthermore, Gillingham *et al.* (2023) concluded that “EVs can make up a large market share in the U.S. new car market,” and “there is a great deal of untapped product space for EVs in the lower price brackets.”⁶⁸ Another commenter cited cost competitiveness of ZEVs with ICEVs and suggested that cost parity on a cost of ownership basis as well as a purchase price basis is imminent due to a number of factors including continued declines in battery cost, Inflation Reduction Act (IRA) credits, economies of scale, and increasing diversity of ZEV vehicle models.⁶⁹

CARB conducted a total cost of ownership analysis for BEVs accounting for a number of cost factors, including vehicle price, loan fees, sales taxes and registration fees, fuel costs, maintenance costs, and a home charger capital investment for some buyers. Over 10 years, CARB estimates that consumers will save approximately \$3,200 to \$8,800, with savings realized beginning in the first year of ownership.”⁷⁰ In its supplemental comments, CARB described comments that disagree with CARB’s estimates of total cost of ownership as “vague and

⁶⁶ *Id.*, p.61.

⁶⁷ International Council on Clean Transportation (ICCT), EPA-HQ-OAR-2023-0292-0169, p.5.

⁶⁸ Environmental and Public Health Organizations, p.62.

⁶⁹ ZETA, pp.10–12.

⁷⁰ CARB Public Hearing Response, p.7; California Office of the Attorney General *et al.* (States and Cities), EPA-HQ-OAR-2023-0292-0235, p.26.

unsubstantiated” and stated that commenters “provide no evidence of technological infeasibility.”⁷¹ CARB also reiterated that it has addressed such costs in its rulemaking record.⁷²

In addition, CARB’s Waiver Request Support Document states that the ACC II regulations “ensure that emission reductions ... are permanent by imposing ZEV assurance measures,” including range requirements, durability requirements, warranty, serviceability, charging, data requirements, and battery labeling, “to help ensure that consumers can successfully replace their conventional vehicles with new or used ZEVs and PHEVs.”⁷³ CARB also demonstrates that the ACC II regulations support affordability. According to CARB’s Waiver Request Support Document, manufacturers can, for example, “meet part of their requirements by providing ZEVs at reduced prices to community mobility programs,” selling previously leased ZEVs to dealerships participating in a financial assistance program, and “offering ZEVs at reduced prices to enhance affordable access to clean transportation.”⁷⁴

Regarding range, insufficient vehicle range has historically been cited as one of the ways in which ZEVs fail to meet the needs of consumers. However, commenters note that average ZEV range has grown, with the typical range of new ZEVs exceeding the daily needs of most drivers on most days, and pre-purchase range concerns disappear following ZEV purchase. Some commenters believe that range, practically and technologically, appears to no longer be an issue – something that consumers realize after purchase. For example, “[a] study by AAA found that once drivers own an EV, their previously held concerns (*e.g.*, range anxiety, cost, lack of

⁷¹ California Office of the Attorney General (CARB Supplemental Comment), EPA-HQ-OAR-2023-0292-0540, p.17.

⁷² CARB, Standardized Regulatory Impact Assessment (SRIA) (Mar. 29, 2022), EPA-HQ-OAR-2023-0292-0021, pp.86–98; ACC II FSOR, Appendix F, Updated Costs and Benefits Analysis (“ACC II FSOR Appendix F”), EPA-HQ-OAR-2023-0292-0019, pp.16–17.

⁷³ CARB Waiver Request Support Document, p.16.

⁷⁴ CARB Waiver Request Support Document, p.54.

charging) largely disappear. For example, 77% said they had little to no range anxiety after owning an EV.”⁷⁵

Regarding vehicle range, CARB’s Waiver Request Support Document states that “[t]he median driving range of BEVs has increased from 68 miles for 2011 model year to 234 miles in the 2021 model year. There are BEV models certified for the 2022 model year to a maximum range of 520 miles, such as the Lucid Air. While the median range for gasoline vehicles was 403 miles, as more long-range BEVs become available the discrepancy in ranges between gasoline-powered vehicles and BEVs is likely to narrow. ... FCEVs currently on the market have more than 300 miles of range, ... [and] PHEV technology also continues to evolve as manufacturers introduce different architectures and all-electric capabilities in response to consumer demand for a more all-electric experience.”⁷⁶

Regarding other ZEV attributes, comments were generally positive. For example, a commenter cited Forsythe *et al.* (2023), who concluded that "any perceived disadvantages of BEVs relative to gasoline vehicles are often compensated by the BEV's improved operating cost, acceleration, and fast-charging capabilities, particularly for BEVs with a longer range."⁷⁷ More generally, commenters asserted that “a primary reason the EV market is growing is simply because consumers prefer the new features and technology in EVs.”⁷⁸ Furthermore, “when considering the attributes consumers care about most, ZEVs are a great fit.”⁷⁹ Finally, commenters assert that ZEVs satisfy Californian’s preference for environmental sustainability (*i.e.*, the environmental performance of their vehicle), as well as the demands of California’s

⁷⁵ ZETA, p.7.

⁷⁶ CARB Waiver Request Support Document, p.52.

⁷⁷ Environmental and Public Health Organizations, p.51.

⁷⁸ ZETA, p.7.

⁷⁹ Environmental and Public Health Organizations, p.59.

rural citizens.⁸⁰ Consistent with these comments, CARB has documented the historical increase in ZEV models available for sale in the U.S. and projects continued expansion of vehicle choice under the ACC II regulations.⁸¹ In addition, CARB anticipates continued improvements in ZEV attributes across passenger car and truck categories.⁸²

c. Demand: Complementary Policies, Investments, and Other Programs

Here, we summarize comments related to ZEV policies, programs, and incentives as well as other investments and programs related to ZEVs. Some commenters cast doubt on the effectiveness of interventions and investments in supporting the ZEV market. One commenter stated that “it is no secret that large automakers' BEV programs are losing billions each year despite the massive financial infusion of taxpayer dollars they receive from the government and subsidies to purchase EVs.”⁸³ Another commenter claimed that EV sales continue to drop despite subsidies and purported—without evidence—that most consumers do not want to purchase EVs.⁸⁴ A third commenter highlighted the challenges associated with a misaligned “regulatory regime” rather than a “broad strategy.”⁸⁵ Relatedly, another commenter criticized the slow speed—approximately two years—at which funds from the Bipartisan Infrastructure Law (BIL) flowed into the market.⁸⁶

In contrast, other commenters highlighted programs and investments at the Federal, State, and local levels. Nationally, commenters expect that the passage of the BIL and IRA will significantly spur investment in and demand for ZEVs. For example, a commenter stated that

⁸⁰ *E.g.*, Environmental and Public Health Organizations, p.59; ZETA, p.20.

⁸¹ CARB Waiver Request Support Document, p.52.

⁸² *Id.*, p.50.

⁸³ SEMA, p.3.

⁸⁴ Engineers Labor-Employer Cooperative, EPA-HQ-OAR-2023-0292-0195, p.1.

⁸⁵ NADA, EPA-HQ-OAR-2023-0292-0052, p.2.

⁸⁶ API, p.16.

“passage of the Inflation Reduction Act and other federal actions have already spurred more than \$150 billion domestically in private sector investments in EVs and batteries.”⁸⁷ In California, “consumer incentive programs are well-utilized. ... Every year, [Clean Vehicle Rebate Project] funding runs out due to high demand, with a lengthy waitlist for when more funding becomes available.”⁸⁸ In addition, commenters noted the benefits of California’s Clean Cars 4 All program which provides incentives to help lower-income consumers to replace their old higher-polluting vehicles with cleaner transportation.⁸⁹ One commenter noted that this program provides consumers with incentives such as “home charger incentives or prepaid charge cards [for EV buyers]. Overall, the Clean Cars 4 All program has allocated \$436 million and helped upgrade 13,000 Californian's vehicles to more cleaner options.”⁹⁰ In total, “California has spent well over a decade and billions of dollars developing the infrastructure, providing incentives, and educating consumers about ZEVs.”⁹¹ Citing decades of their “programs,” CARB attested to California’s progress in “improving air quality, combatting climate change, and protecting public health,” and stated that “market demand for clean transportation continues to grow.”⁹²

3. Consumer Impacts and Market Considerations

Commenters’ assessments of the impacts of the ACC II regulations on consumers, negative and positive, vary from the specific to the very general. For example, a commenter asserted that the proposed standards would negatively impact vehicle choice and cost, noting disadvantaged communities in particular.⁹³ Another commenter claimed that the ACC II

⁸⁷ U.S. Climate Alliance, EPA-HQ-OAR-2023-0292-0116, p.2.

⁸⁸ ZETA, EPA-HQ-OAR-2023-0292-0199, p.10.

⁸⁹ <https://ww2.arb.ca.gov/our-work/programs/clean-cars-4-all> (last accessed December 5, 2024)

⁹⁰ ZETA, p.10.

⁹¹ Alliance for Automotive Innovation, EPA-HQ-OAR-2023-0292-0182, p.5.

⁹² CARB Comments by L. Randolph, EPA-HQ-OAR-2023-0292-0045, p.1.

⁹³ Valero, p.6; Consumer choice, affordability, and programs for “disadvantaged” communities are addressed above. Vehicle cost is addressed elsewhere in this document.

regulations will lead consumers “to hold on to their older, dirtier vehicles or buy used vehicles, defeating the intent or purpose of the legislative action.”⁹⁴ In response to comments received that the specific regulations are not necessary (as a factual matter) because they may slow fleet turnover, EPA finds that these commenters have not met their burden of proof to demonstrate that such a result in fleet turnover will occur or that if it did occur, it would cause an increase in emissions compared to CARB’s existing ACC I regulations.⁹⁵

Related to production and distribution, a commenter asserted that “under the ACC II regulations, automakers will be forced to carefully control production” and distribution so that Californians experience the effects of tighter inventories, including higher prices and/or less availability in the marketplace of base model vehicles.⁹⁶ Another commenter highlighted their concerns about automotive aftermarket businesses.⁹⁷ In contrast, other commenters cite growing ZEV sales in the U.S. and conclude that “zero-emission technologies are producing significant economic benefits that can be sustained and accelerated by the ACC II regulations, including the creation of good-paying jobs for American workers. The ACC II regulations will also help satisfy increasing market demand for and expand the market availability of cost-effective ZEVs,

⁹⁴ Transfer Flow, Inc., p.7; As stated earlier in this document, CARB’s Waiver Request Support Document states that the ACC II program includes requirements “to help ensure that consumers can successfully replace their conventional vehicles with new or used ZEVs and PHEVs that both meet their needs for transportation and protect the emission benefits of the program” In addition, as noted earlier in this document, commenters highlighted California’s Clean Cars 4 All program which provides incentives to help lower-income consumers replace their older, higher polluting vehicles with newer, more cleaner options.

⁹⁵ EPA further discusses issues of cost in Section III.C.4.c of the waiver Decision Document.

⁹⁶ New Jersey Coalition of Automotive Retailers (NJ CAR), EPA-HQ-OAR-2023-0292-0161, pp.2-3; In addition to commenting on impacts on Californians, NJ CAR more broadly commented on automakers steering vehicles to CAA section 177 states. Comments related to states other than California are out the scope of the three waiver criteria, including the third waiver criteria of whether CARB’s standards are technologically feasible in terms of the new vehicles required to be introduced into California. Further discussion of “section 177 states” can be found in Section IV.B. of the waiver Decision Document.

⁹⁷ SEMA, p.5.

which will only become more affordable and more accessible as battery prices continue to drop.⁹⁸

Lastly, in speaking to consumer impacts and market considerations, commenters also addressed the availability of and access to charging infrastructure, reliability of the electricity grid, vehicle and battery production capacity, vehicle technology costs, supply chain bottlenecks, and critical minerals.

We acknowledge the positive relationship between access to reliable charging infrastructure and supply-side considerations. These issues, and those noted below have to some extent already been addressed above or EPA otherwise considers them outside the scope of the CAA section 209(b)(1) criteria set out by Congress. Comments specific to charging infrastructure and supply-side considerations, such as critical minerals, electric grid, off-vehicle technology costs, and production capacity, are addressed elsewhere. Furthermore, impacts on consumer choice and demand have been addressed above. Technology feasibility and technology cost considerations have been addressed in Section III.C.4 of the waiver Decision Document. Market considerations such as supplier behavior, aftermarket business, labor markets, and states other than California (*e.g.*, CAA section 177 states), are out of scope. Similarly, comments such as “CARB provides no compelling evidence of a market failure”⁹⁹ and “the market and innovation drive solutions to the environmental challenges”¹⁰⁰ are also out of scope.

4. EPA Response

As explained earlier in Section II.A, consumer issues are not a factor identified in CAA section 209(b), and therefore EPA cannot deny the waiver based on consumer considerations. As

⁹⁸ U.S. Climate Alliance, EPA-HQ-OAR-2023-0292-0116, p.2.

⁹⁹ ACRA, p.18.

¹⁰⁰ SEMA, p.3.

noted above and in EPA’s waiver Decision Document, the scope of EPA’s review under the “consistency with 202(a)” criterion is limited to the considerations related to the regulated party in CARB’s ACC II regulations: the vehicle manufacturers. Therefore, the scope of review is narrowed to whether vehicle emission control technology is available, and if not, can such technology be developed in the lead time provided by CARB upon issuance of its regulation, giving consideration to cost.¹⁰¹ Nonetheless, were EPA to consider consumer issues, EPA believes that CARB’s evaluation of these issues is reasonable and reasonably explained. While some commenters asserted that these various consumer issues will render the ZEV program unachievable or that the ZEV program will have negative impacts on consumers, these commenters have not provided persuasive evidence that this will be the case as the ZEV program is implemented. Supportive commenters attested to the positive impact that ZEVs have on consumers, such as lower operating costs, and have provided data and analysis to support these findings. CARB assessed consumer issues, found that consumer demand is growing, and expressed its confidence that the market will continue to grow to support the levels of ZEVs indicated in the ACC II regulations.¹⁰² CARB noted in its waiver request that although issues such as consumer demand are not relevant to EPA’s consideration of the waiver, the state is pursuing a suite of complementary policies to ensure the market will be able to accommodate the ZEV sales anticipated under the ACC II regulations.¹⁰³ For example, CARB has collaborated with numerous other state agencies and the Governor’s Office of Business and Economic

¹⁰¹ We acknowledge that in some cases there may be overlap between the availability of vehicle technology and certain consumer issues. For instance, if no light-duty vehicle technology is available to meet the standards, then consumer demand for new light-duty vehicles cannot be met. However, that is clearly not the situation here, given the existing vast array of light-duty ZEV and PHEV products and the strong trajectory toward additional product offerings. As we explain in this response and in Section III.C of the waiver Decision Document, we fully expect the basic market demand for light-duty vehicles to be met.

¹⁰² CARB Waiver Request Support Document, p.50.

¹⁰³ *Ibid.*, and CARB ACC II ISOR pp.25-26.

Development to implement a ZEV Market Development Strategy that outlines how the state agencies and stakeholders will work together to reach the state’s ZEV targets. CARB described in detail the significant levels of state funding and investments that support these efforts, as well as public-private partnerships working to increase the ZEV market in California, for example through consumer awareness campaigns and consumer shopping tools.¹⁰⁴ In addition, CARB responded at length to comments regarding consumer issues during its state rulemaking process adopting the ACC II regulations.¹⁰⁵ EPA again notes that while the consumer issues summarized here are not within the scope of our review under CAA section 209(b)(1), we nevertheless have assessed these issues and conclude that, even if it were a criterion relevant to our review, commenters have not met their burden to produce the evidence necessary for EPA to find that the ACC II regulations are not consistent with CAA section 202(a).

B. Grid Reliability

Some commenters noted that high-GHG grids, such as those predominantly using coal, will significantly delay the GHG benefit of plug-in ZEVs.¹⁰⁶ Other commenters expressed concerns about the ability of the electric grid in California to meet the expected demand of BEVs by 2035, although not all of these comments were limited to the situation in California.¹⁰⁷ One of these commenters specifically mentioned “what kind of improvements to electric transmission and distribution infrastructure will be required to serve this increased electricity demand” and who will pay “for these upgrades including the electric vehicle charging infrastructure necessary to serve the additional [sic] of 1.065 million EVs every year reliably and affordably.”¹⁰⁸

¹⁰⁴ CARB ISOR pp.25–26.

¹⁰⁵ CARB Final Statement of Reasons, Appendix E, pp.13-20, 23-24.

¹⁰⁶ Dealership Services Direct, EPA-HQ-OAR-2023-0292-0196, p.3.

¹⁰⁷ CEA, p.2; Transfer Flow, Inc., EPA-HQ-OAR-2023-0292-0132, pp.3, 11; API, p.12; ACRA, p.9.

¹⁰⁸ CEA, p.2.

The Zero Emission Transportation Association (ZETA) noted “[t]he electricity providers in ZETA's membership are actively preparing for the EV transition,” especially since “[e]nergy demand is not constant, but consists of relatively predictable peaks and troughs throughout the day.”¹⁰⁹ ZETA described several case studies from members Pacific Gas and Electric Co. (PG&E) and Southern California Edison (SCE) regarding how they are preparing their grids for future demand.¹¹⁰ PG&E also noted that they already provide “95% greenhouse gas-free electricity to its customers.”¹¹¹ PG&E supports the ACC II ZEV program because it provides market certainty, which puts their investment plan on firmer footing. Other commenters stated, “Empirical data from California—which already has more than 1.8 million ZEVs on the road also supports the readiness of the electrical grid for ZEV penetration rates following the path laid out in ACC II.”¹¹² They continue, “Even in the service territories with the most EVs, the observed costs have been minor. For instance, in California where EV adoption has been markedly higher than other states, EV-related distribution upgrade costs appear minor compared to total distribution costs. Despite the fact EVs are often more concentrated in many neighborhoods and distribution circuits, California utilities collectively spent less than 0.03% of their total distribution-related expenses on distribution system upgrades associated with residential EV adoption.”

In its waiver request, CARB noted “[e]ven if concerns about *California's* electrical grid were relevant to whether the State is entitled to a waiver for its vehicle emission standards (which CARB maintains they are not), any concerns about the *national* grid are irrelevant to

¹⁰⁹ ZETA, EPA-HQ-OAR-2023-0292-0199, p.13.

¹¹⁰ ZETA, EPA-HQ-OAR-2023-0292-0199, pp.38-45.

¹¹¹ Pacific Gas and Electric Co. (PG&E), EPA-HQ-OAR-2023-0292-0167, p.2.

¹¹² Environmental and Public Health Organizations, p.17.

whether California is entitled to a waiver and therefore outside the scope of EPA's waiver evaluation. Nevertheless, CARB addressed these issues in its rulemaking.”¹¹³

CARB has demonstrated that electric power sector resource adequacy, reliability, and resiliency have been adequately addressed for the anticipated impacts of the ACC II regulations. Within the ACC II FSOR, Appendix A, CARB stated that California’s electric grid will be capable of meeting additional demand from ACC II and that this is supported by the data and studies cited within the CARB Response to Comments on the Draft Environmental Analysis (RtC-DEA).¹¹⁴

CARB estimated that the ACC II regulations will result in approximately 12 million BEVs being registered in California by 2035.¹¹⁵ The Pacific Northwest National Laboratory (PNNL) study referenced by CARB found sufficient electric power sector resource adequacy to support 24 million LDV, 200,000 MDV, and 150,000 HDV BEVs by 2028, far exceeding CARB’s estimated BEV share due to the ACC II regulations.¹¹⁶ In addition, the PNNL study found that resource adequacy can be further doubled via managed charging.¹¹⁷ The findings regarding managed charging were similar to results of the recent U.S. Department of Energy

¹¹³ CARB Public Hearing Response, p.10.

¹¹⁴ California Air Resources Board, “Final Statement of Reasons for Rulemaking, Including Summary of Comments and Agency Response, Appendix A – Summary of Comments to the Overall Advanced Clean Cars II Regulations and Agency Responses.” Agenda Item No.: 22-10-1, August 25, 2022.

<https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/accii/fsorappa.pdf> (last accessed December 5, 2024)

¹¹⁵ California Air Resources Board. Master Response 1 – Response to Comments on the Draft Environmental Analysis – Prepared for the Advanced Clean Cars II Program. August 24, 2022.

<https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/accii/acciiirtc1.pdf> (last accessed December 5, 2024)

¹¹⁶ Kintner-Meyer, Michael, S. Davis, S. Sridhar, D. Bhatnagar, S. Majumder, and M. Ghosal. 2020. Electric Vehicles at Scale – Phase I Analysis: High EV Adoption Impacts on the Western U.S. Power Grid. Pacific Northwest National Laboratory. July. https://www.pnnl.gov/sites/default/files/media/file/EV-AT-SCALE_1_IMPACTS_final.pdf (last accessed December 5, 2024)

¹¹⁷ *Ibid.*

(DOE) Transportation Electrification Impact Study cited by EPA within analyses supporting the LMDV Multipollutant Rule.¹¹⁸

CARB cited studies showing that the necessary build-out of additional generation capacity would be more gradual than previous electricity sector growth in California and that the additional capacity could be achieved primarily through building increased renewable generation.¹¹⁹ In addition, CARB provided specific examples of policies developed by the California Energy Commission (CEC), the California Independent System Operator (CAISO) and specific utility investments approved by the California Public Utilities Commission (CPUC) that optimize grid resources, maintain grid reliability, and provide reasonable rates for residential electric vehicle charging as the ACC II regulations are implemented.¹²⁰ CARB also cited CPUC

¹¹⁸ National Renewable Energy Laboratory, Lawrence Berkeley National Laboratory, Kevala Inc., and U.S. Department of Energy. *Multi-State Transportation Electrification Impact Study: Preparing the Grid for Light-, Medium-, and Heavy-Duty Electric Vehicles*. DOE/EE-2818, U.S. Department of Energy, 2024. [https://www.energy.gov/sites/default/files/2024-03/2024.03.18 NREL LBNL Kevala DOE Multi-State Transportation Electrification Impact Study FINAL DOCKET.pdf](https://www.energy.gov/sites/default/files/2024-03/2024.03.18%20NREL%20LBNL%20Kevala%20DOE%20Multi-State%20Transportation%20Electrification%20Impact%20Study%20FINAL%20DOCKET.pdf) (last accessed December 5, 2024); EPA. *Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles - Regulatory Impact Analysis*. Chapter 5.4 – Grid Reliability. Document No. EPA-420-R-24-004. March 2024. <https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P1019VPM.pdf>. (last accessed December 5, 2024)

¹¹⁹ U.S. DRIVE. 2019. Summary Report on EVs at Scale and the U.S. Electric Power System. U.S. Driving Research and Innovation for Vehicle Efficiency and Energy Sustainability (DRIVE). November 2019. <https://www.energy.gov/sites/prod/files/2019/12/f69/GITT%20ISATT%20EVs%20at%20Scale%20Grid%20Summary%20Report%20FINAL%20Nov2019.pdf> (last accessed December 5, 2024); Matteo Muratori, *et al.*, 2021. “The rise of electric vehicles—2020 status and future expectations.” *Prog. Energy* 3, 022002. March 25. <https://iopscience.iop.org/article/10.1088/2516-1083/abe0ad/meta> (last accessed December 5, 2024); Abhyankar, Nikit, Umed Paliwal, Taylor McNair, David Wooley, Michael O'Boyle, and Amol Phadke. 2021. Powering America's Clean Economy: A Supplemental Analysis of the 2035 Report. University of California, Berkeley Goldman School of Public Policy. <https://energyinnovation.org/wp-content/uploads/2021/04/2030-Report-FINAL.pdf> (last accessed December 5, 2024).

¹²⁰ California Energy Commission. Draft Zero-Emission Vehicle Infrastructure Plan (ZIP). Publication Number: CEC-600- 2022-054. April 2022. <https://www.energy.ca.gov/sites/default/files/2022-12/600-2022-054-REV.pdf> (last accessed December 5, 2024); California Independent System Operator. 20-year Transmission Outlook: CA ISO's 20-Year Outlook. January 31, 2022. <http://www.caiso.com/InitiativeDocuments/20-YearTransmissionOutlook-May2022.pdf> (last accessed December 5, 2024); California Public Utilities Commission. Order Instituting Rulemaking to Continue Electric Integrated Resource Planning and Related Procurement Processes. May 14, 2020. <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M337/K641/337641522.pdf> (last accessed December 5, 2024); California Public Utilities Commission. Decision Adopting 2021 Preferred System Plan. Rulemaking 20-05-003. December 22, 2021.

policies to mitigate the impacts of public safety power shutoff (PSPS) events on vehicle charging, including the potential for using microgrid deployment, grid-independent EV charging stations, backup electricity generation and use of grid battery storage.¹²¹

As explained above, grid reliability is not a vehicle technology nor is it a factor identified in CAA section 202(a), as referenced in the third waiver criterion, and therefore EPA cannot deny the waiver based on grid reliability considerations, nor have commenters set forth a rubric by which to measure such reliability. Nonetheless, even were EPA to consider grid reliability, EPA believes that CARB's evaluation of this issue is reasonable and reasonably explained. In EPA's judgment, CARB carefully considered the increased electricity demand potentially resulting from its program, the resources necessary to meet that demand, and the impacts of meeting that demand across the electricity sector, including specifically on grid reliability. Moreover, CARB and supporting commenters identified corroborating evidence from organizations with expertise in and responsibility for the electric grid in California, including PG&E, SCE, CEC, CAISO, and CPUC, including relevant data, analysis, and policies. CARB's analysis, moreover, is consistent with recent analysis from Federal agencies with relevant expertise, including EPA, PNNL, and DOE. By contrast, opponents to the waiver failed to adduce any concrete data or analysis regarding the impacts of the ACC II regulations in California, but instead generally relied on national-level assertions and speculative assertions and fears about what might possibly happen in the future. Particularly in light of the robust showing

<https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M449/K173/449173804.pdf> (last accessed December 5, 2024); California Independent System Operator. 2022-2023 Transmission Planning Process Unified Planning Assumptions and Study Plan. June 30, 2022. <http://www.caiso.com/InitiativeDocuments/FinalStudyPlan-2022-2023TransmissionPlanningProcess.pdf> (last accessed December 5, 2024).

¹²¹ California Public Utilities Commission. Decision 20-06-017: Decision Adopting Short-Term Actions to Accelerate Microgrid Deployment and Related Resiliency Solutions. June 17, 2020. <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M340/K748/340748922.pdf> (last accessed December 5, 2024).

provided by the State and supporting commenters, the opponents’ assertions fail to demonstrate that grid reliability issues—to the extent they are relevant at all—create inconsistency with CAA section 202(a).

C. Charging Infrastructure

Comments regarding charging infrastructure encompassed a few topics, including the availability and accessibility of charging, the reliability of charging, and the quality of the charging experience. We summarize these comments below, and then provide a response which includes information submitted by CARB related to charging infrastructure.

Comments related to availability and accessibility of charging addressed the number of charging stations and ports, distribution of and access to charging, and investments in and construction of charging infrastructure. In addition, comments addressed both public and private charging. Regarding public charging, commenters discussed the growing demand for public charging and the pace at which investments yield charging infrastructure. Commenters also addressed access to chargers, including their views on either the feasibility or infeasibility of at-home charging for different households, with some commenters highlighting affordability and equity. For example, some commenters expressed concerns regarding availability and accessibility of charging, which one commenter summed up as follows: “Every discussion I have with consumers centers around three concerns: refueling limitations, the availability of charging points, and affordability.”¹²²

Regarding demand for charging, a commenter stated that “public charging networks remain unable to keep up with charging demand.”¹²³ Similarly, citing Edison Electric Institute’s

¹²² NADA, EPA-HQ-OAR-2023-0292-0052, p.2.

¹²³ Alliance for Automotive Innovation, EPA-HQ-OAR-2023-0292-0182, p.4.

conclusion that a charging infrastructure gap will result despite significant planned investments, another commenter stated that “California’s petition does not adequately address the impact of the proposed waiver on public charging demand.”¹²⁴ Similarly, “the Alliance for Automotive Innovation has also found that an infrastructure gap exists, stating that ‘nearly 1.1 million more public chargers . . . will need to be installed to satisfy the necessary infrastructure estimate. This means between the end of the third quarter 2023 and December 31, 2030, 414 chargers need to be installed every day, for the next 7.2 years.’”¹²⁵ They continued, concluding that “the pace of investment in charging infrastructure is woefully inadequate to support the demand required to meet the ACC II mandates.”¹²⁶ This sentiment was echoed by the another commenter, stating that “CARB does not explain how California can possibly achieve this massive expansion.”¹²⁷ Relatedly, a commenter asserted “there is significant uncertainty regarding the technology and infrastructure readiness needed to support the ACC II regulations within the stated timeframe,” also claiming charging infrastructure funded by the Bipartisan Infrastructure Law is slow to be realized.¹²⁸ Another commenter suggested that “spending hundreds of billions of dollars to install non-existent EV infrastructure and offer subsidies to incentivize consumers to abandon cost-efficient ICE vehicles” makes little sense given that “ICE infrastructure is already in place.”¹²⁹

Regarding the construction and build out of charging infrastructure, one commenter noted that its “members are . . . experiencing firsthand how challenging it is to plan and build out

¹²⁴ NADA, p.6.

¹²⁵ *Id.*, p.6.

¹²⁶ *Id.*, p.4.

¹²⁷ ACRA, p.11.

¹²⁸ API, p.15.

¹²⁹ SEMA, p.5.

sufficient charging capacity.”¹³⁰ According to another commenter, households also face challenges regarding charging. While home charging is feasible for many households, “many [others] do not have garages for home charging or easy access to public charging stations.”¹³¹ Relatedly, a commenter stated that “[m]ost current EV buyers are affluent single-family homeowners who can both afford the higher up-front purchase cost of EVs and have ready access to reliable, low-cost, and convenient home charging. Affluent single-family homeowners might make up most new car buyers, but the transition to 100 percent ZEVs in ACC II requires not just ‘most new car buyers’ but ‘all new car buyers.’”¹³² Contrasting wealthier home owners with lower income renters, another commenter asked the EPA “to address the systemic inequity and energy injustice issues embedded in this waiver request that are beyond the financial burden that will be caused.”¹³³ They also stated that “the location of charging infrastructure tends to benefit the wealthier, whiter, male demographic” and that “white-majority census block groups were 1.5 times more likely to have access to public charging stations compared to Black- and Latino-majority census block groups.”¹³⁴

A few comments were received regarding the reliability of chargers and the quality of the charging experience. For example, a commenter stated that “long lines, complaints of unreliable stations, and too few stations throughout California and other states are very real concerns for current and prospective ZEV owners.”¹³⁵ Similarly, another commenter asserted, based on a

¹³⁰ ACRA, p.11.

¹³¹ Valero, p.6 of the attachment.

¹³² Alliance for Automotive Innovation, EPA-HQ-OAR-2023-0292-0182, p.4.

¹³³ CEA, p.3.

¹³⁴ *Id.*, p.3.

¹³⁵ Alliance for Automotive Innovation, EPA-HQ-OAR-2023-0292-0182, p.4.

Wall Street Journal article, that “up to 40% of the public chargers may be inoperable at any given time.”¹³⁶

In contrast, many commenters expressed confidence that the charging infrastructure in California will continue to scale up on a pace necessary to support the ACC II regulations. A commenter stated that “infrastructure buildout in California and nationwide is occurring and will accelerate.”¹³⁷ They also stated, “Empirical data from California shows that the State's charging network is robust and growing, and that the electric grid will be able to handle ACC II's requirements.”¹³⁸ Furthermore, “the buildout of charging and grid infrastructure can occur at the pace and scale needed to support expanded vehicle electrification, and any arguments to the contrary are unreasonably pessimistic and inconsistent with both economic theory and historical precedent.”¹³⁹ Similarly, another commenter stated that “industry is continuing to rapidly build out EV charging capacity both as a result of private investment and with support from billions of dollars in federal funding.”¹⁴⁰

Referencing charging infrastructure deployment supported by BIL and IRA programs, a commenter stated, “Complementary policies that encourage vehicle manufacturers to transition to EVs sends market signals to the charging industry that provide the certainty needed to make proactive infrastructure and manufacturing investments.”¹⁴¹ According to another commenter, complementary policies include “offering state-level incentives that can be combined with federal tax credits for the purchase and installation of electric vehicle (EV) chargers, leveraging

¹³⁶ ACRA, p.11.

¹³⁷ Environmental and Public Health Organizations, p.3.

¹³⁸ *Id.* p.35.

¹³⁹ *Id.* p.46.

¹⁴⁰ ZETA, p.46.

¹⁴¹ *Id.* p.46.

investments through the National Electric Vehicle Infrastructure [NEVI] program to expand public charging availability, working with utilities to expand investments in ZEV infrastructure..., and establishing EV-ready requirements to ensure new housing and parking facilities will accommodate EV charging infrastructure.”¹⁴² In addition, a commenter cited Atlas Public Policy’s estimate that \$67 billion dollars in charging infrastructure investments had been announced by the public, private, and utility sectors.¹⁴³ Furthermore, “analyses commissioned by NRDC [the Natural Resources Defense Council] and performed by Atlas Public Policy and Dean Taylor Consulting found that there is sufficient funding available to support the charging infrastructure needed in California over the next five years ... With the regulatory certainty provided by ACC II, investment is expected to continue to increase.”¹⁴⁴ Relatedly, this commenter noted that “California's previous standards have already sent a strong signal to the market to undertake the infrastructure investments needed to accommodate a gradual rise in vehicle electrification.”¹⁴⁵ Furthermore, “[a]n influential study by Li *et al.* (2017), which included data from California, found that ‘EV demand and charging station deployment give rise to feedback loops’ and that ‘subsidizing either side of the market will result in an increase in both EV sales and charging stations.’”¹⁴⁶

Regarding access to public and private charging, a commenter stated that “the majority of charging needs will be ultimately met through at-home or near-home charging” but also “a robust public charging network” is required, “which the sector is already deploying.”¹⁴⁷

¹⁴² U.S. Climate Alliance, EPA-HQ-OAR-2023-0292-0116, p.1.

¹⁴³ Environmental and Public Health Organizations, p.35.

¹⁴⁴ *Id.*, p.37.

¹⁴⁵ *Id.*, p.46.

¹⁴⁶ *Id.*, p.47.

¹⁴⁷ ZETA, p.45.

Specifically, the Inflation Reduction Act Section 30C Alternative Fuel Vehicle Refueling Property Tax Credit targets “investments toward non-urban and lower-income residents, [incentivizing] individuals and commercial operators to install charging stations at their homes and in publicly-accessible locations. Retailers, local businesses, and commercial fleet operators can utilize the credit to offset the costs of installing charging infrastructure on their property, enabling them to attract and retain customers.”¹⁴⁸ Noting federal, state, and industry charging investments and deployment efforts, this commenter further highlighted specific efforts to “[recognize] the diverse demographics, landscapes, and types of communities throughout the United States,” to bring “ubiquity and visibility... to national EVSE network deployment”, and to “put together separate toolkits to guide EVSE deployment in both urban and rural areas.”¹⁴⁹ This includes multiple efforts underway to help EV drivers locate and access charging infrastructure.”¹⁵⁰ Taken together, these efforts “will lead to significant buildout of EV charging in communities, at homes and businesses, and along high-traffic highway corridors.”¹⁵¹

On the topics of charging reliability and the quality of the charging experience, one commenter noted that “drivers are interested in how quickly they can refuel their vehicles” and highlighted that “ZEVs have real advantages that should not be underestimated.”¹⁵² For example, “drivers with access to a garage or dedicated overnight parking spot may simply charge at home.”¹⁵³ ZEVs also “have the meaningful advantage of refueling at a far wider array of locations than gasoline stations.”¹⁵⁴ In addition, with increasing numbers of chargers available in

¹⁴⁸ ZETA, p.48.

¹⁴⁹ *Id.*, p.47.

¹⁵⁰ *Id.*, p.48.

¹⁵¹ *Id.*, p.48.

¹⁵² Environmental and Public Health Organizations, p.64.

¹⁵³ *Id.*, p.64.

¹⁵⁴ *Id.*, p.65.

places where drivers otherwise spend their time, “drivers can simply plug in and charge at a variety of locations where they would naturally park their vehicle for long periods of time.”¹⁵⁵ Further, this commenter stated that “most [vehicle] trips are well below the average ZEV range,” and “recent research has shown that 90% of U.S. vehicle trips could be completed in vehicles with ... range well below the capabilities of the current average [ZEVs].”¹⁵⁶

As discussed above in this section, it is important to note again that the charging issues summarized here are not within the scope of EPA’s waiver review under CAA section 209(b)(1). Nevertheless, if these issues were relevant to our review, EPA finds that commenters have not persuasively argued that charging infrastructure will be an impediment to compliance with the ZEV regulations.

In considering the comments on charging infrastructure, we have assessed the technical record that CARB has developed in support of the ACC II waiver request. In its adoption of the ACC II regulations, CARB maintained that ZEV infrastructure issues were outside the scope of its state rulemaking and impacts assessment; nevertheless, CARB documented at length the comprehensive set of complementary policies, including charging infrastructure development, that many California agencies are committed to implementing to ensure a successful ZEV market.¹⁵⁷ CARB discussed the many public and private investments and other actions being taken to accelerate charging infrastructure in California,¹⁵⁸ and that it coordinates with CEC and CPUC, which have the primary roles in implementing programs and investments to build out the state’s infrastructure network. For example, CEC is the state agency responsible for assessing

¹⁵⁵ Environmental and Public Health Organizations, p.65.

¹⁵⁶ Environmental and Public Health Organizations, p.64.

¹⁵⁷ CARB ACC II Initial Statement of Reasons, p.24.

¹⁵⁸ *Ibid.* pp.26–30.

charging infrastructure needs in California and tracking progress on planned public investments to ensure that the state's charging infrastructure goals are met. CARB discussed the many sources of public investments supporting charging infrastructure deployment, including state funding, the Bipartisan Infrastructure Law, and Electrify America's commitment to infrastructure funding in California. CARB stated that large private investments are also being made by charging providers and automakers, which will contribute to meeting the state's charging infrastructure goals. CARB expected that private investments will continue to grow with ZEV demand and points out that the ZEV regulation provides further incentive to both private and public entities to further develop the necessary charging infrastructure. CARB also provided detailed responses to comments received during its state rulemaking process on the availability of charging infrastructure.¹⁵⁹ In addition, CARB noted the "continued expansion of California's charging and hydrogen fueling network as a driver of the growing number of ZEV and PHEV models."¹⁶⁰ CARB concluded that "the State investments and programs currently underway are expected to make strong contributions towards addressing infrastructure growth for ZEV drivers in a manner that complements private investments and works to ensure convenient charging access for all California drivers."¹⁶¹

As explained above, charging infrastructure is not a vehicle emission control technology nor is it a factor identified in CAA section 209(b)(1), and therefore EPA cannot deny the waiver based on charging considerations. Nonetheless, even were EPA to consider charging availability, EPA believes that CARB's evaluation of this issue is reasonable and reasonably explained. In EPA's judgment, CARB carefully considered the increased demand for charging infrastructure

¹⁵⁹ CARB Initial Statement of Reasons, Appendix E, p.20.

¹⁶⁰ CARB Waiver Request Support Document, pp.49-50.

¹⁶¹ *Ibid.* p.30.

needed under the ACC II regulations and the resources necessary to meet that demand over time. Since the time of CARB’s state rulemaking, when it conducted its assessment of charging infrastructure development in the state, California has further increased its investment in the accelerated deployment of ZEV infrastructure.¹⁶² Moreover, CARB and supporting commenters identified corroborating evidence from organizations with expertise in and responsibility for charging infrastructure development in California, including CEC and CPUC, and included relevant data and analysis to support their findings. Furthermore, CARB’s assessment is consistent with recent analysis from Federal agencies with relevant expertise, including EPA,¹⁶³ DOE, the Joint Office for Energy and Transportation, and National Laboratories,¹⁶⁴ which have found that, given the significant and accelerated public and private investments occurring, charging infrastructure development is progressing on a pace to meet the needs of anticipated ZEV demand. By contrast, opponents to the waiver failed to adduce any concrete data or analysis regarding how charging infrastructure in California would be insufficient to support the ACC II regulations, but instead generally relied on speculative assertions about what might possibly happen in the future. In light of the robust showing provided by the State and supporting commenters, the opponents’ assertions fail to demonstrate that charging availability issues—to the extent they are relevant at all—create inconsistency with CAA section 202(a).

D. Costs Other than Vehicle Technology Costs

¹⁶² California Energy Commission, “CEC Approves \$1.9 Billion Plan to Expand Zero-Emission Transportation Infrastructure, February 14, 2024. Accessed August 6, 2024, at: <https://www.energy.ca.gov/news/2024-02/cec-approves-19-billion-plan-expand-zero-emission-transportation-infrastructure> (last accessed December 5, 2024).

¹⁶³ 89 FR 28013, April 18, 2024.

¹⁶⁴ Wood *et al.* “The 2030 National Charging Network: Estimating U.S. Light-Duty Demand for Electric Vehicle Infrastructure,” 2023. <https://driveelectric.gov/files/2030-charging-network.pdf> (last accessed August 6, 2024). See *e.g.*, p.viii, “Public and private investments in publicly accessible charging infrastructure have accelerated in recent years. If sustained with long-term market certainty grounded in accelerating consumer demand, these public and private investments will put the United States on a path to meeting the infrastructure needs simulated in this report.”

Several commenters raised concerns on aspects of cost that are not vehicle technology costs. EPA acknowledges and responds to these comments in this section, even though they are not within the scope of EPA’s evaluation of the waiver request.

Commenters noted wide availability of ZEVs available today in all light- and medium-duty vehicle classes, many offering a favorable total cost of ownership and at a wide range of price points; further, commenters have noted that ZEV prices are decreasing and are expected to continue decreasing to attain cost and/or price parity with many similar ICEVs within the general time frame of the ACC II regulations, especially when considering the effect of the IRC 30D clean vehicle credit and IRC 45W clean commercial vehicle tax credits for eligible vehicles.¹⁶⁵

One commenter stated that “CARB did not give ‘appropriate consideration’ to the costs of ACC II’s ZEV rule, stating that CARB “underestimated some costs and ignored others that will predictably result from the rule,” and “failed to reasonably weigh the rule’s costs against its benefits.” The commenter also asserted that fiscal year losses reported by automakers for their electric car operations “already exceed the costs CARB expects for the industry as a whole.”¹⁶⁶ EPA disagrees that CARB did not give appropriate consideration to costs. In a manner consistent with the consideration of cost under CAA section 202(a), CARB performed an estimate of costs to manufacturers. The commenter instead has cited other aspects of cost, stating the position that ZEVs have increased maintenance and repair costs and a higher purchase cost, that subsidies will not be sufficient, and that CARB did not account for infrastructure costs or higher electricity costs in California and in CAA section 177 states. The commenter also alleged that if CARB had considered such factors, the cost would be too high and would outweigh the benefits. However,

¹⁶⁵ ZETA, pp.10–12; Environmental and Public Health Organizations, pp.61-62; ICCT, p.2.

¹⁶⁶ ACRA, p.14.

as explained previously, commenter's assertions as to higher purchase cost, maintenance and repair costs, sufficiency of subsidies or lack thereof, infrastructure costs, and higher electricity costs are not questions of vehicle technology cost to manufacturers and so are not germane to EPA's evaluation of the waiver in the context of CAA section 202(a). Fiscal year losses reported by manufacturers and attributed to ZEV technology research and development are not directly comparable to the cumulative industry costs estimated by CARB, nor are they indicative of per-vehicle costs for ZEV technology over the long term. Commenter's examples of manufacturer losses per vehicle are not credible because they are based on large capital and research investments being amortized over a short period of initial production, which is not a standard accounting practice for assessing the profitability of a vehicle line. Also, as explained above, a cost-benefit analysis is not a requirement in assessing consistency with CAA section 202(a).

A commenter stated that "consumer cost impacts may not be adequately addressed by CARB," pointing to a study on levelized cost of driving (LCOD) that indicated that some ICEVs and hybrid electric vehicles (HEVs) have a lower LCOD than a 400-mile BEV.¹⁶⁷ Again, EPA notes that consumer costs are not within the scope of this review. EPA also notes that the cost analysis provided by CARB in support of its waiver request includes consideration of costs associated with ICEVs and HEVs as well as a number of ZEV configurations. The commenter's reference to an LCOD metric is not directly comparable to the per-vehicle manufacturer costs estimated by CARB. Further, it is not unexpected that the 400-mile BEV cited by the commenter, which has a particularly long driving range and larger battery compared to many ZEVs on the market today and in CARB's analysis, might have a relatively high initial cost. The commenter has not shown that the cited information invalidates CARB's per-vehicle

¹⁶⁷ API, p.16.

manufacturer cost estimate which pertains to a fleet consisting of a variety of ZEV and non-ZEV vehicles.

Some commenters alleged that EVs have higher maintenance and repair costs than ICEVs.¹⁶⁸ In support of this position, one commenter asserted a connection to auto rental firm Hertz recently choosing to reduce its fleet of EVs.¹⁶⁹ In contrast, supportive commenters often cited operational cost savings and lower maintenance and repair costs for ZEVs.¹⁷⁰ As explained previously, consumer costs are not within the scope of this review. EPA also notes that the commenter's assertion—that Hertz's decision to reduce its EV fleet was the result of higher maintenance and repair costs—conflicts with press reports and company statements. These reports indicate a number of factors contributed to Hertz's decision, many of which are unrelated to repair and maintenance cost, such as Tesla's decision to reduce its new vehicle prices.¹⁷¹ Even if the Hertz decision had been based solely on maintenance and repair costs, the commenter did not indicate how this observation would quantitatively impact the validity of CARB's estimates of the cost of ZEV control technology to manufacturers.

Another commenter stated that vehicle-to-grid (V2G) savings that were assessed by CARB are too speculative to include.¹⁷² Again, to the degree that V2G savings impact consumer cost and not cost to the manufacturer, this topic is not within the scope of EPA's review. Nonetheless, EPA is aware of the potential for V2G to improve the integration of ZEVs with the grid, manage electricity demand, and provide income to consumers who choose to participate in

¹⁶⁸ Valero, p.17; ACRA, p.15; Illinois Corn Growers Association, *et al.* EPA-HQ-OAR-2023-0292-0185, p.14.

¹⁶⁹ Valero, p.17.

¹⁷⁰ Aspen One, *et al.*, p.1; Environmental and Public Health Organizations, p.63; ZETA, p.21.

¹⁷¹ For example, see Ewing, J., "Hertz Will Shrink Electric Fleet After Being Burned by Tesla's Price Cuts," *The New York Times*, January 11, 2024.

¹⁷² ACRA, pp.17–18.

V2G programs. The commenter provided no persuasive evidence to show that it is unreasonable for CARB to expect that V2G technology has these advantages and is a relevant consideration in a cost analysis that covers the timeframe of the program. While the precise degree of potential income from V2G may be uncertain, the commenter did not establish that it is more appropriate to assign no benefit at all than to assign a reasonable estimate, nor that CARB's estimate is unreasonable.

Several additional commenters focused on categories of costs which are not vehicle technology costs. A commenter argued that CARB did not “adequately address the costs associated with infrastructure development or the procurement of raw materials.”¹⁷³ Two commenters cited the possibility of decreased tax revenue in California and/or CAA section 177 states resulting from a decrease in gasoline sales.¹⁷⁴ Another commenter stated that CARB did not give appropriate consideration to a number of cost topics including increased price of new vehicles, cost of grid and charging infrastructure, impacts on low-income and disadvantaged communities, costs to the in-state fossil fuel industry, cost of abatement of polluting industries that choose to move out of state, increased risk of wildfire, and cost of compensation for loss of property use and investment-backed expectations that they characterize as regulatory taking.¹⁷⁵

EPA notes again that these costs are not germane to the issue of EPA's consideration of the waiver request as they are not within the scope of the costs that must be considered under CAA section 202(a). Specifically, although the Administrator has the discretion to consider a variety of cost impacts, CAA section 202(a) (and accordingly CARB's per-vehicle cost

¹⁷³ Texas Public Policy Foundation (TPPF), EPA-HQ-OAR-2023-0292-0058, p.5.

¹⁷⁴ API, p.16.; ACRA p.17.

¹⁷⁵ American Fuel & Petrochemical Manufacturers (AFPM), EPA-HQ-OAR-2023-0292-0226, p.22. EPA notes that this issue is addressed in Section IV.E of the waiver Decision Document.

estimates) concerns the cost imposed on regulated parties, such as auto manufacturers, and not non-regulated parties such as tax collection authorities, state legislatures, the fossil fuel industry, electric grid operators, charging infrastructure providers, or members of specific communities. In addition, even if these cost topics were germane, commenters have largely not provided quantification of such costs, nor shown that inclusion of these costs, to the extent such costs may or may not result from the program, would render CARB's cost estimates invalid or inconsistent with CAA section 202(a). Regarding effects of potentially decreased tax revenue from gasoline sales, EPA notes that the first commenter also acknowledged that CARB, in its waiver request, had analyzed and considered the potential impacts on employment and reduced government spending resulting from reduced tax.¹⁷⁶

A commenter cited higher purchase costs of EVs and stated the position that such higher costs would continue in years to come, in part because of its contention that manufacturers are partnering with Chinese suppliers that would render their production ineligible for subsidies.¹⁷⁷ However, EPA notes that although manufacturers are free to partner with suppliers that reduce or eliminate their IRA tax credit eligibility if they see an advantage in doing so, there is little evidence that manufacturers are commonly doing so given the significant value of the credits. Indeed, economic theory indicates that manufacturers would rationally act to maximize the value of the tax credits they can obtain. Moreover, manufacturers have broadly demonstrated responsiveness to the availability of the credits by publicly announcing investments in new or upgraded U.S. facilities and moving to source materials from North America to take advantage

¹⁷⁶ API, p.17.

¹⁷⁷ Valero, p.16.

of IRC 30D and 45X, as well as increasing the availability of leasing in order to take advantage of IRC 45W.¹⁷⁸

The same commenter also disputed the comparability of the used ZEV market to the used ICEV market, citing for example lower used ZEV values and fear of battery replacement cost, which commenter contends will cause ZEVs to be less attractive to buyers particularly on the used vehicle market.¹⁷⁹ However, the commenter has not established that the need for battery replacement in light-duty vehicles will be a common occurrence, nor that a fear of such an event or of lower resale values will persist, as consumers gain more experience with ZEVs. The commenter also has not considered that many factors are likely to contribute to current lower resale prices of ZEVs, including transitory factors such as the degree of average consumer experience with ZEVs and the dynamic state of the ZEV industry in which technology is advancing rapidly and price competition is affecting new vehicle prices. The commenter has not provided data or evidence to support the belief that these factors will continue to be an issue over the course of the ACC II regulations.

E. Other Comments

One commenter alleged that CARB failed to consider alternative lower-emission LEV fleet options that the commenter felt would have a lower cost or better feasibility.¹⁸⁰ However, EPA notes that it is not within the scope of EPA's evaluation of the waiver request to consider alternative designs for the ACC II regulations. EPA's evaluation of the waiver request considers the specific stringency levels and program design decisions CARB has made and evaluates them in the context of the three prongs. The question of whether or not CARB could have selected an

¹⁷⁸ 89 FR 27852, April 18, 2024.

¹⁷⁹ Valero, p.16.

¹⁸⁰ AFPM, EPA-HQ-OAR-2023-0292-0226, p.23.

alternative policy design or level of stringency is not relevant to EPA's waiver decision. EPA additionally notes that CARB did in fact consider several alternatives in the development of its ACC II regulations. For example, CARB notes in its supplemental comments that it “considered and rejected a low-carbon fuel alternative,” and “analyzed alternatives with less stringent ZEV sales requirements and an alternative with no LEV regulation updates.”¹⁸¹

Some commenters discussed issues concerning the CAA section 177 states’ adoption of the California ZEV program. One commenter expressed concerns about the feasibility of meeting the ZEV standards in section 177 states that adopt the CARB program, including concerns that section 177 states lack the level of supportive policies and incentives that exist in California to support the ZEV market, that charging infrastructure will be insufficient, and that the ZEV market will not develop on a pace necessary to meet the ZEV standards.¹⁸² Another commenter discussed the potential for “market distortions” which it believed could occur if auto manufacturers allocate EVs primarily to section 177 states, while restricting EV supply in non-section 177 states where there may be more consumer demand.¹⁸³ Another commenter mentioned section 177 states in making an argument that the ACC II regulations would reduce renewable fuel consumption “across a vast swathe of the United States.”¹⁸⁴ In response, EPA notes that consideration of the applicability of ACC II regulations in section 177 states is beyond the scope of the EPA waiver review process. We further explain this in Section IV.B of the waiver Decision Document.

¹⁸¹ California Supplemental Comments, p.20.

¹⁸² Alliance of Automobile Manufacturers, EPA-HQ-OAR-2023-0292-0182, p.2.

¹⁸³ NADA, pp.3-4.

¹⁸⁴ Illinois Corn Growers Association, *et al.* EPA-HQ-OAR-2023-0292-0185, p.36.

A commenter also raised the potential for a mismatch between the ACC II ZEV standards and the Energy Independence and Security Act of 2007 (EISA) Renewable Fuel Standards (RFS) requirement to increase renewable fuels content, stating the view that increasing numbers of ZEVs in California and CAA section 177 states would amount to a reduction in renewable fuel use, demand for which the commenter believes could not be compensated by demand from other industries, and which the commenter believes would be against Congress’ intent to “increase” production of renewable fuels.¹⁸⁵ As discussed further in Section IV.E of the EPA’s waiver Decision Document, nothing in CAA section 209(b) requires EPA to consider consistency with the RFS program in deciding whether to grant a waiver. EPA therefore does not consider this comment to be germane to the waiver proceeding. Moreover, EPA’s most recent RFS rule mandated increasing nationally applicable volumes of renewable fuels.¹⁸⁶

Another commenter expressed concern about the ZEV program’s impacts on the petroleum industry, stating that the standard of 100 percent new light-duty vehicle ZEV sales by MY 2035 “necessitates the complete electrification of the transportation sector, and also forcing the phase-out of oil and gas production and refinery industries.”¹⁸⁷ However, EPA notes that the waiver is not concerned with a national ZEV program but a California program, and even were the California program to result in 100 percent ZEVs in California, this would not constitute “complete electrification of the transportation sector” nor would it force the “phase-out of oil and gas production and refinery industries,” as the program would not apply to the majority of the U.S. Even considering adoption of the ZEV program by CAA section 177 states—again, not within the waiver consideration scope—the remainder of the U.S. would remain under the

¹⁸⁵ Illinois Corn Growers Association, *et al.*, p.36.

¹⁸⁶ 88 FR 44468 (July 12, 2023).

¹⁸⁷ AFPM, p.10.

federal program, which does not mandate ZEVs. Although less oil and gas production might be needed to supply California vehicles, the oil and gas production and refinery industries within California and elsewhere would continue to be able to operate and provide products for use elsewhere in the U.S. and overseas. Further, the sales target of 100 percent ZEVs can include up to 20 percent PHEVs, which continue to use oil and gas products. Also, the ZEV program applies to sales of new vehicles; the on-road fleet would turn over only gradually as vehicles age out of the fleet, meaning that significant demand for oil and gas would continue even after 2035.

Another commenter asserted that approving the waiver would cause manufacturers to build a single national fleet that meets stricter California standards, which in the commenter's view would mean that "the vehicles available to Ohioans are not governed by Ohio's standards or the Federal government's standards, but rather by California's standards."¹⁸⁸ The commenter further asserted that differences in income between Ohio and California residents mean that Ohio purchasers, and by extension purchasers in other states, would be less able than California purchasers to afford the California control technology those in Ohio would allegedly be forced to purchase. EPA disagrees that manufacturers would simply build a single fleet to meet the California standards. While it is clear that some manufacturers have marketed some emission control technology in all 50 states even though it is only required under California standards (for example, Subaru has in the past marketed gasoline vehicle models that meet the "Partial ZEV" standards nationwide), not all manufacturers have done so. While the commenter apparently reasoned that the California ZEV requirement will cause a single fleet of ZEVs to be marketed nationwide, the commenter provided no evidence that this would be the case, considering the relatively large difference in effort between, for example, extending California Partial ZEV

¹⁸⁸ Ohio Office of the Attorney General, *et al.*, EPA-HQ-OAR-2023-0292-0172, pp.9–10.

capability across a national product line, and converting ICEVs to ZEVs on a national basis. Similarly, if the commenter was correct that the Ohio market cannot bear the cost of California control technology as well as the California market, this would provide stronger motivation for manufacturers to continue to provide a variety of vehicles nationally rather than a single ZEV-compliant fleet.

Several commenters opposed the ACC II waiver on the grounds that lifecycle carbon analyses (LCAs) were not a primary consideration in the rulemaking process or that CARB's analysis was incomplete because CARB had conducted LCAs for ICEVs but not for ZEVs.¹⁸⁹ For example, one commenter reasoned that CARB's public health determination was arbitrary and capricious because it "failed to focus on the complete life cycles of electric vehicles and instead focused exclusively on tailpipe emissions," stating that non-tailpipe emissions, such as those from mineral extraction and processing and vehicle production, disposal and recycling should have been considered.¹⁹⁰ In response, EPA notes that in its comments, CARB stated that it "did in fact assess and address the lifecycle emission concerns raised for ZEVs," and went on to cite its findings that, consistent with other studies, "ZEVs have lower lifecycle emissions of all pollutants than existing ICEVs."¹⁹¹ CARB also noted that its analysis included the lifecycle emissions associated with transportation fuels, including both on-road vehicle emissions and upstream emissions, using updated assumptions and including factors such as fuel production, transportation, and distribution. CARB also noted that the analysis considered the GHG emissions associated with different vehicle technologies, including production and transportation

¹⁸⁹ Sen. Shelley Moore Capito, *et al.*, EPA-HQ-OAR-2023-0292-0183, pp.4–5; Transfer Flow, Inc., pp.2–3; AFPM, EPA-HQ-OAR-2023-0292-0226, p.9; TPPF, EPA-HQ-OAR-2023-0292-0058, p.5; HF Sinclair, EPA-HQ-OAR-2023-0292-0220, p.8; API, EPA-HQ-OAR-2023-0292-0010, pp.14–15.

¹⁹⁰ HF Sinclair, EPA-HQ-OAR-2023-0292-0220, p.8.

¹⁹¹ CARB Public Hearing Response, p.8.

of materials used in ZEV technology, including batteries. CARB also pointed out that “[n]umerous studies ... also show that BEVs on average have much lower lifecycle emissions than comparable ICEVs even when accounting for manufacturing.”¹⁹² CARB also noted that “[t]he Department of Energy's cradle-to-grave lifecycle GHG emission analysis ... found that current BEVs, FCEVs, and PHEVs have lower lifecycle emissions than any ICEV or hybrid gasoline vehicle and future BEVs and FCEVs would have lower lifecycle emissions than even the lowest carbon intensity drop-in renewable fuel.”¹⁹³ CARB also noted that, “as the carbon intensity of the California grid continues to decline [...] BEV lifecycle GHG intensities will continue to fall, creating an even larger benefit compared to current ICEVs.”¹⁹⁴ Thus, it is clear that CARB considered lifecycle emissions of ZEVs and determined that they are lower than those of ICEVs. EPA has evaluated CARB’s analysis of its consideration of lifecycle emissions, and, in our technical judgment, we believe it is reasonable. EPA also notes, as described further under the discussion of the first prong (see Section III.A of the waiver Decision Document), that consideration of the waiver application does not require consideration of lifecycle emissions. Commenters’ statements regarding lifecycle analysis, or the need to consider additional specific aspects of the ZEV lifecycle, are not within the scope of EPA’s evaluation of the waiver’s consistency with CAA section 202(a).

¹⁹² EPA assumes CARB referred to both criteria pollutant and GHG emissions.

¹⁹³ CARB Public Hearing Response, p.9.

¹⁹⁴ *Id.*, pp.8–9.