



July 24, 2024

Chair Randolph and Members of the Board  
California Air Resources Board  
1001 I St.  
Sacramento, CA 95814

**Re: Advanced Clean Cars II Amendment Workshop - June 26, 2024**

Dear Chair Randolph, Members of the Board, and Staff,

Thank you for the opportunity to comment on the June 26, 2024 workshop regarding potential amendments to the Advanced Clean Cars II (ACC II) program. We support CARB's intentions to improve the program and ensure it works well with the EPA's finalized vehicle emission standards. We also support efforts to improve the program's quality to continue ensuring consumer needs and concerns are met.

At Plug In America, we have been engaged in developing the Advanced Clean Cars program and have appreciated each opportunity to participate in its development and improvement, including through the early stages of this amendment process. We look forward to continuing to collaborate with CARB on the ACC II program.

Plug In America conducts regular surveys to gather data on the electric vehicle (EV) experience. Early insights from this year's annual EV driver survey confirm that EV drivers are satisfied with their vehicles. 89.4% of EV drivers answered that it is likely that their next vehicle purchase will be an EV. This is right in line with the 2023 survey, where 89.6% of respondents said the same.<sup>1</sup>

**Light-Duty GHG Standards**

As stated in our January 2024 comments, we support CARB's renewed assessment of the impact of plug-in hybrid vehicle (PHEV) emissions. We strongly support the intention to accurately factor PHEVs into the ACC II program to ensure the program accurately measures and delivers emissions reductions. We understand and support staff's proposal to create an internal combustion engine vehicle (ICEV)-only fleet average standard starting in 2030 model year (MY), an ICEV and PHEV fleet average standard for 2030-2034, and a PHEV-only fleet average standard for 2035 and beyond.

We are intrigued by the proposal to assess PHEV emissions only from gasoline operation rendering the Fleet Utility Factor (FUF) unnecessary. We support staff's proposal to ensure that vehicles with an internal combustion engine continue to improve in efficiency based on technologies available today. While we do not oppose the suggestion to base PHEV emissions

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<sup>1</sup> 2023 EV Driver Survey, Plug In America, <https://pluginamerica.org/survey/2023-ev-driver-survey/>.

calculations on gas miles alone, we're concerned that looking *only* at gas miles will disincentivize support for PHEVs within ACCII and result in a reduction of PHEV models available to consumers. We recommend that CARB take additional action to encourage longer-range PHEVs in particular as they are more functional to drive on their all-electric range (AER). We consider long-range PHEVs to be vehicles with 90-150 miles of AER. An additional action could be in the form of a bonus credit awarded for long-range PHEVs starting in 2030 MY to align with the current proposal. Overall, we continue to support an industry cap on PHEVs to ensure they don't replace BEVs or become an outsized share of the on-road fleet.

Overall, we are interested in the lifecycle emissions of vehicles across vehicle types. Globally, in the Stated Policies Scenario (STEPS), the lifecycle emissions of a medium-size battery electric car are about half of those of an equivalent ICEV that is running on oil-based fuels and about 30% lower than for a PHEV over 15 years of operation or around 200 000 km (~124,300 miles).<sup>2</sup> In 2023, the breakeven point at which BEVs are cleaner than ICE comes after driving 41,000 km (~25,481 miles) in the US. This number is expected to be slashed to 21,000 km (~13,052 miles) by 2030. These numbers also do not take into account the potential of using recycled materials in EV batteries to decrease upfront emissions.<sup>3</sup>

We recommend that CARB conduct a study to update currently available materials that detail GHG emissions from battery mining and battery production. This emissions study can help to ensure accuracy in accounting throughout the entire ACC II program. Fully understanding the lifecycle emissions of each vehicle can ensure we're producing vehicles that meet consumer needs and contribute towards meeting overall climate and emissions goals. Though we support staff's proposal to create an ICEV-only fleet average standard starting in 2030 MY, we want to ensure the program continues to take lifecycle vehicle emissions into account.

## **ZEV Assurance Measures**

### *Increasing charging access, interoperability, and reliability*

Charging access, interoperability, and reliability remain top of mind for EV drivers. Insights from Plug In America's April 2024 quarterly survey<sup>4</sup> on the public charging experience confirm that the availability and reliability of EV charging are key concerns for EV drivers. Regarding availability, "40% of respondents said they are satisfied with the availability of public chargers when they pull into a charging station, while another 40% said they are at least unsatisfied. Drivers who primarily use the Tesla Supercharger network reported 67% satisfaction, compared to primary users of Electrify America, Charge Point, and EVgo, who reported less than 25%

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<sup>2</sup> Global EV Outlook 2024, IEA, <https://www.iea.org/reports/global-ev-outlook-2024>.

<sup>3</sup> The Lifecycle Emissions of Electric Vehicles, March 2024, BloombergNEF, <https://subscriber.politicopro.com/eenews/f/eenews/?id=0000018e-2f24-d53d-abff-7fbfdd390000#:~:text=Today%2C%20the%20breakeven%20point%20at,significantly%20in%20all%20regions%20surveyed>

<sup>4</sup> Quarterly Survey: The Public Charging Experience, April 2024, Plug In America, <https://pluginamerica.org/wp-content/uploads/2024/06/2024.05-Q1-Quarterly-Survey-Public-Charging-1.pdf>

satisfaction.” On reliability, “overall, 40% of respondents answered that they are satisfied with public charger reliability, with 39% saying they are unsatisfied.”<sup>5</sup>

These results indicate that there is room for improvement to ensure that EV drivers are supported in their charging needs. In light of these findings, and broader consensus on the importance of a seamless charging experience in enabling EV adoption, we strongly support staff’s proposal to require DIN SPEC 70121 and ISO 15118-2 as well as Plug and Charge implementation beginning in the 2028 MY. Plug and Charge offers the simplest path to charge for an EV consumer as it reduces the number of user steps needed to initiate a charge; all a driver must do is plug in the vehicle. Additionally, Plug and Charge helps to avoid some of the reliability issues experienced when attempting to initiate a charge using a different mechanism. Plug In America supports CARB pursuing Plug and Charge and continues to advocate for a variety of payment options to be available to consumers to ensure every driver can successfully charge.

As indicated in our January 2024 comments, we also support staff’s proposal to require conformance testing to DIN and ISO standards at the time of certification to ensure vehicle and charger capabilities and communication protocols are aligned. To this end, we encourage CARB to continue coordinating with the California Energy Commission (CEC) to ensure conformance standards are aligned.

Beyond staff’s proposal, Plug In America also offers the following recommendations to improve the charging experience for EV drivers.

- **Establish safety standards for charging adapters:** Significant market changes are impacting the EV charging landscape. The formerly proprietary Tesla Supercharger network has now been opened for use by non-Tesla vehicles, and major automakers have announced that they plan to transition to the NACS. These changes necessitate the use of adapters for charging to create compatibility for vehicles and chargers with different connector types. Adapters that enable access for both CCS and NACS will become more common. It is critical that these adapters are safe for use, especially considering the high power levels of many public chargers. Plug In America recommends that CARB implement a certification requirement for adapters like UL 2252 or another comparable standard.
- **Increase time for charging session authentication:** After a vehicle has been plugged in, it requires authentication within a specific time frame, which can be as short as 60 seconds, to start a charging session. Drivers can often take more than 60 seconds to authenticate the session via payment due to having to find the right credit card or network RFID card or download an app while navigating varying station design across networks and locations. If drivers exceed this authentication window, it causes a timeout where the vehicle must be unplugged and then re-plugged in to initiate the charge. This

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<sup>5</sup> Quarterly Survey: The Public Charging Experience, April 2024, Plug In America, <https://pluginamerica.org/wp-content/uploads/2024/06/2024.05-Q1-Quarterly-Survey-Public-Charging-1.pdf>

is currently a high point of failure for public charging sessions. Plug In America recommends CARB explore updating the standards in the ACC II program to allow for a longer authentication window to avoid the driver having to restart the process to initiate a charge.

- **Utilize standard charging error codes:** Currently, custom error codes create inconsistency across the charging landscape and increase the challenge of addressing charging reliability. “The variation in the definition of custom error codes makes it difficult to assess which entity in the charging ecosystem is responsible to correct errors and hinders the implementation of uniform error handling procedures across diverse charging stations and management systems.”<sup>6</sup> Plug In America recommends, to the extent possible within the scope of CARB’s authority, that CARB explore mechanisms to standardize error codes through the ACC II program to ensure vehicle capability matches charger capability. We recommend starting with the ChargeX Consortium’s Recommendations for Minimum Required Error Codes for Electric Vehicle Charging Infrastructure<sup>7</sup> and encourage continued alignment of these error codes for standardization in California and nationally.

#### *Improving consumer-facing vehicle information*

Echoing our comments from January 2024, Plug In America strongly supports staff’s attention to improving the information available through consumer-facing vehicle labels. We appreciate CARB’s attention to understanding consumer needs through a survey conducted earlier this year and support staff’s proposal to include both a DC charge rate metric (X miles added / 10 minutes) and an AC charge rate metric (X miles added / 1 hour). We recommend assessing the DC charge rate metric at 150kW and the AC charge rate metric at 7kW. While we continue to see higher power levels offered at public charging stations, the federal charging minimum requirements developed for the National Electric Vehicle Infrastructure (NEVI) and Title 23 programs stipulate that each charger must be capable of delivering 150kW at a minimum base power level per charger and offers a more realistic assessment of charging time for consumers than assuming that consumers will always be able to access higher-powered chargers (at 250kW, 350kW or more.) Additionally, for the recommended AC charge rate metric power level, 7kW is typical for Level 2 charging.

Plug In America also strongly supports staff’s proposal to make more detailed information available behind a QR code on a consumer-facing vehicle label. We believe the following information should be available on the label or via the QR code:

- **Improve range information.** The current label only provides one range metric, which is not sufficient to communicate vehicle capability as range depends on real-world

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<sup>6</sup> Recommendations for Minimum Required Error Codes for Electric Vehicle Charging Infrastructure, September 2023, ChargeX Consortium, [https://inl.gov/content/uploads/2023/07/ChargeX\\_MREC\\_Rev5\\_09.12.23.pdf](https://inl.gov/content/uploads/2023/07/ChargeX_MREC_Rev5_09.12.23.pdf).

<sup>7</sup> Recommendations for Minimum Required Error Codes for Electric Vehicle Charging Infrastructure, September 2023, ChargeX Consortium, [https://inl.gov/content/uploads/2023/07/ChargeX\\_MREC\\_Rev5\\_09.12.23.pdf](https://inl.gov/content/uploads/2023/07/ChargeX_MREC_Rev5_09.12.23.pdf).

conditions. We recommend adding separate metrics to showcase real-world range specifically for city, highway, and cold-weather driving.

- **Add “battery size” in kWh.** As more drivers become more familiar with battery vernacular, understanding the battery size can help consumers understand their overall vehicle capabilities, cost options, and charging costs under different conditions and at different locations.
- **Include “fastest charge time (From 10%-80% based on vehicle on-board charging unit)”.** Information on the fastest charge time can complement the proposed DC and AC charge metrics currently proposed by staff. Adding the time it will take to charge the vehicle from 10%-80% at the maximum speed allowed by the EV’s onboard charging unit will enlighten consumers to help them select the best charging stations to use to optimize charging speed and efficiency. Plug In America also recommends CARB consider requiring “max charge speed in kW” on the inside of the charge port door (similar to how the gas cap of an ICEV has a sticker that defines the type of fuel appropriate for the vehicle.)
- **Include battery warranty information:** While we understand that there is a federal provision that requires EV battery warranties, we recommend CARB require battery warranty information to be readily available for consumers. In 2023, Plug In America conducted a short survey which indicated that there are still consumers that are unaware of EV battery warranties and we view the label as an opportunity to better educate consumers on the protections available to them.
- **Remove MPGe, smog, and greenhouse gas scores and improve EV efficiency information.** As reflected in survey responses shared during the workshop, Plug In America does not believe the MPGe metric and smog and greenhouse gas scores are helpful for consumers. These are vague metrics that can be extremely confusing. While we understand the intention to share information on the impact of an EV and vehicle efficiency, these metrics do not provide clear enough information to be useful to consumers. We support the development of a metric that showcases vehicle efficiency and suggest that CARB consider efficiency in miles per kilowatt hour.

### *Augmenting the battery label*

We appreciate that CARB is working with manufacturers to meet battery labeling provisions in ACC II and support staff’s proposal to improve the requirements. We offer the following feedback on factors beyond staff’s proposal. The Inflation Reduction Act creates new sourcing requirements for the minerals and battery components that manufacturers must comply with for their vehicles to be eligible for the 30D tax credit, which can provide up to \$7,500 per EV. It is possible that federal tax credit compliance will require a system to verify and communicate mineral and component origins. Therefore, we recommend that CARB expand the common digital identifier to create a *unique digital identifier* (accessible via a QR code) for each individual battery. This can provide data that is necessary for reuse, repurposing, and recycling. Essential information featured in a digital battery identifier should include: battery state of health, battery chemistry, recycled and PFAS content, manufacturing history and origin of each battery’s

materials, use history, safe handling and end-of-life management, and other key environmental and human rights information on batteries.<sup>8</sup>

The EU Battery Law included a Battery Passport<sup>9</sup> to fulfill the requirements of the EU Sustainable Batteries Law and Corporate Sustainability Due Diligence Directive. The US should implement something similar to the Battery Passport to maintain a competitive edge in EU markets, ensure sourcing transparency, support end-of-life processes, and track the overall lifecycle of batteries. Because of the unique sourcing requirements from 30D, we recommend that CARB go beyond the EU Battery Regulations to ensure that there are *traceability* standards in the digital battery identifier. We encourage CARB to leverage any existing proposed regulations and expertise in terms of digital battery identifiers to create an easy compliance process for automakers, to the ultimate benefit of consumers, who can then claim the 30D credit on compliant vehicles. We believe it would be beneficial if CARB coordinates with federal agencies to ensure that requirements and standards for digital battery identifiers are aligned.

Additionally, we encourage CARB to explore how a battery labeling system featuring a digital battery identifier could help achieve other goals, including expanding recycling, second-life applications, and supply chain goals through enhanced collection, sorting, and tracking.

We agree with CARB that battery state of health metrics should be part of the ACC II data standardization requirements. Battery state of health can be used to determine whether a battery will be reused, repurposed, or recycled. It would allow interested parties to instantly assess how much life is left in an EV battery. Increasing access to state of health information on EV batteries can be extremely beneficial for the second-life supply chain by allowing users to maximize the value of the battery by understanding its suitability for different applications.

## **Conclusion**

Plug In America thanks CARB for its diligent efforts to ensure that the ACC II program delivers on its intended goals to reduce emissions and improve air quality and public health. Thank you again for the opportunity to provide feedback and for your consideration of these comments. Please do not hesitate to reach out to Alexia Melendez Martineau, Senior Policy Manager, Plug In America, at [amartineau@pluginamerica.org](mailto:amartineau@pluginamerica.org) with any questions or for further discussion.

Sincerely,

Joel Levin  
Executive Director, Plug In America

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<sup>8</sup> Battery Passports, 2024, GAIA, <https://www.no-burn.org/wp-content/uploads/2024/06/05-Battery-Infosheet-Battery-Passports.pdf>.

<sup>9</sup> Proposal for a Regulation of the European Parliament and of the Council concerning batteries and waste batteries, <https://data.consilium.europa.eu/doc/document/ST-5469-2023-INIT/en/pdf> (Chapter VIII)