



Jan 16, 2024

SUBMITTED ELECTRONICALLY TO: <https://ww2.arb.ca.gov/public-comments/comment-log-advanced-clean-cars-ii-amendments-november-workshop>

Re: November 15, 2023, Public Workshop on Proposed Amendments to the Advanced Clean Cars II (“ACCII”) Regulation

To Anna Scodel,

Rivian Automotive, LLC, (“Rivian”) participated in the November 15, 2023, workshop on proposed amendments to the ACCII regulation. We welcome the discussions initiated by the workshop and appreciate this opportunity to submit initial feedback on the presentation. We look forward to more detailed dialogue with staff and other stakeholders during upcoming workshops.

Our comments below reflect on the concepts presented at the workshop. One of our top priorities for this proceeding is the proposed update to the state’s greenhouse gas (“GHG”) emissions standards for light-duty vehicles. This is a crucial regulation with major implications for the success of our collective efforts at both the state and national levels to address climate change. Just as important to Rivian are the proposals to develop new ZEV assurance measures including charging interoperability standards, conformance testing, and consumer-facing vehicle labels. Interoperability and conformance testing is an important area of discussion, but it is critical for the continued growth of the EV industry in California and elsewhere that communication protocol requirements and conformance testing for vehicles are not prematurely adopted. And while we appreciate the motivations for considering additional ZEV labeling requirements, CARB should weigh the impact of additional test burdens on automakers and care must be taken to avoid causing confusion or overwhelming consumers with data.

Keep the World Adventurous Forever

Founded in 2009, Rivian is an independent U.S. company headquartered in California. With over 16,000 employees across the globe, Rivian’s mission is to Keep the World Adventurous Forever. Rivian’s focus is the design, development, manufacture, and distribution of all-electric adventure vehicles, specifically pickups, sport utility vehicles (“SUVs”), and commercial vans. Key to the success of our mission, these vehicles will displace some of the most polluting conventional vehicles on the road today.

Rivian brought the first modern electric pickup to market in 2021 when we launched the R1T from our manufacturing facility in Normal, Illinois, followed shortly thereafter by the R1S SUV and the EDV commercial van for Amazon. The R1T and R1S—both medium-duty passenger vehicles (“MDPVs”)—provide all-electric options in segments where added utility is a necessity. The R1T has an EPA-certified range of up to 410 miles. The R1S is certified at up to 400 miles. The truck also features 11,000lbs of towing capacity, while the R1S is a seven-passenger full-sized SUV. Both are well-equipped for off-roading in a range of climates. Separately, our Class 2b and 3 commercial vans eliminate tailpipe emissions from

last-mile delivery. Rivian is committed to producing 100,000 vans for our launch customer, Amazon, with more than 10,000 already in service in more than 800 U.S. cities. The electric van is now also available for purchase by other fleet customers in addition to Amazon. Beyond our vehicle lineup, Rivian is also building a network of DC fast chargers across the country known as the Rivian Adventure Network (“RAN”). More than 50 RAN stations are already in service across the United States, including many sites up and down California.

Establish Stringent GHG Standards for MY2026 and Beyond

Rivian strongly supports the staff’s goal to develop new GHG standards for Model Year 2026 (“MY2026”) and beyond. Unless revised, CARB’s current GHG requirements will plateau in MY2025. Yet the need to achieve deep GHG emissions reductions from the light-duty transportation sector is only becoming more urgent over time. There are several reasons why strict California GHG requirements are important.

- **Uncertainty in federal policy.** Unfortunately, we cannot rely on federal standards to drive sustained reductions in tailpipe GHG emissions. Instability has become a hallmark of federal policy in recent years. While U.S. EPA recently proposed ambitious new GHG requirements for vehicles for the MY2027-MY2032 timeframe, the risk of a future rollback or weakening of those requirements exists. Strong requirements set by California and enforced across Section 177 states will hedge against federal regulatory instability, providing much needed certainty for all stakeholders, not least the automotive industry.
- **Backstop the ZEV sales requirement.** Some stakeholders might argue that the state’s ZEV sales requirement renders a companion GHG standard unnecessary. However, the risk of litigation and unpredictable judicial rulings means that a ‘belt-and-suspenders’ approach to climate policy has never been so prudent. Should future litigation threaten the state’s ZEV program, a robust GHG regulation could serve as a crucial fallback policy for achieving the state’s statutory emissions reduction goals. Moreover, the GHG requirements would be a key climate policy tool available to Section 177 states who might choose to enforce only the California LEV program and forgo the ZEV standards.
- **Combat emissions backsliding in the non-ZEV fleet.** Because ZEVs will do much of the ‘heavy lifting’ in support of fleet average compliance under the federal standards, conventional vehicles could degrade in their emissions performance. The staff presentation previewed a worrying trend toward increasing non-ZEV GHG emissions even under a compliance scenario.¹

In support of CARB developing the next round of GHG standards, Rivian makes the following initial recommendations.

- **Set long-term targets.** To maximize regulatory certainty and harmonize with the existing ACCII regulations, CARB should establish GHG targets through MY2035.
- **Ensure ultimate equivalency between the GHG standard and the ZEV sales requirement.** As a topline goal and principle, the MY2035 GHG target should match the fleet average emissions rate

¹ California Air Resources Board, November 15, 2023, Staff Presentation: *Advanced Clean Cars II Amendments Kick-Off Workshop*, available at www.arb.ca.gov/sites/default/files/2023-12/2023_11_15%20ACC%20II%20Amends%20Workshop%20slides_ADAv2.pdf.

implied under ACCII's ZEV sales mandate, accounting for upstream emissions (updated appropriately as proposed below) and permissible PHEV sales.

- We note that the staff presentation raised the possibility of setting a maximum certification value for ICEs as one possible approach to setting the emissions standard. While this is a reasonable concept that merits further study, CARB could achieve the same climate benefits with a sufficiently stringent fleet-average approach, avoiding the need to fundamentally alter the structure of the emissions regulation. In the context of GHG emissions, fleet averaging is a tried-and-tested, environmentally sound approach and would preserve some compliance flexibility for conventional automakers.
- **Establish an annual rate of improvement at least equal to that in EPA's MY2027-2032 *Alternative 1* proposal.** Rivian appreciates the staff's interest in considering alignment with EPA's requirements "where appropriate."² There are certain technical aspects of EPA's proposal where alignment clearly makes sense (more on this below). However, the agency's central proposal for the GHG standards themselves was insufficiently stringent and would likely far fall short of the reductions industry can achieve in California. In our analysis, we found that EPA's *Alternative 1* better reflected the emissions reduction potential of the light-duty vehicle fleet, though even this is best thought of as a floor.³ On average, EPA's *Alternative 1* requires annual improvements in emissions of about 15 percent for the combined car and truck fleet.⁴ Using the known endpoint for MY2035 as a bookend, CARB could apply this rate of improvement to the MY2025 baseline under the current regulation as a reasonable starting point for developing the agency's proposal, refining it as necessary to arrive at an MY2035 standard consistent with the 100 percent ZEV sales requirement.
- **Revise the PHEV Fleet Utility Factor ("FUF").** We applaud staff for seeking input on the FUF and acknowledging that the current FUF overstates the emissions benefits of PHEVs. As Rivian has commented in the past, PHEVs exhibit significant variability in their environmental performance. Research from Europe shows that PHEVs deliver poorer environmental benefits in real-world usage than certified under test procedures, with troubling implications for the projected benefits of regulatory programs that encourage the development and sale of these vehicles.⁵ In the United States, PHEVs drive fewer electric miles than assumed for labeling purposes, with fuel consumption as much as two-thirds higher than nominally anticipated.⁶ Simply put, on average PHEV drivers do not plug in their vehicles as much as was previously assumed and the weight of the evidence clearly suggests a need to revise the FUF. An accurate FUF, reflecting CARB's onboard diagnostic data, would ensure that the GHG regulation works as intended—achieving reliable, real-world emissions reductions.

² *Id.*, slide 12.

³ For Rivian's full analysis and our technical comments on EPA's proposal, please see our comments available at: www.regulations.gov/comment/EPA-HQ-OAR-2022-0829-0653.

⁴ Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles, 88 Fed. Reg. 87, 29,184-29,446 (May 5, 2023) (revising 40 C.F.R. Parts 85, 86, 600, 1036, 1037, and 1066), 29,202.

⁵ Patrick Plotz et al., The International Council on Clean Transportation, *Real-World Usage of Plug-In Hybrid Electric Vehicles in Europe: A 2022 Update on Fuel Consumption, Electric Driving and CO₂ Emissions* (June 2022), available at www.theicct.org/publication/real-world-phev-use-jun22/.

⁶ Aaron Isenstadt, Zifei Yang, Stephanie Searle, and John German, The International Council on Clean Transportation, *Real-World Usage of Plug-In Hybrid Electric Vehicles in the United States* (December 2022), available at www.theicct.org/publication/real-world-phev-us-dec22/.

- **Consider technical adjustments to the target curves to reduce the incentive to upsize vehicles.** A key aspect of EPA’s proposal with which alignment might be valuable is the adjustment proposed to the mathematical functions of the car and truck standards. Specifically, CARB should consider whether ‘flattening’ the slopes of the standards curves and narrowing the difference in stringency between the car and truck curves could play a role in moderating any perverse incentives within the regulation for manufacturers to upsize and/or reclassify vehicles.
- **Maintain parity between EVs and ICEs with respect to air conditioning efficiency and leakage credits.** If CARB elects to establish an ongoing refrigerant leakage standard or provide AC efficiency credits, Rivian strongly encourages the agency to maintain a level playing field between EVs and ICEs, making all vehicles eligible for credits regardless of powertrain.
- **Update upstream emissions as part of this review.** Rivian supports accounting for the upstream emissions of EVs under the GHG standards, and CARB should update its grid carbon intensity (“CI”) estimates. These estimates should be revised annually to reflect ongoing improvements in grid CI as deployment of renewables accelerates. To ensure a level playing field and reflect the environmental costs of fossil fuel extraction and refining, CARB should also account for the upstream emissions of ICEs under the GHG regulation.

Take a Balanced Approach to New ZEV Labeling Requirements

Rivian supports transparent range and consumption metrics for electric vehicles. Transparency is a worthy goal; however, care must be taken to avoid causing confusion or overwhelming consumers with data. New labelling requirements should consider the differences between medium-duty vehicles and passenger vehicles and the possible confusion new passenger vehicle labels might cause with existing labeling requirements and current in-use terminology. CARB should also consider the impact of added test burden, particularly to medium-duty vehicles, where fleet purchasers are normally well informed on vehicle attributes.

In the medium-duty categories where the primary purpose of vehicle is sometimes that of a passenger vehicle, new range and consumption labelling should consider how basic testing provisions and vehicle attributes might impact labeling differently for MDVs as opposed to passenger vehicles. MDVs are used in a broader set of applications than passenger vehicles and MDV test mass is calculated differently than passenger vehicles. Any new MDV labelling requirements need to clearly differentiate from passenger vehicle labels and provide for an optional method of providing range and efficiency metrics equivalent to passenger vehicle use-cases for MDVs.

CARB should also consider any differences with current labeling requirements and common in-use metrics. Deviation from existing label metrics should be readily explained to would-be customers and add valuable information to the buying decision. As a guiding principle, metrics should be simple and relate to drivers in everyday terms while not introducing new relative scoring. Although metrics at additional ambient temperatures over new drive cycles might yield more information, an ideal combined set of simple values would continue to satisfy CARB, US EPA, and DOE requirements and incorporate current regulatory and statutory requirements.

Added test burden should be avoided where possible. CARB should look to expand the use of analytically derived values in instances where testing will yield little additional useful information. For example, analytically derived range and consumption values should be considered for incremental mass and tire changes, similar to what is allowed today for gasoline vehicles. CARB should also make range and efficiency testing for Class 2b MDVs optional. Fleet customers typically are well aware of vehicle attributes and adding test burden will increase the cost of MDVs and possibly delay vehicle introduction. If manufacturers elect to provide Class 2b MDVs range and efficiency data, the metrics should be comparable to passenger vehicle metrics to satisfy interest in comparing the possible passenger vehicle use of MDVs.

Careful Consideration is Needed Before Adopting Communication Protocol and Conformance Testing Requirements

We appreciate the staff's interest in addressing charging reliability issues by looking more closely at the role of vehicle interoperability and thus achieving reliable charging sessions. While this is an important area of discussion, it is critical for the continued growth of the EV industry in California and abroad that communication protocol requirements and conformance testing for vehicles are not prematurely pursued. Each of the protocols suggested by staff to consider are at various stages of maturity and merit individual evaluation.

DIN 70121

We encourage staff to focus on evaluating requirements and conformance testing for DIN 70121 given its broad industry adoption, relative stability in terms of updates and amendments, and its common role as the backstop when public charging transactions aren't successful using other communication protocols. However, we request industry stakeholders be given enough time to assess and provide feedback on the relevant sections of DIN 70121 and that staff evaluate the cost implications to the state and industry of conformance testing. Both will be critical to identifying a solution that will truly improve charging reliability without unduly burdening industry during a critical time. We also encourage staff to propose more specifics around what a conformance testing process for DIN 70121 would look like and how it would compare to CARB's current conformance testing activities.

ISO 15118-2

We encourage staff to conduct further discussions with industry to evaluate whether a requirement and conformance testing are feasible and valuable for improving charging reliability. There is significant activity occurring across various industry stakeholder groups working to make the charging experience more reliable when leveraging ISO 15118-2. This includes but is not limited to the federally funded ChargeX Consortium,⁷ the CharIN Biannual Festival Events,⁸ American Mobility Center's announcement of an

⁷ <https://inl.gov/chargex/>.

⁸ <https://www.charin.global/events/charin-festival-na-2023/>.

Interoperability Clearing House,⁹ SAE's EVPKI Consortium,¹⁰ the Joint Office-funded Everest data platform.¹¹ Given this range of activity addressing the same fundamental issue of charging reliability, additional conformance testing for ISO 15118-2 may be premature.

ISO 15118-20

At this stage in the broader EV industry, we do not support a requirement or conformance testing for ISO 15118-20. The first draft of ISO 15118-20 was only just published in April 2022, with efforts already underway to amend it.¹² Given the relative newness of this standard, the ongoing efforts to update it to meet the rapidly evolving needs of industry, and the industry's primary focus on enabling baseline Plug and Charge functionality, we strongly encourage staff to not proceed with any requirements or conformance testing for ISO 15118-20. In addition, it is important to acknowledge that ISO 15118-20 is not backwards compatible with ISO 15118-2. Therefore, automakers will likely need to develop entirely new software stacks to implement ISO 15118-20, resulting in extended timelines for commercial deployment. Finally, the main, near-term commercial value of ISO 15118-20 is the enablement of bi-directional charging, which can be deployed in many commercial use cases by leveraging other communication protocols.

Finally, we'd like to specifically comment on staff's inclusion of the 2023 VOLTS Event Interoperability Test Data as part of the justification for the proposed requirements and conformance testing. Typically, industry testing events are opportunities for industry to test new, developing and importantly, non-production portions of charger and vehicle hardware and software. Data from test events like VOLTS are therefore unrepresentative of an EV driver's charging experience in the field and we discourage the use it to inform and justify regulation. Based on Rivian's own internal data from over 1 million charging sessions on Rivian vehicles over the past 2 years on third party charging networks (i.e. no Plug and Charge or ISO 15118-2 functionality), the highest percentage of issues causing charging sessions to not end in a successful charging state pertain to the payment and contract authorization process. Where a commercial agreement is not in place between an automaker and a third-party charging network for Plug and Charge functionality, payment processing issues typically occur due to user interface or user experience challenges, not the communication protocols being used. The consistent challenges around payment have been further validated and investigated by the federally funded ChargeX Consortium's dedicated Payments Task Force. If staff have not already engaged with the ChargeX leadership on the work being done on the federal level to address charging station reliability, we highly encourage them to do so to help further inform this proposal.

⁹ "First-of-its-kind System Intends to Deliver Charging Ecosystem Players a Centralized Hub for Ongoing Compatibility Testing for the EV Industry," *PR Newswire*, January 8, 2024, available at www.prnewswire.com/news-releases/first-of-its-kind-system-intends-to-deliver-charging-ecosystem-players-a-centralized-hub-for-ongoing-compatibility-testing-for-the-ev-industry-302027868.html?tc=eml_cleartime.

¹⁰ <https://www.sae.org/news/press-room/2023/11/ev-ecosystem-public-key-infrastructure-consortium>.

¹¹ <https://lfenergy.org/projects/everest/>.

¹² <https://www.iso.org/standard/87920.html>.

Other Charging-Related Topics

We also request staff consider two other proposed changes to the current ACCII regulation:

- **Review the Convenience Cord Requirement.** We request staff to review 13 CCR § 1962.3(c)(3) (the “Electric Vehicle Charging Requirements”) in this rulemaking. Among other charging requirements established for ZEVs, the Electric Vehicle Charging Requirements stipulate that, starting from the model year (MY) 2026, all ZEVs must be equipped with a “convenience cord,” a dual-amperage charging cord featuring user-selectable capabilities for both AC Level 1 and AC Level 2 charging. While we understand the intent to provide access to the benefits of Level 2 home charging for all drivers, we encourage staff to re-evaluate the current regulation to instead require convenience cords to be available as add-ons during the purchasing/leasing process. Convenience cords do not alleviate the need for on-site electrical work to ensure safety and they are notably underutilized based on our internal analysis. Given our aggressive, industry leading goal to launch a vehicle with half the carbon footprint of the 2022 R1 line-up by 2030,¹³ we are also concerned regarding the sustainability implications of a requirement for an underutilized convenience cord, as well as the potential downstream waste impacts.
- **Formally Include the SAE J3400 Standard.** Given the significant industry shift to SAE J3400 since May 2022¹⁴, we encourage staff to consider an amendment to 13 CCR § 1962.3 to specifically include the SAE J3400 standard as an option for charger inlets for MY 2026 and beyond. The Technical Information Report (TIR) for SAE J3400 was released in December 2023¹⁵, with a final standard expected in mid-2024, well in advance of MY 2026 vehicles hitting the market. It is critical for industry product timelines and development to have certainty regarding vehicle requirements multiple years in advance. Therefore, we encourage staff not to delay making this adjustment and include it in the next round of updates to ACCII.

Conclusion

Rivian welcomes the discussions initiated by the workshop and presentation on November 15, 2023. Updating the light-duty GHG standard in California is crucial and Rivian strongly supports the most stringent requirements that will align with the state’s 100 percent ZEV sales requirement. CARB might wish to use the annual rate of improvement proposed under EPA’s MY2027-2032 Alternative 1 as a starting point for developing the revised standards. We also recommend revising the PHEV FUF, maintaining parity between EVs and ICEs in any ongoing air conditioning leakage and efficiency standards, updating the upstream emissions assumptions, and considering technical adjustments to the standards curves. With

¹³ For more information, see Rivian’s sustainability impact report, *Our Impact Journey: Rivian’s Approach to Building a Business for a Thriving Planet*, available at www.stories.rivian.com/impact-report.

¹⁴ Eric Stafford, “Tesla Charging Network: All the Upcoming Compatible EVs,” *Car and Driver*, December 20, 2023, available at www.caranddriver.com/news/a44388939/tesla-nacs-charging-network-compatibility/.

¹⁵ SAE International, “SAE International Releases Technical Information Report for Standard to Expand Access to EV Charging” (press release), December 19, 2023, available at [www.sae.org/news/press-room/2023/12/sae-j3400-tir-press-release#:~:text=\(Dec.,EV\)%20drivers%20across%20North%20America](http://www.sae.org/news/press-room/2023/12/sae-j3400-tir-press-release#:~:text=(Dec.,EV)%20drivers%20across%20North%20America).

respect to ZEV labels, we encourage CARB to consider the differences between medium-duty vehicles and passenger vehicles, the risk of overwhelming consumers with data, presenting useful information that relates to the daily driving experience, and the impact of added test burden on manufacturers. Finally, while we appreciate discussions regarding charging interoperability, adopting specific requirements and conformance testing might be premature. We encourage CARB to evaluate each standard individually, along with substantive input from industry's technical experts and consideration of relevant industry context to determine whether the proposal will materially advance charging reliability in California.

Thank you for the opportunity to provide initial feedback and comments. Please contact me with any questions. Rivian would welcome the chance to discuss these issues in more detail. We look forward to future workshops and engaging with staff and other stakeholders in this matter going forward.

Sincerely,

A handwritten signature in blue ink, appearing to read "Chris Nevers". The signature is fluid and cursive, with a long horizontal stroke at the end.

Chris Nevers
Rivian Automotive, LLC