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Submitted electronically.

Liane Randolph, Chair
California Air Resources Board
1001 I Street
Sacramento, CA 95814
VIA E-mail: cleancars@arb.ca.gov

Re: Comments on the Kick-Off Workshop for CARB's Proposed Amendments to the Advanced Clean Cars II Regulations

Dear Chair Randolph:

Pursuant to the California Air Resources Board's (CARB's) Advanced Clean Cars II Amendments Kick-Off Workshop held on November 15, 2023,[1] Tesla respectfully submits the following comments. Tesla incorporates by reference its written comments in response to previous ACC II workshops and presentations.

Tesla continues to support CARB and the state of California in defending the state's authority under §209 of the Clean Air Act and the state's vehicle greenhouse gas (GHG) emissions standards.[2] Tesla shares and appreciated the goals, direction, and leadership CARB has exhibited in its ACC II process and proposal. Indeed, Tesla is grateful to CARB staff for the ongoing engagement and technical conversations throughout the process.

I. Tesla's Mission and its California Manufacturing Footprint

Tesla's mission is to accelerate the world's transition to sustainable energy. Moreover, Tesla believes the world will not be able to solve the climate change crisis without directly reducing air pollutant emissions - including carbon dioxide and other greenhouse gases - from the transportation and power sectors.[3] To accomplish its mission, Tesla designs, develops, manufactures, and sells high-performance fully electric vehicles and energy generation and storage systems, installs, and maintains such systems, and sells solar electricity.[4] Consistent with this effort, recently, Tesla was ranked as the world leader in the transition to vehicle electrification.[5]

Tesla currently produces and sells four fully electric, zero emissions light-duty vehicles (ZEVs): the Model S sedan, the Model X sport utility vehicle (SUV), the Model 3 mid-sized sedan, and the Model Y mid-sized SUV. As an EV-only manufacturer, as the EPA recognized in its *2023 Automotive Trends Report*, Tesla had by far the lowest carbon dioxide emissions (0 g/mi) and highest fuel economy (120 miles per gallon) of all large vehicle

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[1] California Air Resources Board, Advanced Clean Cars II Amendments Kick-Off Workshop*, available at* https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program/meetings-workshops (Nov. 15, 2023).
[2] See e.g., *Ohio, et al. v. EPA*, Docket No. 22-1081 (D.C. Cir. filed May 12, 2022) (defending reinstatement of EPA's CAA waiver for Advanced Clean); *Union of Concerned Scientists v. NHTSA*, Docket No. 19-1230 (Consolidated with 19-1239, 19-1241, 19-1242, 19-1243, 19-1245, 19-1246, 19-1249) (D.C. Cir. filed Nov. 15, 2019) (challenging EPA's CAA waiver withdrawal and protectively challenging NHTSA's EPCA preemption rule); *California, et al. v. EPA,* Docket No. 18-1114 (consolidated) (D.C. Cir., Oct. 25, 2019); Tesla, Comments to EPA on Reinstating California Waiver (July 6, 2021) *available at* https://www.regulations.gov/comment/EPA-HQ-OAR-2021-0257-0136; Tesla, Comments on NHTSA's Preemption Regulations (June 11, 2021) *available at* https://www.regulations.gov/comment/NHTSA-2021-0030-0398
[3] See, Tesla, Master Plan Part 3 (Apr. 5, 2023) *available at* https://www.tesla.com/ns_videos/Tesla-Master-Plan-Part-3.pdfhttps://www.tesla.com/ns_videos/Tesla-Master-Plan-Part-3.pdf
[4] See, Tesla, Impact Report 2022 (Apr. 24, 2023) *available at* https://www.tesla.com/ns_videos/2022-tesla-impact-report-highlights.pdf
[5] See, ICCT, The Global Automaker Rating 2022: Who Is Leading the Transition to Electric Vehicles? (May 31, 2023) *available at* https://theicct.org/publication/the-global-automaker-rating-2022-may23/

manufacturers in MY 2022.[6] Additionally, in December 2022, Tesla initiated delivery of its Tesla Semi Class 8 day cab truck[7] and in December 2023, delivery of its Cybertruck.[8]

Tesla the largest manufacturing employer in California and employs more than 42,500 people in state. Tesla manufactures and assembles operations of vehicles, its advanced 4680 lithium-ion battery cells, and battery packs at its factories in Fremont, CA. [9] It also produces Megapack, a utility-scale grid storage battery, at its factory in Lathrop, CA. [10] In 2021, Tesla's investment in California helped deliver $10.4 billion ($28.5 million per day) to California's gross state product.[11]

Importantly, Tesla is not only a manufacturer but is also continuing to grow its large network of retail stores, vehicle service centers, collision centers, and electric vehicle charging stations to accelerate and support the widespread adoption of electric vehicles.[12] Tesla has over 60 stores and galleries and over 45 Service Centers in California. Tesla also operates the country's largest and most reliable public EV charging network. Since 2012, Tesla has invested heavily in siting, building, operating, and maintaining charging infrastructure. In 2013, Tesla had just eight Supercharger Stations in North America. Today, Tesla owns and operates the largest DCFC network in the world, known as the Tesla Supercharging network.[13] In California, Tesla has 419 Tesla Supercharger locations currently in California with over 6,500 charging stalls.

Per the comments below, Tesla seeks to ensure CARB adopts new ACC II amendments that support the acceleration of ZEV adoption, facilitate ease of consumer experience, and ensure vehicle affordability.

II. Tesla Supports Development of Stringent New MY 2026 and Beyond GHG Standards

Tesla agrees that maintaining a separate California light-duty GHG emissions program is both necessary to ensure the public health and welfare of all Californians and to protect against the volatility of less protective federal standards. In 2020, the federal GHG and fuel economy standards were abruptly reduced in stringency significantly impacting the rate of emissions reduction.[14] These abrupt changes threatened to alter the course of California's emission standards and significantly increase GHG emissions.[15] Appropriately, this also led to the action to protect the viability of California's existing standards.[16]

Per Section 209 of the Clean Air Act, CARB should enact a standard that is more protective than EPA's proposed MY 2027 – 2032 standards.[17] Moreover, in the first half of 2023, California recorded the highest EV share of total

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[6] EPA, The 2023 EPA Automotive Trends Report, Greenhouse Gas Emissions, Fuel Economy, and Technology Since 1975 (Dec. 2023) at 11-14, *available at* https://www.epa.gov/automotive-trends/download-automotive-trends-report#Full%20Report
[7] See, Tesla, Tesla Semi Delivery Event (Dec. 1, 2022) *available at* https://livestream.tesla.com/https://livestream.tesla.com/; See generally, Tesla, Semi: The Future of Trucking *available at* https://www.tesla.com/semihttps://www.tesla.com/semi
[8] Tesla, Cybertruck, *available at* https://www.tesla.com/cybertruckhttps://www.tesla.com/cybertruck
[9] See, Inside EVs, Tesla 4680 Cell Production Ramping Quickly, Won't Impact Cybertruck (Oct. 20, 2022) *available at* https://insideevs.com/news/617588/tesla-4680-cell-ramp-wont-impact-cybertruck-other-models/
[10] Tesla, Megapack *available at* https://www.tesla.com/en_eu/megapackhttps://www.tesla.com/en_eu/megapack
[11] IHS Markit, The Economic Contributions of Tesla to the California Economy, 2018–2021 (October 2022) (detailing Tesla's positive economic impact in California) *available at* https://www.tesla.com/blog/teslas-california-footprint
[12] See, 86 Fed. Reg 43726, 43799 (Aug. 10, 2021) ("Electrification of the vehicle fleet is likely to affect both the number and the nature of employment in the auto and parts sectors and related sectors, such as providers of charging infrastructure.").
[13] See, Tesla, Supercharger *available at* https://www.tesla.com/supercharger
[14] See, 84 Fed. Reg. 51310 (Sept. 27, 2019); 85 Fed. Reg. 24174 (Apr. 30, 2020).
[15] See e.g., Rhodium Group, The Undoing of US Climate Policy: The Emissions Impact of Trump-Era Rollbacks (Sept. 17, 2020) available at https://rhg.com/research/the-rollback-of-us-climate-policy/?source=email
[16] See, Statement by CARB Chair on Action To Preserve California Vehicle Standards (Sept., 28, 2018) *available at* https://ww2.arb.ca.gov/news/statement-carb-chair-action-preserve-california-vehicle-standards/printable/print
[17] 88 Fed. Reg. 29184 (May 5, 2023).

car sales, with 25 percent of all vehicles sold being electric – nearly three times the national average.[18] Given these ZEV deployment levels, Tesla believes that the specific GHG standard should achieve fleet wide levels significantly more stringent than EPA's estimated 82 g CO2/mi in 2032 to ensure that large scale adoption of BEVs does not all the internal combustion fleet to increase it emissions and ICE technology remains of pace to increase efficiency and share the burden of reducing of emissions.

A. Tesla Supports Development of an Anti-Backsliding Mechanism

Tesla also supports CARB's development of an anti-backsliding mechanism. In doing so, CARB should not remove ZEVs from calculating the fleet wide standard. Rather, CARB should assess several options including a maximum allowable grams CO2/mi emission level for each vehicle enforced at vehicle certification. Another option would be an acceleration mechanism where a certain credit bank to deficit ratio would prompt CARB to ratchet down the overall fleetwide emission standard in future years.

B. Tesla Supports Lowering the Fleet Utility Factor for PHEVs

CARB should revisit the PHEV Fleet Utility Factor because PHEV compliance to date has significantly underestimated CO2 emissions by overestimating their use of electricity.[19] Reducing the PHEV fleet utility factor is appropriate and overdue.

PHEVs have consistently been overrewarded compared to their actual emissions reduction performance.[20] In a 2020 study, the International Council on Clean Transportation (ICCT) found that real-world PHEV fuel consumption and emissions were about 2-4 times higher than certified levels.[21] According to ICCT, one of the main reasons for this is that, "For private cars, the average utility factor (UF)—an expression for the portion of kilometers driven on electric motor versus kilometers driven on combustion engine—is 69% for New European Drive Cycle (NEDC) type approval but only around 37% for real-world driving. For company cars, an average UF of 63% for NEDC and approximately 20% for real-world driving was found."[22] Essentially, PHEV drivers utilize ICE engines for travel far more than electric drive when operated in real world conditions. Similarly, Transport and Environment found that emissions from three of the most popular PHEVs in the EU were 28-89% higher than certified levels even under ideal test conditions (e.g., fully charged battery).[23] Other studies suggest hybrids offer little benefit compared to ICE vehicles.[24] Indeed, CARB has also recognized these concerns in the past by calling out excessive PHEV cold start emissions.[25] In sum, Tesla supports the agency revisiting the PHEV Fleet Utility Factor.

III. CARB Should Appropriately Adopt New ZEV Assurance Measures

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[18] Inside EVs, California Tops US EV Adoption: 25% EV Share Of Total Sales In H1 2023 (Sept. 27, 2023) *available at* https://insideevs.com/news/688779/california-tops-us-ev-adoption-25-percent-share-total-sales-h1-2023/#:~:text=Unsurprisingly%2C%20California%20recorded%20the%20highest,by%20Oregon%20with%2017%20percent.

[19] 88 Fed. Reg. at 29252.

[20] See e.g., Guardian, Major plug-in hybrid cars pollute more than official measures suggest (Feb. 7, 2023) *available at* https://www.theguardian.com/environment/2023/feb/08/major-plug-in-hybrid-cars-pollute-more-than-official-measures-suggest

[21] ICCT, Real-World Usage of Plug-In Hybrid Electric Vehicles: Fuel Consumption, Electric Driving, and CO2 Emissions (Sept. 27, 2020) *available at* https://theicct.org/publication/real-world-usage-of-plug-in-hybrid-electric-vehicles-fuel-consumption-electric-driving-and-co2-emissions/

[22] Id., at 1.

[23] Transportation & Environment, Fixing the PHEV Loophole (Dec. 2021) *available at* https://www.transportenvironment.org/wp-content/uploads/2022/02/2022_TE_position_PHEV_UF_timeline.pdf; See also, CleanTechnica, Plugin Hybrid Cars Pollute 200–400% More Than Official Ratings (Feb. 13, 2022) *available at* https://cleantechnica.com/2022/02/11/phevs-pollute-2-4x-more-than-official-ratings-lets-fix-the-eu-loophole/

[24] See e.g., Impact Living, Study on the Consumption of Plug-in Hybrid Vehicles in Valais Topography (Jan. 11, 2022) *available at* https://impact-living.ch/wp-content/uploads/2022/01/Consommation-vehicules-hybrides-rapport-publie-IMPACT-LIVING-canton-Valais-11-01-22.pdf

[25] CARB, Advanced Clean Cars (ACC) II Workshop Presentation at 27 (May 6, 2021) *available at* https://ww2.arb.ca.gov/sites/default/files/2021-05/acc2_workshop_slides_may062021_ac.pdf

A. Interoperability

During the workshop, CARB indicated that it was evaluating opportunities to help address the interoperability challenge that California is facing with public EV charging infrastructure today.[26] Tesla prides itself on achieving an extremely reliable, efficient, and cost-competitive EV charging user experience on its DC fast charging network (Superchargers) across CA. As highlighted in our public impact report, Tesla's uptime is 99.96%.[27] At the same time, Tesla has been able to provide seamless plug and charge access for Tesla drivers obviating the need for a screen or payment terminal on the EV charger which can often be a point of failure. Finally, according to JD Power, Tesla drivers consistently rank the performance of the network above the industry average.

Tesla appreciates CARB staff's consideration for evaluating opportunities to help solve the challenge of EV charging reliability and interoperability. It appears that CARB's focus is mostly on the communication protocol between the EV charger and the EV that can help authenticate a charging session. However, we do not believe that mandating a specific communication protocol on the vehicle-side, will necessarily achieve CARB's desired outcomes. In the workshop CARB indicated it will evaluate ISO 15118-2, ISO 15518-20 and DIN 70121. Standardized communications protocols are important, but none of the aforementioned excels in interoperability. Moreover, comparing them is a matter of feature comparison and use case comparison, not a matter of reliability nor interoperability. Furthermore, CARB is not in a position to pick a protocol winner, given the ongoing development nature of much of the efforts around ISO15118, in particular -20, and the lack of conformance testing availability.

CARB should first clearly define its objective, undertake a market readiness assessment (similar to what the CEC has done for charging infrastructure) and then evaluate *IF* market intervention is needed. As CARB acknowledged during the workshop, ISO 15118 is currently not mandated on the infrastructure side outside of public funding programs, so mandating a protocol on the vehicle is well beyond the scope of the existing frameworks. Additionally, it is our understanding that -20 is still in development due to expanding feature sets like bi-directionality. Even with MY 2026, it is premature to mandate a particular requirement in any standard while being subject to further development. In fact, -20 supports new features to come (e.g. bidirectionality and multi contract handling), features which most likely will impact reliability and interoperability. Mandating them beforehand implies an acceptance of lower reliability afterwards when conformance testing is not yet done. Rather CARB should let the industry evaluate the best pathway forward and only intervene if the market assessment indicates there is a lack of readiness.

At the same time, we agree that conformance testing of any standard can be valuable to ensure it works as planned in the field. However, prior to evaluating any sort of conformance test standard on the vehicle, additional research needs to be done to assess market challenges and needs. Rather than specifying a standard, CARB should evaluate whether conformance issues on the vehicle side are actually contributing to charging reliability or lack therefore. Additionally, instead of mandating conformance testing (without a full vetted test standard) CARB could evaluate a funding mechanism to help lower the costs for conformance and provide diagnostics on what is impacting charging event failures on vehicles.

Our recommendation is that CARB first assess the nature of issues (if any) on the vehicle side, before issuing blanket requirements regarding standard protocols and conformance testing that is not readily available today.

B. Updating Consumer-facing Vehicle Labels

In general, Tesla supports CARB's interest in updating the consumer-facing labels and encourages the agency to work with the Environmental Protection Agency (EPA) to establish the supporting range and energy consumption test methodologies for ZEVs that are more accurate, easier to test, and applicable to all ZEV platforms.

More specifically, Tesla believes CARB should explore ways to improve communication of driving range information. This should include CARB data gathering and revised testing protocols that would support meaningful new consumer information such as high-speed constant range, short/long trip range, and seasonality

[26] Staff Workshop November 15, 2023, Slides 43-45.
[27] https://www.tesla.com/ns_videos/2022-tesla-impact-report-highlights.pdf

hot/cold weather range. Critical to such an effort is separating range and efficiency testing. For example, range labelling is most critical to consumers as information for long distance travel. In a BEV, short trips consume energy differently to heat the cabin and battery, but projecting range based on the higher per mile energy consumption of short trips will incorrectly skew establishment of a BEV's total range. It will also provide inaccurate range information on one of the most important consumer BEV attributes. To address this issue, range testing/labeling should be obtained from a full-discharge test that best reflects long distance energy consumption whereas vehicle efficiency (energy consumption) should be representative of all travel including the short trips that make up the vast majority of vehicle miles travelled.

Tesla also supports CARB's investigation into ways to produce improved charge time information on vehicle labels and is aware of similar efforts under way at the Society of Automotive Engineers (SAE) J2953/4 Committee/Working Group ("Plug-in Electrical Vehicle Charge Rate Reporting and Test Procedure"). Addressing this issue will improve the customer experience and communicate information increasingly deemed invaluable to the growth of BEV adoption.[28] This effort should focus on DC Fast Charging (DCFC) that facilitates longer distance travelling where recharge time is most relevant to the BEV consumer. In establishing a uniform testing protocol for DCFC charging time, the resulting information needs to be communicated in a manner that is relatable to what consumers sees when they pay for charging such as kWh charged per interval of time (15 minutes).

IV. Existing ZEV Standards Amendments Are Needed

As CARB revisits the existing ACC II regulations, Tesla recommends that the agency address the following issues and amend the regulations accordingly.

A. Amending the NACS and Adapter Requirement

In developing the ACC II regulation, CARB included Section 1962.3 with the intent of facilitating a common BEV charging inlet and common adapter. Contrary to the regulation, manufacturers are rapidly moving away from the CCS standard toward the North American Charging Standards (NACS). Indeed, manufacturer adoption of NACS is now nearly unanimous.[29] Adoption of NACS is anticipated to yield a number of benefits related to the availability, expansion, and use of charging infrastructure.[30]

NACS is currently being standardized by SAE as J3400. This process was launched in July 2023 and in mid-December the Technical Information Report (TIR) was released.[31] The final standard is expected in mid 2024 and the standardization process will be complete well before the MY 2026 implementation of ACC II. Given the significant industry shift to NACS J3400, CARB should amend the ACC II rules to include SAE J3400 as an equally satisfactory charger inlet option for MY 2026 and subsequent vehicles. Tesla also joined a joint auto manufacturer letter that was submitted on January 15, 2024 which recommends specific modifications to the language in13 CCR §1962.3 (c).

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B. Amending the Charging Cord Supply Requirement

Similarly, CARB should amend 1962.3 (c)(3) to allow customers to opt-out of receiving a charging cord at the point of sale or allow manufacturers to offer a charging cord as an accessory. The value of mobile charging cords to customers will diminish over time as electric vehicle charging infrastructure becomes more ubiquitous at public locations and workplaces, and EV owners install charging stations at their homes. Giving customers the choice of purchasing a mobile charging cord at the point of sale will reduce the purchase price of a vehicle for owners that

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[28] See e.g., Bloomberg, Hyundai Tops Tesla in Best EVs for High-Mileage Drivers (Dec. 14. 2023) ("But choosing an EV isn't just about how far the car can drive between charges. Equally important, and often overlooked, is how quickly a battery can be replenished.")

[29] See, EV Station, Tesla NACS Charger Adoption Tracker *available at* https://evstation.com/tesla-nacs-charger-adoption-tracker/

[30] Electrek, SAE's NACS certification is ready, and it'll fix every EV charging problem at once (Dec. 15, 2023) *available at* https://electrek.co/2023/12/15/saes-nacs-certification-is-ready-and-itll-fix-every-ev-charging-problem-at-once/

[31] SAE, SAE completes next step to standardize Tesla-developed EV charging connector (Dec. 19, 2023) *available at* https://www.sae.org/news/2023/12/sae-j3400-tir-released

choose to opt-out and will reduce electronic waste in the form of unused cords. Tesla also joined a coalition letter on this topic with a number of automakers and EV charging providers that was submitted on January 16, 2024.

C. Clarifying the Level 2 Charging Cord Power Requirements

The existing §1962.3 (c)(3)(B)2 requires the charging cord to have "sufficient power to enable charging from a state of discharge to a full charge in less than 4 hours…" The plain language of the section is clear that a charger cord's capability should be the lesser of 24 amps or a full charge in less than four hours. However, the summary description of the proposed change did not reference that the capabilities should be the lesser of 24 amps or 4 hours for a full charge.[32] Instead the description stated, "Staff is proposing to add language to make clear that the required charging cord must provide sufficient power to enable charging from a state of discharge to a full charge in less than 4 hours."[33] Clarification of the intent of the section and capabilities of the charging cord are needed. Tesla recommends clarifying that the intent of the change is that the cord should have an amperage rating at the lesser of 24 amps or the amps required to charge the car from a state of discharge to a full charge in less than 4 hours on Level 2. Otherwise, the description document could be interpreted to require a 100-kWh vehicle to have a charging cord (and onboard power electronics) that is capable of charging at 25 kW of alternating current to achieve a full state of charge in 4 hours.

V. Clarifying the Standards-Based Requirements of Section 1962.5 (c)

Per the existing regulations §1962.5 (c)(2) A), in each vehicle manufacturers are required to have a Type A diagnostic connector that conforms with SAE J1962. Without further clarification, the reference to J1962 would require the connector contact pin 16 to be designated in permanent positive voltage.[34] Tesla asks CARB to clarify (or amend the regulation) that the reference to J1962 does not require permanent power voltage of this connector pin. Tesla is not aware of any need or justification for this permanent power requirement. While providing no apparent direct benefit, the permanent positive voltage requirement results in loss of battery range during extended (overnight) parking. CARB should clarify that manufacturers can make pin 16 contextually active to avoid unnecessary charge depletion when vehicles are not active for significant periods of time. More specifically, CARB should clarify that the positive voltage is only required when the vehicle is in ignition mode ON (all electronics ON but motor/engine is OFF).

VI. Conclusion

Tesla appreciates the opportunity to provide these comments on the issues presented at the November 15, 2023, Workshop, and Tesla looks forward to working collaboratively with CARB staff to address these issues.
As wit past comments, Tesla seeks to ensure that the Advanced Clean Car II program will provide faster and greater deployment of ZEVs, address the compelling and extraordinary air quality conditions in California by reducing criteria and greenhouse gas air pollutants, and protect the public health and welfare of its residents.

Respectfully submitted,

Joseph Mendelson III

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[32] See CARB, Advanced Clean Cars II, Attachment G-1, Proposed Modifications to Section 1962.3, Electric Vehicle Charging
Requirements at 1 *available at* https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/accii/attg1.pdf; Final Regulation Order for §1962.3 *available at*
https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/accii/2acciifro1962.3.pdf
[33] Id.
[34] See, SAE J1962, Section 6.3.10 "Vehicle Connector Contact 16" *available at*
https://www.sae.org/standards/content/j1962_201607/

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