July 26, 2024

SUBMITTED VIA ELECTRONIC MAIL TO cleancars@arb.ca.gov

Subject: Advanced Clean Cars II Amendments

The Alliance for Automotive Innovation (Auto Innovators) and our members appreciate the opportunity to collaborate with the California Air Resources Board (CARB) staff in the development of amendments to the Advanced Clean Cars II regulations (ACC II). Incorporating and aligning the California regulations with those of the U.S. Environmental Protection Agency's (EPA's) Multi Pollutant Emissions Standards[1] ("Tier 4" or "final rule") is critical to a successful and cost-effective program that benefits the environment and California consumers.

It is unfortunate that EPA and CARB cannot fully align regulations that govern the single tailpipe on a vehicle. It's particularly discouraging that the agencies cannot even align requirements for battery electric vehicles (BEVs) that have no tailpipe and no emissions under any possible operating mode. The end goal for both EPA and CARB is the same. The stringency of both programs is virtually the same. However, industry is left to sort out differences in program designs (i.e., fleet averages with and without zero emission vehicles (ZEVs)), testing requirements, reporting requirements, labeling requirements, and certification requirements. We will continue to work with the CARB staff to harmonize the requirements to the greatest extent possible, and our comments reflect that goal.

Beyond alignment with EPA's final rule, CARB staff identified several areas to either expand or clarify the existing ACC II regulations. Likewise, we have previously identified areas of clarity and improvement to the existing ACC II regulations below and appreciate CARB staff's work with us on these.

This letter is divided into three sections – criteria emission, zero emission vehicle (ZEV) and greenhouse gas (GHG).

---

[1] U.S. Environmental Protection Agency, Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles, 89 Fed. Reg. 27842 (April 18, 2024) (Final Rule), https://www.federalregister.gov/documents/2024/04/18/2024-06214/multi-pollutant-emissions-standards-for-model-years-2027-and-later-light-duty-and-medium-duty

1. Criteria Emission

a. Alignment with EPA Tier 4

i. Bins

Auto Innovators recommends that CARB add NMOG+NOx emission bins so that EPA bins and CARB and EPA bins are completely aligned for both light- and medium-duty vehicles (LDVs and MDVs, respectively). Emission bins have little or no environmental impact but provide manufacturers with much needed flexibility.

If CARB chooses not to include all the Tier 4 bins, we recommend at least including Bin 35 and Bin 45 in ACC II. Given the stringency of LEV IV NMOG+NOx fleet average and the decreasing number of internal combustion engine (ICE) vehicle families, these additional bins will be crucial for efficiently managing fleet emissions. For MDVs we recommend including all the light-duty vehicle bins, but at a minimum adding Bins 60 and 70.

While EPA eliminates Bin 125 and 160 for Tier 4 vehicles, these bins are still available through 2029MY for "interim Tier 4" vehicles. Auto Innovators recommends CARB harmonize with EPA's phase out of these bins. Given the stringency of the EPA and CARB standards, very few vehicles could certify to these high bins, but maintaining these bins could allow a more efficient transition.

Regardless of the additional bins in LEV IV, we support eliminating the Cleaner Federal Car provision for both light and medium-duty vehicles.[2] CARB adopted this provision in December 2000[3] when the California fleet average was more than 5 times higher (>160 mg/mile) than it is today (30 mg/mile). Twenty-five years ago, managing vehicle fleets to efficiently meet the emission requirements was relatively straightforward. That is not the case today, where:

- EPA and CARB fleet average standards are extremely low.

---

[2] See Title 13, California Code of Regulations, §1961.4(c)(6)

[3] See ISOR, retrieved from https://ww2.arb.ca.gov/sites/default/files/barcu/regact/mdv-hdge/isor.pdf on June 28, 2024. Also see Hearing Information retrieved from https://www.arb.ca.gov/regact/mdv-hdge/mdv-hdge.htm on June 28, 2024.

- The number of ICE vehicle families will quickly dwindle under CARB's ZEV regulations further limiting a manufacturer's ability to manage its fleet.
- EPA includes ZEVs in its fleet average, whereas CARB does not.
- CARB and EPA eliminate several bins at different times.

Managing vehicle fleets and fleet averages will be extraordinarily difficult even without this provision and nearly impossible with it. The California fleet average standards do not include ZEVs or electric vehicle operation so higher emitting ICE vehicles would need to be offset with lower emitting ICE vehicles. We agree with CARB staff that the 30 mg/mile LEV IV fleet average reduces (or eliminates) the risk of certifying to dirtier bin. Moreover, eliminating the Cleaner Federal Vehicle provision will have no environmental impact.

ii. PM Standards

While we supported the PM standards CARB adopted in ACC II, we understand that CARB plans to harmonize with EPA's PM Standards for 25°C FTP and the US06 drive cycles for 2030 and subsequent model years (MY). For MDVs this should not start until 2031MY to align with EPA default path.

For small-volume manufacturers (SVMs), we recommend CARB harmonize with EPA's provision that allows SVMs to meet the 0.5 mg/mile PM standards in 100% of their vehicles starting in 2032 MY.

iii. CO Emission Standards

Although not mentioned in the June 26th ACC II Workshop, EPA revised the CO standards in the Tier 4 exhaust standards to establish a CO emission cap of 1.7 g/mile for the FTP, HFET, and SC03 rather than lowering the 25°C FTP standard to 1.0 g/mile for Bin 30 and lower as it is in Tier 3 and LEV IV. EPA explained,

> *The 1.7 g/mile CO cap for the 25°C FTP is less stringent than the Tier 3 25°C FTP bin specific standard for Bin 20 and Bin 30, but overall, the 1.7 g/mile CO cap is somewhat more stringent than Tier 3 because it applies to three cycles instead of one, and because it is more stringent than the Tier 3 25°C FTP bin specific standard for Bin 125 and Bin 160.*

We recommend CARB harmonize with EPA's CO standards and similarly adjust associated 50°F FTP and SC03 CO for Bin 30 and lower bins. California is and has been in attainment for CO (both federal and state standards) for over a decade.

Moreover, CO emissions from ICE vehicles continue to decline and will decline further and faster with the introduction of more ZEVs under the ZEV regulations.

iv. High-Altitude Standards

In the workshop, CARB staff requested input on "amendments to high-altitude standards that balance test burden and protecting for emissions controls in real-world driving conditions." The current regulations specify high-altitude standards that must be met under high-altitude conditions[4] and therefore require testing at high altitude for the US06, 50F FTP, and SC03 drive cycles.

In the past, neither CARB nor EPA required high altitude testing over these drive cycles. In fact, CARB's ACC II 45-Day notice issued April 12, 2022, specifically excluded these drive cycles from high altitude requirements. While updating the regulatory language for clarity, CARB inadvertently added high-altitude standards for US06, SC03, and 50F FTP during the 15-Day Notice. We appreciate CARB staff's work to address the early 2025 model year (MY) and 2026MY LEV IV vehicles, and their commitment to work with industry during this rulemaking to better understand the costs and benefits associated with high-altitude testing.

EPA specifically excluded US06 and SC03 drive cycles from high-altitude requirements in its rulemaking completed just this year and has never set 50F standards. Consequently, the high-altitude standards for US06, SC03, and 50F would be unique to California vehicles. These standards will impose substantial cost not only because test facilities would need to be developed, built, certified, and maintained, but also because vehicle emission systems and/or engine combustion systems would need to be completely redesigned to meet some of the requirements at high altitude. This would happen at the same time as CARB is mandating (through its ZEV regulation) the elimination of ICE vehicles.

Auto Innovators is surveying its members to develop a cost for both facilities and vehicle emission control system and/or engine system redesign. We plan to provide this information to CARB Staff in separate correspondence in September.

---

[4] "High-Altitude conditions" means a test at an altitude of 1,620 meters 5,315 feet, plus or minus 100 meters (328 feet).

The benefits of any high-altitude standards for US06, SC03, and 50F are minimal. First, the US06 and SC03 drive cycles represent a tiny fraction of total driving (e.g., CARB, EPA, and industry instrumented-vehicle data found that less than 13 percent of all driving occurs outside of the FTP envelop, and operation on the US06 and SC03 would be far lower still[5]). Second, only a small portion of California's vehicle population operates at altitudes above 5,000 feet, and those areas are not ozone non-attainment areas. Finally, the 50F test was developed to control emissions during the morning low temperatures of Southern California summers. The 50F test was never intended for mountain areas with much different diurnal temperature profiles and no ozone non-attainment areas.

In summary, these standards that were inadvertently added will add substantial costs for little or no benefit. We recommend harmonizing the ACC II LEV IV regulations with the EPA Tier 4 regulations and eliminating high altitude standards for US06, SC03, and 50F.

b. Evaporative Emissions

Auto Innovators understands CARB staff will update the evaporative emission regulations to require on-board refueling vapor recovery (ORVR) on all MDV and HDV incomplete gasoline vehicles by 2030MY for MDVs and 2027MY for HDVs. We appreciate CARB staff's work to harmonize the test requirements to allow an extra FTP drive cycle for MDVs with fuel tank capacity over 50 gallons. We support these changes.

We also support extending the NIRCOS preconditioning procedure to all vehicles with non-integrated evaporative systems.

Finally, EPA finalized new light-duty truck and MDPV definitions as part of Tier 4 that will increase stringency of 2-3 day SHED plus hot soak emissions requirements on some vehicles. If CARB plans to adopt these new vehicle definitions, we request CARB adopt the same carryover provisions through 2031MY per §86.1813-17(a)(2)(iv) and (v).

[5] Environmental Protection Agency (EPA). Notice of proposed rulemaking for revisions to the Federal Test Procedure for Emissions from Motor Vehicles. Federal Register, vol. 60, no. 25, 1995, pp. 7404-7421, https://www.govinfo.gov/content/pkg/FR-1995-02-07/pdf/95-2833.pdf

c. Quick Drive Away

During the 2022 ACC II rulemaking, Auto Innovators recommended adding a speed tolerance of 0.3 miles/hour for the first 7 seconds of the quick drive off test. This would ensure the vehicle is fully stopped during the shift and avoid transients. We noted that 0.3 miles/hour is within the typical tolerance of dynamometers. CARB did not find a precedent for the tighter speed tolerance and did not accept our recommendation.

After CARB's ACC II rulemaking, EPA adopted the Quick Drive Away standards in their recently adopted Tier 4 final rule. In doing so, EPA is finalized that vehicle speed may not exceed 0.0 mph until 7.0 seconds and vehicle speed between 7.0 and 7.9 seconds may not exceed 2.0 mph. This reduces the possibility of a test driver driving off significantly earlier than 8 seconds without setting unrealistic requirements on the test driver and doesn't significantly skew the trace to drive-off times larger than 8 seconds. The following table from EPA's final rule illustrates the tighter speed tolerance for Quick Drive Away[6]

Table 55: Tighter speed tolerance for early driveaway test

Time (s)	Trace speed (mph)	Min/max speed in regular FTP (mph)	Min/max speed in early driveaway with tighter tolerances (mph)
6.0	0.0	0.0-2.0	0.0
7.0	0.0	0.0-5.0	0.0-2.0
8.0	3.0	0.0-7.9	0.0-7.9
9.0	5.9	1.0-10.6	1.0-10.6

We request that CARB harmonize with EPA's speed tolerance for the Quick Drive Away test.

Additionally, the original quick drive-away test procedure in the draft ACC II language was specified to be run as a single FTP with only drive trace in phase 1 modified where the first idle period at the start of the test is shortened from 20 to 8 seconds. However, the final ACC II document specifies that we must run two separate tests to satisfy the Quick Drive-Away requirements: a cold start 505 test coupled with a standard 3 bag FTP for ICE or a cold start UDDS coupled to a standard 4–bag FTP for HEV/PHEV. This adds a

[6] Environmental Protection Agency [EPA]. (2024, April 18). Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles. Federal Register, 89(76), 27842-27872. https://www.federalregister.gov/documents/2023/05/05/2023-07974/multi-pollutant-emissions-standards-for-model-years-2027-and-later-light-duty-and-medium-duty

burden for the test automation to combine results from two separate tests, which is costly and cumbersome and will take time to implement by test automation systems.

We recommend adding the original Draft ACC II language to allow manufacturers the option of running a single FTP with only the drive trace in phase 1 modified with the first idle period shortened from 20 to 8 seconds.

d. MDV Specific Concerns

In the context of the EPA Tier 4 final rule, EPA describes "Medium Duty Vehicles" (MDVs) as large pickups and vans with a gross vehicle weight rating (GVWR) of 8,501 to 14,000 pounds and excludes vehicles used primarily as passenger vehicles (which are called medium-duty passenger vehicles, or MDPVs, and which are covered under the light-duty program).[7] As part of the EPA Tier 4 final rule, EPA updated test procedures and criteria emissions for MDVs.

Auto Innovators recommends that CARB update LEV IV test procedures (including additional engine dyno certification options) and standards to align with EPA so that manufacturers can 50-state certify products with one set of test procedures and outstanding emissions performance to comply with Federal and State programs.

i. MDV segment background and powertrains

MDVs are often used to do work, and customers frequently demand high functionality for towing and hauling from MDV pickups and vans. Gasoline and diesel powertrains are common in MDVs today, and many of these powertrains also appear in incomplete Class 2b-3 vehicles, and Class 4 and above vehicles, which may be subject to other regulations. For instance, a powertrain appearing in the MDV segment in MY 2027+, after all applications are considered, may have applications subject to EPA HD Engine criteria emissions regulations,[8] CARB Low NOx Omnibus

[7] Federal Register Vol. 89, No. 76, Thursday, April 18, 2024, 27853, https://www.govinfo.gov/content/pkg/FR-2024-04-18/pdf/2024-06214.pdf

[8] EPA Final Rule and Related Materials for Control of Air Pollution from New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards (December 2022), https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-and-related-materials-control-air-pollution

regulations (amendments pending),[9] EPA Tier 4 Medium Duty Vehicle criteria emissions standards (including corrections) which refer extensively to EPA HD Engine criteria emissions regulations,[10] CARB LEV IV criteria emissions standards (amendments under consideration, per this notice and comment period), and CARB Advanced Clean Trucks rule (amendments pending).[11]

These regulations include a range of test procedures, warranties and useful life for equipment, on-board diagnostic requirements, and reporting requirements that are not necessarily harmonized, which can create duplicative work and confusing, misaligned requirements.

ZEV technologies in the MDV segment, when sized to address customer requirements for towing range and payload, often increase the curb weight of MDVs considerably. As the internal combustion engine powertrains common in MDVs today are replaced with PHEV and ZEV powertrains, regulators should consider that the additional weight of the equipment may increase the GVWR of the vehicle over 14,000 lbs., changing the regulatory class of the vehicle and making the vehicle subject to different regulations.

To help streamline requirements for capable vehicles, CARB and vehicle manufacturers agreed to the Clean Trucks Partnership agreement.[12] The agreement commits to harmonized in-use test procedures for CARB and Federal regulations, which is important to provide manufacturers a pathway for 50-state certification.

---

[9] CARB Heavy-Duty Engine and Vehicle Omnibus Regulations and Associated Amendment (December 2021), https://ww2.arb.ca.gov/rulemaking/2020/hdomnibuslownox

[10] EPA Final Rule: Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles (July 2024), https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-multi-pollutant-emissions-standards-model

[11] CARB Advanced Clean Trucks Amendments (March 2024), https://ww2.arb.ca.gov/rulemaking/2024/advancedcleantrucks

[12] Clean Trucks Partnership agreement announcement between CARB and nation's leading truck manufacturers (July 2023), https://ww2.arb.ca.gov/news/carb-and-truck-and-engine-manufacturers-announce-unprecedented-partnership-meet-clean-air

ii. MDV Bins

CARB has proposed to eliminate flexibilities in bin structure earlier than EPA – the EPA multipollutant rule allows for Tier 3 and transitional Tier 4 bins to be used through MY2030 (bin 175 and 150 for Class 3 vehicles and bin 125, 100, 85, and 75 for all medium-duty vehicles). CARB should allow for the use of bin 175 until MY2031 to better align structures between the two programs.

CARB should also allow manufacturers of MDVs to use lower LDV bins, rather than setting a floor at bin 75. At minimum, CARB should expand access to bins 60, 65, and 70 for MDV. CARB should not cut off medium-duty vehicles from accessing lower bins, there is no emissions benefit to limiting this flexibility.

The Cleaner Car provision should also be eliminated for medium-duty vehicles if bin structures are not aligned between the California and Federal programs.

iii. Timing of EPA Tier 4

In the CARB amendments workshop and workshop presentation,[13] CARB incorrectly states that portions of the EPA MDV Tier 4 requirements begin in MY2030. The EPA MDV Tier 4 requirements begin in MY2031. However, for automakers choosing the optional early compliance path, EPA does offer manufacturers the flexibility to use Tier 4 bins and test procedures prior to MY2031 at the manufacturer's option. Auto Innovators recommends that CARB align LEV IV timing for additional requirements with EPA Tier 4 timing (i.e., MY2031), and that CARB include flexibilities for manufacturers to optionally certify to MY2031 requirements early.

CARB requested comment on proposed CA MDV Fleet Average Standards (workshop slide 19) and if CARB should combine Class 2b and 3 standards in MY2030. Auto Innovators recommends that CARB maintain current MDV LEV IV standards through MY2030, and that any changes would be first included in MY2031.

[13] CARB ACC II / LEV IV amendments workshop presentation (June 26, 2024), https://ww2.arb.ca.gov/sites/default/files/2024-06/2024_06_26_ACC%20II%20Amendments%20Workshop%20Presentation_ADA.pdf

iv. MDV NMOG+NOx Fleet Average

Both existing California and Federal NMOG+NOx fleet average standards require similar levels of emissions controls. To maintain commonality between the amendments to the LDV and MDV programs, CARB should not adjust the NMOG+NOx fleet averages.

CARB's stated goal during the June 26th workshop was to achieve equivalent stringency in NMOG+NOx fleet averages between California and Federal standards. However, differences between the set-up of CARB ACC II and the recently finalized EPA Multipollutant Rule make it challenging to compare stringency between the two programs. EPA retains ZEVs in the fleet averages, whereas CARB removes ZEVs from fleet average calculations. Further hindering the ability to compare the two programs is the way that EPA considers high gross combined weight rating (GCWR) vehicles – medium-duty vehicles under 14,000lb GVWR with a GCWR above 22,000lb have the optional pathway to engine certify to heavy duty standards and would not be included in NMOG+NOx fleet averages. This complicates direct comparison between the two standards, and it was not clear if this was considered during the ACC II amendment workshop presentation.

Existing fleet average standards have been the plan of action for development for the past three years since CARB began development of the ACC II standards. Increased development costs for medium-duty ICE vehicles and regulatory uncertainty in the medium-duty segment hinders the ability for manufacturers to provide quality vehicles to serve the California market. Medium-duty vehicles comprise a smaller segment of vehicles than their light-duty counterparts – with fewer vehicles sold and less carlines to spread out development costs for modified standards.

With these factors (i.e., treatment of higher weight vehicles, differences in the way heavier MDVs are utilized, treatment of ZEVs in fleet averages) in mind, adjustments to existing CARB MDV NMOG+NOX standards are unnecessary.

If CARB decides to proceed with adjusting the fleet averages, consideration should be taken in the timing of the phase-in. In the final EPA Multipollutant Rule, EPA's default compliance pathway (which CARB seems to have used as the basis for their proposed modifications) begins with MY2031. In the June 26th update workshop, CARB showed modification to the fleet averages beginning with MY2030, which appears to reflect the original timing of the default compliance pathways found in

the draft phase of the Multipollutant Rule. If CARB's goal is to achieve equivalent levels of stringency as EPA's program, the phase-in of requirements should align and begin no sooner than MY2031.

v. MDV US06 Test Cycle

CARB proposed during the June 26th workshop to require a full US06 drive cycle for MDV beginning in MY2030, removing flexibilities for low power to weight ratio Class 2b vehicles and Class 3 vehicles. CARB states this will simplify certification requirements and align with EPA. However, EPA's requirement for a full US06 begins with Tier 4 certification. Under the default compliance pathway under the EPA provisions, manufacturers could begin to certify Tier 4 MDV in MY 2031.

To simplify compliance between state and Federal programs, CARB should extend this flexibility to align with EPA's provisions and allow the LA92 and US06 bag 2 flexibility for Class 3 and Class 2b vehicles respectively until MY2031 and allow for early compliance beginning with MY2027.

vi. Chassis and Engine Dynamometer Testing

EPA provides manufacturers the option to certify vehicles over 22,000 pounds GCWR using engine dynamometer testing, and to certify against the EPA HD Engine standards finalized in December 2022. Vehicles certifying to this option would not be subject to the 0.5 mg/mile chassis certification particulate matter standards, nor would they be included in the 75 mg/mile NMOG+NOx Federal fleet averaging set for chassis certification, but the equipment would be subject to the stringent EPA HD Engine standards. This flexibility to certify with engine dynamometer testing is important for MDV manufacturers to streamline powertrain and vehicle certification across regulatory classes.

On slide 24 of the workshop presentation, CARB does not propose to offer the engine certification pathway for most vehicles in the MDV averaging set, and this is an important, and substantial disconnect from the EPA program. Auto Innovators encourages CARB to allow manufacturers to use any Federal test procedures allowed in the Federal regulations to certify equipment to California standards. Auto Innovators encourages California to:

- Provide a CARB LEV IV pathway for Class 2b vehicles to engine dyno certify, consistent with Federal standards.

- Align CARB LEV IV Class 3 diesel engine dyno certification requirements, including useful life, warranty, and deterioration factors with EPA HD Engine.
- Align CARB LEV IV in use testing for MDVs with the Clean Trucks Partnership.

Additionally, CARB includes high load chassis test cycles (i.e., US06) in the MDV regulation, and laboratory facilities will require investments to test Class 3 vehicles at high loads to certify to the CARB proposal.

vii. Portable Emissions Measurement Systems (PEMs)

We recognize the importance of in-use testing, but we think it is critical to align with EPA's timing. Furthermore, EPA HD Engine, original CARB LEV IV, and CARB Low NOx Omnibus all include different procedures for PEMs testing. Efforts are ongoing through the Clean Trucks Partnership to better align the programs. Auto Innovators agrees with CARB's proposal to align PEMs test procedures as outlined in the Clean Trucks Partnership agreement and recommend delaying this requirement until 2031MY to align with EPA's Tier 4 default path MDV / PEMS timing. Note that in the Clean Truck Partnership agreement, CARB agreed to align with EPA's HD Engine rule (i.e., remove gas SI PEMS and base diesel PEMS on EPA 2-Bin MAW).

viii. MDPV Definition

CARB's stated intent is to fully align with the recently updated EPA definitions of a medium-duty passenger vehicle (MDPV). In EPA's final rule, specific language was added to 40 CFR §86.1803-01 to clarify that cargo vans are not MDPV:

> (2) Starting with model year 2027, or earlier at the manufacturer's discretion, Medium-duty passenger vehicle means any heavy-duty vehicle subject to standards under this subpart that is designed primarily for the transportation of persons, with seating rearward of the driver, except that the MDPV definition does not include any vehicle that has any of the following characteristics:

...

> (vi) Is a van in a configuration with greater cargo-carrying volume than passenger-carrying volume at the point of first retail sale. Determine cargo-carrying volume accounting for any installed second-row seating, even if the manufacturer has not described that as an available feature.

This change is appropriate and necessary to account for the unique characteristics and use cases of cargo vans. CARB's concern with existing definitions is that as manufacturers electrify existing offerings of vehicles designed primarily for

transportation of passengers, the new weight of the battery packs would increase the vehicle's GVWR pushing them into the medium-duty category and changing their emissions classification from light-duty standards. The expressed concern does not align with the use case for cargo vans which are primarily work vehicles with unique characteristics that differentiate them from their light-duty counterparts (larger cargo-carrying volume than passenger-carrying volume).

The examples CARB presented during the workshop focus on one segment impacted by electrification of the MDV segment, but it is important to ensure that it is CARB's intent to adopt the full EPA definition including provisions related to cargo vans as seen above.

CARB should align fully with EPA definitions and timing (do not introduce modifications to the definition for criteria emissions purposes before MY2031) to provide regulatory clarity between the two programs (CARB ACC II vs EPA MPR).

e. Industry recommended updates to ACC II Criteria

Auto Innovators provided other recommended changes to the quick drive-off test, PHEV high power cold start in our letter of January 15, 2024.

2. ZEV Requirements

a. CARB Proposed Changes

i. Environmental Performance Label (EPL)

While we agree the existing Federal Fuel Economy and Environmental label is of limited value for battery electric vehicles (BEVs), which have no emissions and consume no fuel, we are concerned about an additional California-only EPL that would be applied to BEVs in California and the Section 177 states following California (S177 states).

Instead of a new EPL, CARB and EPA should work with other stakeholders to develop new label requirements that can be implemented on the Monroney label in all 50-States. We are encouraged by the Mobile Source Technical Review Subcommittee (MSTRS) starting an "EV Testing/Labeling" workgroup to address consumer information for BEVs. Auto Innovators and our members will actively support this effort. The timeline appears to align with ACC II Amendments rulemaking, which

could allow new information on the Monroney Label, consistent with current practice, rather than a separate California label.

At the workshop, CARB outlined potential label information, including:

- DC Charge rate (using SAE J2953/4*) in miles added per 10 minutes.
- AC Charge rate (using SAE J2953/4*) in miles added per hour.
- A new range using an updated SAE J1634 that includes a range at high-speed (e.g., 65 steady state) driving.

** Note: The SAE committee had planned to continue the SAE J2953/4 standard as a U.S. standard. However, with the joint ISO/SAE J12906 standard ready for publication, the SAE committee has decided to stop work and cancel SAE J2953/4. The SAE J12906 standard will still be maintained by the SAE committee. CARB should plan to reference the new SAE J12906 standard.*

We appreciate that CARB is working with SAE committees to develop both the metrics and the testing protocols. SAE has decades of experience developing metrics and test procedures to ensure consistent determination of those metrics across vehicles and manufacturers.

While the information proposed in the workshop seems reasonable, we prefer to withhold our recommendation while continuing to work with CARB, EPA, MSTRS electric vehicle (EV) Testing/Label workgroup to define the most informative data to be used in a revised Monroney label.

ii. EV Charging and Interoperability standards

The workshop included a proposal to require all 2028MY and subsequent BEVs and fast charge capable plug-in hybrid electric vehicles (PHEVs) implement DIN SPEC 70121 and ISO 15118-2, the latter with the Plug and Charge Feature. Additionally, CARB proposes to require a conformance test to the DIN and ISO standard at the time of certification. While we appreciate the need to address concerns with interoperability, there are several efforts underway through various groups, all aimed at addressing this issue. It is questionable that CARB needs to adopt requirements if this is the direction the entire industry is going.

Nonetheless, based on CARB's current thinking, Auto Innovators' members are committed to working with CARB Staff through the SAE process to identify the

specific features in the DIN SPEC 70121 and ISO 15118-2 that should be included, and the associated conformance test that would appropriately verify those features are properly implemented. SAE J2953/3 is being completed for the initial Interoperability requirements and will also include DIN 70122 plus CharIN conformance requirement updates, in the initial publication. ISO 15118 Conformance summary will be added when this is reopened in 2025 to also include additional updates for Interoperability. To the extent CARB considers conformance test requirements, automakers should self-certify to those requirements.

Finally, we recommend limiting this requirement to BEVs and not requiring it on fast-charge capable PHEVs. The requirement will add certification burden and costs, which could discourage the inclusion of fast-charging capabilities on PHEVs.

b. Industry recommended updates to ACC II ZEV

i. ZEV Durability

The ACC II ZEV battery durability requirements could require 100s of hours of additional testing not only at the time of certification, but also during in-use testing. In fact, as currently structured, the certification range testing could delay launch of some BEVs while manufacturers run additional tests on multiple subconfigurations with range differences well below 10 percent of total range (e.g., a variant with a 310-mile range and another variant with a 305-mile range). This additional testing and jeopardy do not provide consumer assurance – the ACC II BEV battery warranty provisions already provide this – but simply adds cost and complexity to BEVs that do not and cannot emit any pollution.

This past April, EPA finalized an allowance for manufacturers to choose between the durability requirements in the April 2024 EPA final rule or those in the CARB ACC II regulations. EPA noted that it "considers the CARB durability program, when viewed in its entirety with its metrics and performance requirements, to be no less effective than the EPA durability program. Accordingly, EPA will accept manufacturer compliance with the entirety of the CARB ACC II durability program in lieu of the EPA durability program."

Auto Innovators recommends that CARB offer reciprocity to the EPA BEV durability requirements and "accept manufacturer compliance with the entirety of the EPA durability program in lieu of the CARB ACC II durability program." This would

eliminate the excessive testing without impacting consumer protections which, again, are provided by the BEV battery warranty.

Auto Innovators also notes that CARB and EPA should align on battery health. EPA uses State of Certified Energy (SOCE), whereas CARB uses State of Health (SOH). Two metrics for battery health is unnecessary and will certainly confuse customers.

ii. SAE J3400 Port

Every automaker has announced plans to transition from the SAE J1772 to the SAE J3400 vehicle port over the next several years.

Given the automaker announcements, the Federal Highway Administration (FHWA) is currently considering modifying the federal minimum standards for EV charging infrastructure deployed as part of the National Electric Vehicle Infrastructure (NEVI) program. Automakers recommended FHWA allow either the SAE J3400 or the CCS Type 1 connectors for NEVI funded fast-chargers in response to a FHWA request for information.[14]

With J3400 standardization well underway and the auto industry moving toward universal adoption, CARB should amend the now obsolete requirement that all vehicles manufactured on or after MY 2026 to be equipped with a CCS Direct Current (DC) inlet or to provide a CCS adapter.[15] If the current requirement maintained, 99% of the EV market would be required to supply a CCS adapter, adding additional and unnecessary cost to the vehicle, even for drivers that may not want or need an adapter. It is clear this requirement is contrary to current market trends and could lead to stranded assets for industry and increased costs for outdated equipment for consumers.

The charging regulation requirement to supply an adapter for vehicles equipped with a non-SAE J1772 AC port could also impede the transition, particularly for PHEVs that

---

[14] Joint Automakers Letter (2024, April 5). Request for Information on the J3400 Connector and Potential Options for Performance-Based Charging Standards [Docket No. FHWA-2023-0054]. Retrieved on July 15, 2024, from https://www.autosinnovate.org/posts/agency-comments/energy-environment/Joint%20Automakers_NACS%20Connector_FHWA-2023-0054-0099.pdf

[15] Title 13, California Code of Regulations, § 1962.3.

typically only use an AC charger. The charging regulations in 13 CCR §1962.3 require any vehicle not equipped with an SAE J1772 port to include an adapter to convert from an SAE 1772 connector to the port on the vehicle for both AC and DC charging (if equipped). These adapters add costs to the vehicle yet provide little value to the customer. In fact, automakers that once included adapters in new EVs have stopped doing so without any impact on either customer satisfaction or sales. The AC adapter requirement could thus impede the transition to SAE J3400 as automakers choose to avoid the added cost of an adapter.

To expedite the transition, Auto Innovators recommends that CARB modify 13 CCR §1962.3 to include SAE J3400 as an equally satisfactory charging port option.

iii. Previous Comments:

In our January 15, 2024, letter, we included recommendations on the State of Health (SOH) Metric and display alignment, virtual mileage for battery warranty and durability, adapter requirements for EV charging regulations, certification range-durability requirements, battery label requirements, and environmental performance label.

3. GHG Regulations

Auto Innovators recommends CARB ensure any GHG regulations meet the following two guiding principles:

1) The California GHG regulations should not require different ICE technology than required by the EPA regulations. Automakers simply do not have the resources to both electrify 100 percent of their fleet while at the same time redesigning ICE vehicles for the California market.

2) Independent of the standards, the California GHG regulations should align with EPA's certification requirements, test procedures, and data reporting requirements. Automakers should test their vehicles for EPA, and unless there is a unique California vehicle, submit that same data to CARB for certification. Differing requirements will complicate certification and compliance and provide no environmental benefit.

At the workshop, CARB staff asked, "What policy design best supports California's GHG goals." As noted in our previous comments, Auto Innovators does not believe that additional GHG regulations to backstop the ZEV mandate are necessary. California's GHG goals are already fully addressed through the ACC II ZEV mandate, which requires 100

percent ZEVs by MY2035 with up to 20 percent PHEVs. EPA's recently adopted GHG regulations are 50-state, so any improvement in California and the other S177 states (or difference in vehicles delivered because of the ZEV mandate) would not change U.S. GHG emissions.

The Biden Administration worked to align the stringency of recently finalized GHG standards, CAFE standards, and Petroleum Equivalency Factor regulations. In prioritizing the transformation of the U.S. fleet to electric vehicles, the Biden Administration avoided requirements that would divert the finite resources of manufacturers to a dwindling market share of ICE vehicles, which are already approaching the feasible limits of CO2 reductions and efficiency gains. California shares the Biden Administrations goal of transforming to an electric vehicle fleet as soon as possible. The California GHG regulations should not undermine these shared objectives.

Auto Innovators recommends CARB adopt the EPA GHG regulations finalized June 17, 2024.[16] Alternatively, CARB could adopt the EPA GHG regulations in whole in its regulations for consistency. This approach provides a backstop to ensure that future changes to the EPA regulations would not affect the California program and would be the most appropriate, efficient, and cost-effective approach to California's GHG regulations.

Given the complexity of setting GHG standards that differ from EPA's GHG standards, compared to the other amendments, Auto Innovators would support moving forward with other ACC II amendments while continuing to work with CARB staff to develop appropriate GHG standards for approval at a later hearing.

a. GHG – Backsliding Risk

Instead of adopting the EPA GHG regulation, CARB proposed a GHG fleet average emission standard for combustion engine operations. That is, only ICE vehicles and the non-electric operation of PHEVs (i.e., charge sustaining (CS)). A motivating factor noted by CARB Staff is that a GHG fleet averaging combined with increasing ZEV sales could create "ICE Backsliding Risk." At the June 26th workshop, slide 35 depicts a trajectory a backsliding that we believe would be impossible for manufacturers to replicate. Any backsliding attempt would count against the Federal GHG standards for which there will be negligible compliance margin by

[16] To the extent EPA finds it necessary to make minor technical corrections to this rule, CARB should accept such subsequent versions also.

the 2030MY. Auto Innovators believes the risk of backsliding does not exist for the following reasons:

- **Fleet vs Vehicle Backsliding**: First, we should distinguish between fleet back sliding and vehicle backsliding. GHG emissions are a global concern, and the focus should be on reducing the global emissions which are measured by fleet GHG emissions. By every measure, CARB's ZEV regulations will accomplish this goal of reducing vehicle GHG emissions. In the context of global emissions, individual vehicle backsliding is meaningless. Yes, some vehicles will have higher emissions than others, but the environmental impact is determined by the entire fleet of vehicles.

- **Backsliding Associated with EV Sales Increases**: ZEV sales have increased quickly for the past several years – going from under 1% nationally in 2016 to over 10% in 2023. In fact, CARB pointed to the rapid EV sales growth to dramatically increase the ZEV sales requirements in ACC II. Yet, in the face of a ten-fold increase in ZEV market share, there is no evidence of ICE backsliding during the past seven years. Manufacturers have not recalibrated vehicles for better performance at the cost of higher GHG emissions. Moreover, the extraordinarily challenging federal GHG and criteria standards combined with California's ZEV mandate and ICE-only criteria emission standards, require manufacturers to focus on emission reductions across the board, and to the extent additional GHG emission reductions can be achieved through electrification, manufacturers are unlikely to squander gains but instead bank them to comply with the ever more stringent GHG standards.

- **Conversion of Lower-Emitting Models to ZEV**: CARB identified conversion of relatively lower-emitting models to ZEV platforms under the "ICE Backsliding;" however, this is not backsliding but rather product planning for compliance. Automakers must develop product plans that comply with six different sets of regulations (CA's GHG, ZEV, and Criteria regulations, EPA's GHG and criteria regulations, and NHTSA's CAFE regulations). The resources required to meet all these requirements mean vehicles must provide benefits in all categories (GHG, criteria, and ZEV). Some manufacturers will opt to electrify smaller vehicles, others larger vehicles, still others a mix of both vehicles to follow the demand of their customers. CARB should not attempt to regulate vehicle product plans or develop regulations that attempt to steer product plans beyond those already being driven by the ZEV mandate.

- **Recalibration for Performance**: Auto Innovators does not believe manufacturers can or will recalibrate vehicles to focus on performance rather than emission reductions. Generalizing, vehicles are already designed to maximize performance while meeting GHG and criteria emission requirements. Strategies to increase power over reducing GHG emissions (for example, applying a turbocharger without engine downsizing) go far beyond simple calibration changes. Potential "calibration changes" are generally constrained by criteria emission control design and certification requirements. In addition, even if such calibration changes are conceivable, such actions require significant development, testing, and certification efforts to be undertaken while manufacturers are also turning investments toward a transition to electric vehicles.

- **Technologies to Further Reduce Emissions**: We agree that light-weighting, advanced engine technologies, and hybridization can all reduce GHG emissions. However, these technologies are already being deployed in current and planned ICE vehicles and their deployment will need to be further accelerated to meet EPA's GHG regulations. Hybrid production and sales are increasing, but this technology requires a complete redesign of the vehicle powertrain system, and such large investments must be balanced against investments in electrification, particularly as the share of non-ZEV vehicles – including hybrids – must decline.

b. ICE-Only Fleet Average Complexities

Auto Innovators recommends CARB adopt EPA's standards (both the form and the values). An ICE-only fleet average is both difficult to develop and rife with risks, including:

i. Stranded Investment

- Moving toward a 100% HEV ICE average in California in 2030-2034 would effectively be asking manufacturers to invest significant resources in a technology that won't even be allowed in California and 35-40 percent of the U.S. market (considering S177 states) after 2034. Powertrain investments are typically amortized over 10-15 years[17] – CARB would be asking manufacturers to

[17] Center for Automotive Research [CAR]. (2017, September 20). Automotive product development cycles and the need for balance with the regulatory environment. Retrieved from https://www.cargroup.org/publications/automotive-product-development-cycles-and-the-need-for-balance-with-the-regulatory-environment/

somehow recoup those investments in a period as short as five years. This may lead to excessive cost or excessive mix-shifting as noted below. While manufacturers should be able to use HEV technologies to support compliance with federal and California GHG standards, they should not be required to do so if their preference is the production of electric vehicles or other technologies.

- Because BEVs do not help the ICE-only fleet average, if CARB chooses a declining fleet average, it effectively requires manufacturers who might plan to invest only in BEVs to also invest in HEVs and/or PHEVs while they attempt to make the transition to only ZEVs. This not only strands investment on the HEV/PHEV side, but also diverts resources from the ZEV transition side.

ii. Excessive Mix-Shifting

- An ICE-only standard could reduce the pace of electrification at the national level because it would effectively require a lower ICE GHG emission rate at the national level in addition to California and Section 177 states. That lower ICE GHG emission level would in turn reduce the need for electrification at the national level. This could lead to vastly different vehicle technology requirements in different areas of the country (S177 states vs non-S177 states), and consequentially excessive mix-shifting, which might include the elimination or severe restrictions of vehicle models in some markets as automakers attempt to comply with the substantially different technology requirements.

iii. Unnecessary with Existing Stringency

- The ACC II ZEV Mandate already requires automakers to quickly move their remaining (and quickly diminishing) ICE fleet to 100% PHEVs by MY2035.

- Staff should recognize that today's GHG standards are already generally beyond the capabilities of conventional ICE vehicles and are generally being met through the addition of EVs to the fleet to balance out the higher emissions of ICE vehicles.

- In every case, the fleet GHG emissions in California will be dramatically lower. Requirements that further restrict vehicle choice in the state could ultimately harm California's economy and consumers.

iv. PHEV – Exclusion of EV operation from the GHG Fleet Average

- PHEVs are an important technological bridge to a full ZEV future, and in some use cases (e.g., towing) it may be the only electrified option for customers. Counting PHEV vehicle GHG from ICE operation serves to punish the vehicle's performance vs a non-plug-in hybrid due to the added weight of batteries, on-board charger, and the added vehicle structure to support heavy batteries. The superior GHG performance of a PHEV must be recognized.

- Eliminating PHEV electric operation from a manufacturers fleet GHG determination could alter the automakers product development decisions. In developing product plans to meet the GHG standards, manufacturers could be choosing between a PHEV and HEV. A PHEV will have higher cost and weight (leading to higher GHG emissions) compared to a HEV. By ignoring the electric operation, CARB will falsely tilt the scales in favor of the HEV. Thus, rather than choosing to build a highly capable PHEV that meets California's MY2035 requirements, it may simply convert a conventional ICE to a conventional HEV.

- Across the fleet, PHEVs (especially those that meet California's ACC II ZEV requirements) will be driven in electric mode to some extent. CARB should recognize the GHG benefits of such electric operation.

- Automakers are interested in engaging with SAE, EPA, and CARB on PHEV utility factors, including expanding understanding of CARB's workshop presentation and the impact of charging on that data. Charging behavior should be examined both in the current environment with largely inadequate public and home charging infrastructure (particularly for low-income drivers), and in a future environment when, hopefully, public and home charging will be sufficient to allow drivers at all income levels to access convenient, reliable, low-cost charging. We urge California to take a forward-looking approach to e-VMT, seeking to understand the potential behaviors of future longer-range PHEVs and adequate charging as opposed to focusing on the relatively lower-range PHEVs of the past. We look forward to reviewing the information CARB presented.

c. Flexibilities to accommodate diminishing ICE test groups

CARB Staff recognizes the difficulties with an ICE-only fleet average as the number of ICE test groups dwindle under the ZEV regulations. Some ideas to address this difficulty

include credit banking/trading and transferring excess ZEV values. CARB staff asked for additional ideas to address this issue.

- We agree flexibilities will be needed to manage an ICE-only fleet average as the number of ICE sales and models decline. As noted by staff, the conversion of a relatively lower-emitting ICE model (for its given footprint) to a ZEV can raise the remaining ICE fleet average emissions even though individual vehicle emissions do not change and overall fleet emissions decrease. Such issues only become more prevalent with time, as more ICEs are converted to ZEV.

- We continue to support credit banking and trading as a necessary flexibility for managing fleets.

- While we understand the provision to allow the transfer of excess ZEV credit values, it is unlikely to be useful given the extraordinarily high ZEV sales requirements in the 2030-2035MY timeframe – e.g., the 2030 ZEV requirement is 68% and the following year 76%. In the unlikely event an OEM has excess ZEV credits, it will likely need those to comply with the following year ZEV mandate. To be of value, regulatory flexibilities must be accessible and reasonable – this one is not.

d. Credits

i. Air Conditioning (AC) Refrigerant Leakage

We support maintaining a nominal leakage credit for ICE vehicles consistent with EPA regulations. Any reduction in credits at leak rates below 11 grams per year could reduce the incentive to maintain low-leak designs. We do not believe that a design-based leakage standard for ZEVs is necessary, particularly for low-GWP refrigerants. Customer satisfaction requires manufacturers develop exceptionally low leak AC systems and low-GWP refrigerant leakage make the need for a design-based leak standard unnecessary.

ii. Air Conditioning Efficiency Credits

We support aligning the AC efficiency credits for ICE and PHEV in 2030MY and beyond with EPA regulations.

iii. Off-Cycle Credits

We also support maintaining an off-cycle credit program for ICE vehicles.

e. Small Volume Manufacturers

Auto Innovators members include Ferrari and McLaren. Both have U.S. sales of less than 5,000 units per model year and are considered small-volume manufacturers (SVM). Their low U.S. and global volumes result in lower access to suppliers and delayed access to supplier-provided technologies. They have limited, narrowly focused product lines with infrequent redesigns and thus, do not substantially benefit from fleet emission averaging programs.

The products of these small volume manufacturers are high-performance supercars and track cars that are nonetheless certified for on-road use. The purchasers of such vehicles expect high performance, including racetrack capability, even if most will not be used for racing and are constrained in on-road use by U.S. traffic laws and highway designs and conditions. Such designs frequently require the use of different technologies than those used in mass-market vehicles to meet customers' expectations.

Emissions from vehicles sold by SVMs are negligible as their average annual mileage accumulation is extremely low – approximately 2,543 miles.[18] This has already been acknowledged by CARB in the ACC II Final Statement of Reason[19], indicating that small volume manufacturers represent less than 2% of total new vehicle sales in California and therefore have a limited impact on California's emission inventory.

CARB's current GHG emission regulation allows manufacturers with limited U.S. sales to comply with alternative targets (13 CCR 1961.3(a)(3)), in recognition of their unique design and compliance challenges. Auto Innovators recommends CARB retain this option through at least 2034 MY.

Moreover, as the industry's commitment to reduce GHG emissions equally - and proportionally - applies to small volume manufacturers, Auto Innovators calls for a thorough impact assessment section also covering these producers, in view of forthcoming ACC II amendments, and is willing to contribute accordingly.

---

[18] U.S. Department of Transportation, National Highway Traffic Safety Administration, Exemptions from Average Fuel Economy Standards; Passenger Automobile Average Fuel Economy Standards (Proposed rule; proposed decision to grant exemption), 87 Fed. Reg. 39439, 39449 (Jul. 1, 2022).

[19] Public Hearing to Consider Advanced Clean Cars II Regulations, Final Statement of Reasons for Rulemaking, Including Summary of Comments and Agency Response, Appendix C, Summary of Comments to ZEV Regulation and Agency Response (August 25, 2022)

4. Conclusion

We sincerely appreciate the opportunity to work with CARB on the update to ACC II regulations. Achieving our shared goals requires close cooperation between industry and the agencies. CARB and EPA regulations rely heavily on electrification, and industry is investing $100s of billions toward this end, and we can ill afford a softening of the ZEV market that might be indicated in Auto Innovators latest "Get Connected Report."[20] Aligning the EPA and CARB requirements while streamlining the requirements, test procedures, and certification will be essential to maintaining momentum and accelerating the transitioning to zero emission vehicles. We look forward to working with CARB staff over the next couple of years.

Dan Bowerson
Vice President, Energy & Environment
dbowerson@autosinnovate.org

Copy: Jennifer Gress
Belinda Chen
Anna Wong
Anna Scodel

[20] Alliance for Automotive Innovation [AAI]. (2024, Q1). Electric Vehicle Sales Overview (Q1 2024). https://www.autosinnovate.org/posts/papers-reports/Get%20Connected%20EV%20Quarterly%20Report%202024%20Q1.pdf