BMW GROUP

July 16, 2026

California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Drive Forward - Light-Duty Vehicle Program Second Public Workshop

BMW of North America, LLC appreciates the opportunity to provide comments on CARB's Drive Forward – Light-Duty Vehicle Program. We recognize the complexity of developing a regulatory framework that advances California's air quality and climate objectives while accounting for evolving technology, affordability, market conditions, supply chain constraints, and consumer needs.

Light-Duty NMOG+NOX Standards

BMW recognizes that light-duty vehicles contribute a non-negligible portion of the Smog-forming emissions in the state of California and understands the need to set stringent NMOG+NOX standards to address sources of those emissions. However, BMW has concerns regarding the assumptions underpinning the proposed NMOG+NOX standards as presented in the Drive Forward Workshop #2:

- The assumption of fleet average 20 mg/mi NMOG+NOX for ICE-equipped vehicles by 2038 may not be feasible.
- Certification to an emission bin below 20 mg/mi (i.e. Bin15) has not been demonstrated as possible with available emission control technology. Many of the technologies listed on Slide 15 of the presentation are already integrated into vehicles certified to 20 or 30 mg/mi emission bins.
- Taking examples from manufacturer certification level data (actual NMOG+NOX emission performance from certification documents) is not an appropriate way to determine feasibility of certification to a sub-20 mg/mi emission bin.
- Inclusion of ZEV in the NMOG+NOX fleet average detracts from its purpose which is to set feasible standards for tailpipe emissions.

In the Workshop presentation, CARB has pointed out that barely any vehicles are certified to 20 mg/mi NMOG+NOX as of 2024, with a significant portion of the overall vehicle fleet still certified to standards greater than SULEV30. Additionally, even in its ACC II rulemaking, CARB set forth an ICE-equipped NMOG+NOX fleet average targeting 30 mg/mi through 2035. Despite this, CARB is asserting the possibility of 20 mg/mi ICE-equipped fleet average standards by 2038 without any reasoning regarding feasibility with available emission control technology. Fleet average standards have historically allowed manufacturers to balance reduced emission standards with cost and consumer choice. The proposed NMOG+NOX fleet average standards effectively remove consumer choice by mandating technology type and limiting selections to ZEV and certain ICE technology. If implemented as proposed, these standards may not be feasible and will almost certainly drive-up the cost of vehicles. As an alternative, CARB should consider an NMOG+NOX fleet average standard applicable only to ICE-equipped vehicles, and which considers a feasible stringency increase from the LEV III final standard of 30 mg/mi. Such an approach would satisfy the need for Smog-

forming emission reductions in a feasible way which does not mandate a certain percentage of ZEV. In general, given challenging nature of the proposed standards, BMW is not supportive of a shorter phase-in of the fleet-average standard.

ZEV Certification Requirements

Battery Labelling
If CARB proposes a battery labelling requirement as part of the Drive Forward provisions for BEVs as well as PHEVs and HEVs, BMW recommends the following:

- The label is not required to be affixed to the vehicle in addition to the battery pack/module. It is unlikely that a recycler or service provider would need to reference such information from the vehicle body if it is already affixed to the battery pack.
- If the battery modules are not serviceable components which are separable from the battery pack, only the battery pack should be required to have the label.
- CARB should not deviate substantially from the battery label format which was introduced in ACC II. Manufacturers may have already implemented the label per the ACC II provisions and changing the format or appearance would create duplicative cost and effort.

Convenience Cord
If CARB proposes requirements for inclusion of a convenience cord, it should be clarified that the cord may be offered to the customer as an option from the manufacturer rather than included as standard equipment. If a cord is required as standard equipment, this will likely lead to an increased base vehicle price. Some customers may already be in possession of a cord or may wish to buy one from a third-party. Allowing the manufacturer to offer the cord as an option could reduce cost of the vehicle while still making the cord available.

High-level Communications Standards & J3400 Conformance
SAE J2953/3 has been developed through cross industry support, as well as through CharIN to align conformance testing and provide a list of conformance tests that are considered Priority 1 to ensure interoperability and safety. The Priority 1 conformance tests include 50 DIN test cases and 50 ISO test cases. BMW suggests that CARB requires conformance to SAE J2953/3 rather than blanket conformance to ISO and DIN test suites.

For SAE J3400, CARB requires that beginning with MY2031, “all plug-in vehicles must meet requirements in SAE J3400” or if an “alternative inlet is used” must provide an adapter for AC and DC inlets. There is a concern that the VAC specifications in SAE J3400 conflict with SAE J1772, something which was addressed during the ACCII commenting period. The maximum AC service limit voltage for SAE J1772 is 264V (240V is the nominal limit). On the other hand, SAE J3400 specifies the utilization voltage range as 120-277 VAC. Therefore, an adapter cannot enable a vehicle to meet all the specifications of the opposite standard from which the vehicle was designed for. Would an exception for this mismatch be made for SAE J3400 compliance?

BMW GROUP

Battery Durability and Warranty
BMW is supportive of an approach to account for "virtual miles" accumulated via V2X use. As vehicles are enabled with bidirectional charging capabilities and utilities roll out greater access for V2G, EV owners will experience increased battery cycling which will directly affect longevity of the battery. As such, it is important that additional cycling is accounted for to avoid confusion in warranty. Customers are familiar with vehicle miles as a criterion for determining warranty coverage, and therefore it makes sense to include a virtual mileage, rather than a "number of battery cycles" or "total energy discharge" parameter to account for V2X.

Non-Exhaust Emissions from Brake Wear
If CARB proposes brake wear PM mass emission standards in line with what was presented in the Drive Froward Workshop #2, every effort should be made to align with the internationally recognized standards codified as part of UN GTR 24. As such, BMW has the following concerns that CARB's proposal may diverge from those standards which have been developed cooperatively with the industry, including BMW, in the EU:

- CARB generally proposes to follow the UN GTR test procedures except for its inclusion of the California Brake Dynamometer Cycle (CBDC) in lieu of the WLTP-BC. This would effectively result in a more stringent standard than what is implemented under UN GTR 24 because the CBDC has a higher total specific friction work than the WLTP-BC.
- While CARB correctly has converted the standards under UN GTR 24 into "mg/mi", based on CARB's proposed vehicle categorization under said standards, the more stringent 5 mg/mi standard is applying equally to BEV and Hybrid vehicles. Under UN GTR, the Hybrid models are considered in the same category as ICE vehicles and are subject to the less stringent standard.

CARB should also clarify the definition of "Hybrid" in its vehicle categorization. Does hybrid mean exclusively PHEV and "Strong" hybrid vehicles, or also "Mild" hybrid including 48V systems?

Evaporative Emissions – NIRCOS System
In the Workshop, CARB proposed a need for tightened standards following results of "MECA testing" of a single vehicle equipped with a NIRCOS system. CARB should provide additional clarification on the following:

- Additional details regarding the MECA testing which resulted in the need for an additional standard (shared data, information regarding the tested vehicle).
- Is it CARB's intent to implement a specific off-board testing procedure into the in-use verification program?
- Will manufacturers be required to implement a more stringent OBD standard for NIRCOS-equipped vehicles?
- What outcomes are anticipated as a result of implementing this additional requirement?

BMW has concerns about implementation of an additional testing requirement in its in-use labs, and it is unclear whether the results of the MECA testing are indicative of a widespread issue or a vehicle-specific outlier.

BMW GROUP

Greenhouse Gas Emissions

In the Workshop, CARB presented declining GHG standards which represent a roughly 25% reduction in fleet average GHG emissions compared to the ACC I standard as of MY2031 with more than a 5% annual reduction in GHG emissions in each year thereafter, declining to a fleet average of roughly 80 g/mi by MY2038. These proposed standards represent a significant increase in stringency that will be challenging for manufacturers to meet given current market constraints pertaining to EV sales. CARB references a suite of technological approaches to improve ICE efficiency and reduce GHG emissions on slide 48 of its presentation, and while the technologies listed can provide efficiency GHG-reduction benefits, many of these technologies are already substantially implemented into the ICE fleet and remaining vehicles may not have a business case to support additional cost of implementing new technology. With that said, even historical improvement rates of 1%-2% will be difficult to attain with existing ICE technology alone, leaving a significant gap to the proposed standards. It is likely that the ICE fleet would only be capable of GHG reductions in the range of less than 1% annually for the applicable years.

Based on CARB statement during the workshop, it is assumed that the gap between ICE GHG reduction and the proposed stringency increase would be filled by EVs. Assuming minimal improvement in GHG from the existing ICE fleet, this would imply a target corridor of somewhere between 40-60% ZEV sales share, a level that is unlikely to be feasible given current pressures on the EV market in the US. Based on the above, BMW has the following feedback regarding the points CARB is seeking input on following their Workshop #2:

- BMW does not recommend a shorter phase-in of GHG fleet average given the challenging nature of the proposed standards as-is.
- BMW is open to discussing with CARB the ICE technologies which are already implemented in its fleet to provide additional context on the limitations of GHG improvement for ICE vehicles.
- BMW is supportive of potential early action credits for manufacturers that can meet the MY2031 GHG standards prior to 2031.
- With regards to alternative compliance pathways, BMW recommends retaining the averaging, banking and trading provisions that were included in ACC I GHG, such as pooling of credits between California and Section 177 states.

ZEV Minimum Floor

BMW has general concerns regarding a proposal for a ZEV minimum floor and the implications for Section 177 States. However, if CARB moves to propose a ZEV minimum floor BMW recommends that CARB consider the following when setting the boundary conditions.

Input on Starting Percentage and Phase-In

When determining the initial ZEV minimum floor and any subsequent percentage increases, CARB should evaluate the feasibility of those requirements not only in California, but also in Section 177 States. Additional Section 177 states may seek to adopt some or all elements of Drive Forward, and the feasibility of ZEV minimum levels

should therefore be assessed in light of market conditions across those jurisdictions. This is particularly important given recent developments affecting ZEV demand and affordability, including the removal of federal tax incentives and California's newly introduced ZEV incentive, which excludes a significant portion of BMW's ZEV portfolio.

Input on Flexibilities

CARB should consider conversion of vehicle values earned not only under 1962.4, but also under ACC I ZEV provisions. Many manufacturers may have unused ZEV credits earned in the ACC I years. CARB could consider one-time conversion of these credits into Drive Forward alongside conversion of 1962.4 credits, with potentially different conversion factors. This would allow manufacturers that were over-compliant with ACC I ZEV requirements to see some benefit from that early investment in EV technology. CARB should consider early compliance values for qualifying ZEVs in any year prior to Drive Forward (MY2031) to be used freely toward their Drive Forward ZEV minimum floor. Such a provision would provide incentive for manufacturers to comply early with the ZEV requirements considered as part of Drive Forward.

Input on Reporting Improvements

Manufacturers are currently subject to many requests for VIN-level wholesale and/or retail records to satisfy state-specific audit requirements under their ZEV programs. CARB should consider allowing manufacturers to attest to the accuracy of the sales data used in their end-of-MY ZEV reports such that they are not required to submit potentially hundreds or thousands of VIN records to multiple states. To allow states the ability to audit submitted sales data in the case of potentially erroneous data, a provision for VIN-level data requests could be made available if there was a significant deviation between submitted sales data and the state's DMV records.

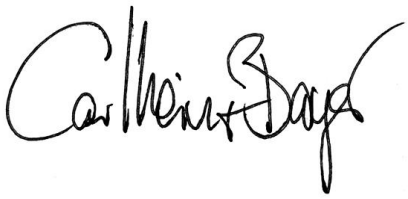
BEV Window Sticker

CARB should not finalize a proposed BEV window sticker that is inclusive of duplicative information when compared to the EPA Fuel Economy Label for BEV models. Supplemental range figures should not include the combined range, for example, and should avoid stating range figures like "highway" which is determined based on 70 MPH driving rather than the EPA Highway cycle. BMW is supportive of CARB's proposed approach to not require additional test cycles while still offering an option to submit alternative factors for calculation of Cold and Hot range, for example, CARB should not finalize any additional testing requirements to satisfy this window sticker. CARB should allow manufacturers the option to affix a physical label only, a QR code with a link to a label viewable on a manufacturer-hosted web page only, or both a physical and web-based label. This would allow manufacturers to determine which approach is best from a customer-facing, logistics and cost perspective.

BMW GROUP

BMW Group appreciates CARB staff's time and consideration of these comments on the Drive Forward proposal. We look forward to continuing to work constructively with CARB staff and welcome the opportunity to discuss these comments in greater detail as the regulatory process moves forward. Please feel free to contact us with any questions or if additional information would be helpful.

Sincerely,



Carlheinz Bayer
Head Emission Certification and Compliance

BMW Group in the U.S.
BMW Group began operations in the U.S. over 50 years ago. In addition to the sales, marketing, and distribution of BMW, MINI, Rolls-Royce, and BMW Motorrad vehicles, BMW Group's business in the U.S. spans 30 locations in 12 states including BMW Group Financial Services, BMW Manufacturing, Designworks, BMW Technology Office USA, and BMW i Ventures. The company's U.S. plant in South Carolina is the largest single BMW production facility in the world and the global center of competence for BMW Sports Activity Vehicles. The BMW Group sales organization is represented by a nationwide network of 355 BMW retailers, 147 BMW motorcycle retailers, 104 MINI passenger car dealers, and 38 Rolls-Royce Motor Car dealers. Taken together, BMW Group's business activities in the U.S. provide and support over 120,000 jobs and contribute more than $43.3 billion to the U.S. economy annually. For more information about BMW Group's business and products in the U.S., please visit: PressClub USA.

Company
BMW Group

Address
BMW of North America, LLC
200 BMW Drive,
Building 150
Woodcliff Lake,
NJ 07677-7731

Website
www.bmwgroup.com

Printed on Recycled Paper