Mercedes-Benz
Research & Development
North America, Inc.

17 July 2026

California Air Resources Board
1001 I Street
Sacramento, CA 95814

Subject: Comments on CARB's June 22 LD Drive Forward Workshop

Dear California Air Resources Board,

Mercedes-Benz Research & Development North America, Inc., and Mercedes-Benz USA, LLC, on behalf of Mercedes-Benz AG (hereinafter "Mercedes-Benz"), would like to thank the California Air Resources Board ("CARB") for the opportunity to provide comments on its second Light Duty ("LD") Drive Forward Workshop.

Mercedes-Benz is guided by our "Ambition 2039", which includes goals for net carbon neutrality[1] by 2039 and offers a complete set of desirable electrified product offerings to help meet our customers' needs. Mercedes-Benz has made significant investments in electric vehicle technology and remains committed to the success of our upcoming battery electric models. Our strategy is focused on providing customers the luxury of choice – offering electrified internal combustion, hybrid, and electric vehicles to meet a wide range of needs and preferences. Providing this full spectrum of powertrains supports a practical, consumer-driven path toward increased electrification, which better reflects current market conditions and customer expectations. Additionally, the Mercedes-Benz High-Power Charging network supports Mercedes-Benz's electric vehicles through the development of a public charging network powered by 100% clean energy that is open to all vehicle brands.

Mercedes-Benz attended CARB's 2nd Drive Forward workshop. Our comments as well as those filed by our trade association, Auto Innovators, address the overly stringent criteria and fleet standards which will force a high percentage of ZEV sales. They also address other certification requirements, which CARB is including to assure the quality of the ZEV vehicles.

## Fleet Average Compliance Should Not Depend on an Uncertain Future ZEV Market

CARB shared its plans for very stringent GHG and NMOG + NOx fleet averages. In both cases, ZEVs are to be included in the fleet average. Since there are very few technical solutions available, CARB is essentially forcing the sale of a high percentage of ZEV vehicles. The CA market was only at 15.7% at the end of Q1 of this year, and it is hard to imagine a sudden sharp sales increase that would reach the numbers needed to achieve the standards. And that is just for California, the challenges are

[1] Net carbon-neutral means that carbon emissions that are not avoided or reduced at Mercedes-Benz are compensated for by certified offsetting projects.



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significantly greater in many of the Section 177 States which have sales that are in the low single digits. CARB must consider the feasibility of compliance in those states in addition to the feasibility of compliance in California.

Furthermore, the future ZEV market is unpredictable. Since it is not possible for CARB to accurately predict market realities such as consumer demand, charging infrastructure deployment, affordability challenges, and broader market conditions, the fleet average standards should not be dependent on ZEV sales.

While Mercedes-Benz has several well-designed EV models planned for the US market, consumers must want to buy EVs. With the expiration of Inflation Reduction Act (IRA) electric vehicle incentives in the One Big Beautiful Bill Act, ZEV sales have dropped, a development that was not anticipated. Additionally, in a country as diverse as the USA, varied driving needs and living situations make it challenging to fuel an EV for many. While infrastructure is improving in volume and reliability, it is still not at all comparable to what has been in place for internal combustion vehicles, and is a major reason why many people refuse to even consider purchasing an EV. On top of these challenges, supply chain constraints, and a lack of battery critical minerals availability loom large. Lastly, while CARB has put forth the opportunity for a point of sales incentive through the Drive Forward Incentive Program, some manufacturers like Mercedes-Benz are unfortunately precluded from participating due to a $50K MSRP cap. That puts us at a competitive disadvantage, particularly when compliance with the fleet standards is going to rely heavily on ZEV sales. We would like to discuss ways CARB can level the playing field in the regulations.

The future criteria and GHG programs should preserve flexibility for manufacturers to deploy the most effective mix of technologies to achieve emissions reductions. Any program structure should recognize the continuing role of advanced ICE, hybrid, plug-in hybrid, and zero-emission vehicle technologies in delivering real-world GHG reductions.

## Criteria Emissions

### PM Emission Standards

CARB is planning to adopt 0.5 mg/mile PM standard EPA finalized in its Multipollutant Rule[2]. EPA's rulemaking states "EPA projects that to meet the -7 °C PM standard manufacturers will choose to adopt a combination of Gasoline Particulate Filters (GPF) and BEVs as the most practical and cost-effective means to control PM emissions".

Gas Particulate Filter (GPF) technology is well-established outside the United States. Mercedes-Benz supports the use of GPFs as one tool promoting emissions reductions. While GPFs lower PM levels for most vehicles, concerns related to measurement uncertainty remain. At such low PM levels, we observe a risk of unstable measurement results driven by test variability rather than the actual PM emissions

[2] U.S. Environmental Protection Agency, Final Rule: Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles, Vol. 89, No. 76 Fed. Reg. 27842 (April 18, 2024).

generated by the engine itself. Therefore, while GPFs are but one tool to reduce PM emissions, Mercedes-Benz asks CARB to consider the measurement variability associated with testing low levels of PM emissions in setting the standards, particularly meeting them for all test cycles and for MDVs. Once again, we would be happy to discuss our compliance challenges with CARB.

We support Auto Innovator's request for CARB to maintain the LEV IV PM standards of 1 mg/mi FTP and 3 mg/mi US06 and forgo any other requirements. We agree with Auto Innovators that the benefits of a 0.5 mg/mi standards over the LEV IV standards are negligible and not cost effective.

### Non-Exhaust Emissions from Brake Wear

New in Drive Forward, CARB is planning to include standards for non-exhaust emissions (NEE) from brake wear. If CARB determines there are significant gains from NEE regulations on new vehicles, then we would encourage CARB to adopt the European standards including the test cycle. These are already in use in Europe and under consideration in China and Korea. Any deviations from these standards, such as a requirement to use the CA test cycle, will add unnecessary burden and cost because it will require the installation of additional test cells.

Lastly, it will be important for CARB test methods to be test-bench-based rather than rely on full-vehicle tests. This is because vehicle testing methods are not fully developed to produce consistent results. Variability in test-bench-based methods can be controlled to tolerable levels. Additionally, on-road measurements would introduce other roadway emissions which cannot be easily filtered out of the brake emission measurements.

### NMOG + NOx Fleet Average

The NMOG + NOx fleet average is extremely stringent and would require up to 40% ZEV sales to meet compliance in CA and the Section 177 states. Instead, CARB should develop technology neutral regulations that take into account cost effectiveness and feasibility. Due to the stringency of the standard, CARB should allow for banking and trading and include flexibilities such as carry forward/carry back. Considering the challenges, it is unreasonable for CARB to consider a shorter phase-in of the fleet average standard.

Additionally, the aggressive phase-in proposed and increased costs associated with changes to NMOG + NOx fleet averages for medium-duty vehicles pose challenges for manufacturers, especially given the smaller market size and limited vehicle lines, within the medium-duty fleet, to distribute costs compared to light-duty vehicles. The population of the entire American Class 2b-3 fleet of work trucks, work vans, and cutaway chassis-cab vehicles is small; the entire segment consists of fewer than one million vehicles sold per year, compared to the light-duty fleet that consists of over 14 million vehicle sales.[3]

[3] 89 Fed. Reg. 52563

CARB's proposal to phase in the MDV fleet average from MY 2031 to MY 2033 does not provide adequate lead time for manufacturers due to the small number of medium-duty products each manufacturer makes. Manufacturers' medium-duty product lines generally refresh at a slower rate than their light-duty lines due to the limited number of medium-duty products.

### Evap Emissions Standards

At its workshop, CARB shared its preliminary proposal for evaporative emissions to address leakage from the NIRCOS fuel system. Mercedes-Benz has concerns about the practicality of measuring at such low levels in-use. Mercedes-Benz looks forward to finding an opportunity in the near future to discuss this further with you.

### PEMS

Mercedes-Benz emphasizes the importance of harmonized testing requirements across regulatory programs. Vehicle testing is an essential but costly part of the certification process, and aligned requirements across programs reduce manufacturers' testing burdens. CARB's proposed GCWR threshold for PEMS testing is misaligned with existing federal thresholds. This discrepancy could lead to manufacturers needing to conduct duplicative tests because of divergent requirements.

The proposed Drive Forward 14,000lb GCWR PEMS threshold would include vehicle configurations beyond CARB's stated target, including certain commercial vans, cutaways, and low towing capacity vehicles that were not identified as the focus of this requirement by CARB staff. Many of these near-threshold applications are characterized by urban and local delivery, passenger transportation, and vocational service routes rather than sustained trailer towing.

S&P Global Mobility data for 2025 indicates that vehicles in the medium-duty van segment are used for a wide variety of applications rather than for high-capacity towing applications. As summarized in Table 1, service, recreational, and vocational uses—such as small-business use, last-mile delivery, emergency vehicle, logistics, and eGrocery account for the majority of vehicle utilization, which are less towing-oriented applications than typically fulfilled by pickup trucks. The Drive Forward PEMS proposal, however, makes no differentiation between the diversity of use cases within the MDV segment.

*Table 1 – 2025 S&P Global Mobility US Van Segment Vocational Mix and Market Share by application, 2025*

| APPLICATION | SHARE OF 2025 MDV SALES |
|---|---|
| Services & Crafts | 26.90% |
| Rental | 25.00% |
| Trade and eGrocery | 11.70% |
| Emergency, Rescue and Municipal | 9.20% |
| Recreational Vehicles (RV) | 7.10% |
| CEP & Logistics | 5.80% |
| Construction | 4.90% |
| Manufacturing | 4.70% |
| Private | 3.10% |
| People Mover | 1.6% |

We encourage CARB to align the applicability thresholds with its stated intent to capture high-capacity towing vehicle applications, while avoiding unintended impacts on vehicle segments that were not identified by CARB as the focus of these requirements. PEMS testing is a finite and costly resource for both manufacturers and CARB. Extending applicability to lower-GCWR configurations increases compliance burdens and consumes limited testing capacity.

To address these concerns, Mercedes-Benz recommends that CARB consider the following alternatives:

- Preferred: Increase the applicability threshold to 22,000lb GCWR to reduce unintended impacts and testing burden on vehicle configurations that are not typically operated in sustained high-load towing conditions.
- Alternative: Increase the applicability threshold to 16,000lb GCWR as a minimum adjustment to avoid capturing certain commercial van and near-threshold pickup truck configurations while still capturing high towing capacity vehicle applications.
- If CARB retains the 14,000lb GCWR PEMS threshold: Provide additional lead time sufficient for implementation to reduce unintended impacts associated with additional testing burden to manufacturers.

If finalized, the Drive Forward PEMS requirements should be structured to capture the vehicle applications CARB intends to target without unintentionally expanding testing obligations to vehicle segments that are not the intended focus. The proposed 14,000lb GCWR threshold could sweep in van configurations focused on commercial and vocational use rather than actual high-capacity towing operation, creating additional burden to manufacturers. Raising the threshold to 22,000lb GCWR, or at least 16,000lb GCWR, would better align the requirement with CARB's stated objective while preserving

manufacturer and agency testing resources for the applications more likely to provide meaningful in-use emissions information.

### Testing

CARB should strive to align testing requirements with other major regulatory programs and internationally recognized test procedures. Avoiding unique California-specific requirements would improve compliance efficiency and allow manufacturers to focus resources on vehicle development and emissions reductions. We would ask CARB to adopt the same version of SAE J1634 as EPA. CARB should also align its partial soak, quick drive away, PHEV high-power cold start testing with LEV IV.

## GHG

CARB's GHG program should preserve flexibility for manufacturers to deploy the most effective mix of technologies to achieve emissions reductions. Any program structure should recognize the continuing role of advanced ICE, hybrid, plug-in hybrid, and zero-emission vehicle technologies in delivering real-world GHG reductions. As mentioned above, meeting a stringent fleet average standard of 80 g CO2/mi that includes ZEVs will force the sale of a high percentage ZEVs, and rely on an ongoing unpredictable market. For that reason, Mercedes-Benz not only encourages the agency to rethink the standard levels, but to include additional flexibilities beyond the AC credits for ICEs.

CARB should include the flexibilities that applied through MY25 including off-cycle menu credits. The availability of these credits continues to encourage the deployment of advanced technologies and does not add significant burden to either the industry or CARB for review or approval. Additionally, it will be important for CARB to maintain the credit and banking system. CARB should include opportunities to earn early credits, carry credits forward and backward, and to carry over existing credits into their Drive Forward credit bank. Lastly, due to the low ZEV sales in Section 177 States, it is critical that CARB include the ability to pool credits across CA and all of the Section 177 States.

Considering the challenges, it is unreasonable to pull the timeline ahead two years to 2036. There would not be enough lead time to deploy additional technologies across the fleet. Furthermore, it would require an even steeper increase in ZEV sales in both CA and the Section 177 States.

We agree with Auto Innovators' recommendation to defer any modifications to the PHEV utility factors until SAE had completed its revision of the J2841 standard. In the meantime, we encourage CARB to work with the industry to come up with a default interim factor while retaining an option to develop manufacturer specific factors.

Lastly, we agree with the agency's plans to omit upstream emissions. As CARB pointed out in the workshop, these are covered in other programs such as the Low Carbon Fuel Program, and such emissions are very challenging for automakers to quantify.

## ZEV0 Certification Bin

CARB has created a new ZEV0 bin for certification. At the workshop, CARB outlined the requirements for meeting the bin which include range, battery durability, battery warranty, convenience cord, data standardization and service information. It also appears that the requirements will include communication standards and battery labeling. Many of the criteria that must be met to comply with the ZEV0 bin certification were included in ACC II and so they are not new. However, CARB has added yet another hurdle for auto manufacturers by requiring that each element be met to certify a vehicle and then be counted in the criteria and GHG fleet averages. Since that is the case, CARB should ensure that the lift is not so high as to disqualify quality ZEV vehicles.

### Battery Durability and Warranty

CARB is proposing battery durability requirements similar to those adopted in ACC II. While recent studies and field data suggest that EV batteries are degrading more slowly than anticipated, these findings are based on legacy vehicle fleets and battery technologies. Battery systems will continue to evolve in response to customer demand for faster charging, lower cost, greater energy density, and improved sustainability. As manufacturers optimize battery systems across these multiple objectives, historical durability performance should not be assumed to predict the performance of future battery generations. Accordingly, we caution against relying solely on current fleet experience to justify increasingly stringent battery durability requirements.

The need for a flexible approach is further reinforced by California's growing emphasis on bidirectional charging and vehicle-to-grid applications. As we noted during the ACC II rulemaking, the long-term impact of these applications on battery durability remains uncertain. Battery usage associated with grid services increases energy throughput beyond what is required to operate the vehicle and may contribute to additional degradation. Manufacturers should not be held responsible for battery impacts resulting from grid services.

Accordingly, we urge CARB to adopt by reference UN GTR No. 22 and incorporate its virtual mile methodology for battery durability and warranty determinations. This approach provides a practical and technology-neutral mechanism to account for battery usage that falls outside normal vehicle propulsion and enables emerging technologies, including bidirectional charging, to be evaluated fairly and consistently.

Additionally, the proposed requirement to maintain 80% of certified range after 10 years or 150,000 miles presents a significant technical challenge and appears considerably more stringent than requirements in other major markets. We encourage CARB to carefully consider these factors when establishing battery durability requirements and to leverage internationally harmonized approaches that support technological innovation while maintaining durable battery performance for consumers.

### Convenience Cord

As in ACC II, CARB is requiring that auto manufacturers include a convenience cord meeting certain specifications with an electric vehicle at the point of sale, but now as a requirement for ZEV0

certification. We have no concerns with the specifications outlined by CARB for the cord itself. However, Mercedes-Benz is concerned about the cost associated with this requirement. We are committed to pricing our EVs as attractively as possible, both against competing EVs and against gasoline-powered vehicles. The convenience cord requirement will meaningfully increase the vehicle's MSRP, undermining these efforts.

We also anticipate declining customer demand for a convenience cord supplied with every vehicle. By 2031, many customers will already have a home charging solution, either through a previously purchased convenience cord or via an installed Level 2 charger. This is driven by ongoing utility incentives for EV charging equipment, as well as recent changes to California building codes that encourage the installation of Level 2 EV charging infrastructure. Therefore, we ask that CARB allow auto manufacturers the flexibility to offer a convenience cord as an option, balancing competitive EV pricing with individual customer demand for included charging equipment.

### Data Standardization and Propulsion Related Parts (PRPs)

At the workshop, CARB asked for input regarding challenges with implementing the PRP requirements and its definition. Mercedes-Benz would like CARB to refine the definition. There are numerous components whose failure does not “impede” the vehicle from remaining chargeable and drivable such as the performance booster and drive-by-wire. CARB could reduce implementation complexity by aligning more with the UN GTR22 in terms of data requirements, diagnostic logic, and thresholds, thereby avoiding duplicated development of PID/DID/ITIDs and inconsistent behavior across markets. CARB should also define and reference a fixed SAE J1979DA and J2012 version to stabilize data standardization and prevent unnecessary software rework, while retaining discretion on the version selection. Lastly, clear definitions of Driving Cycle would be helpful for implementation. We look forward to working with CARB to help refine the definition over the coming months.

### Communication Standards

We support the use of recognized communication standards to promote interoperability. However, the prescribed implementation sequence should not be mandated by regulation, as proposed. Customers have varying preferences regarding charging authentication, and while Plug and Charge is a convenient method, it should be offered as an option and not be forced on users.

## ZEV Sticker

CARB introduced the concept of the ZEV sticker during the ACC II amendment process. CARB distributed several surveys to understand what consumers would like to know about the vehicle they were considering purchasing. While we support providing key information to consumers, CARB should understand that adding another label or finding space on an existing label, and supporting this information adds cost to the vehicle. Since CARB has decided that the labels will be required, Mercedes-Benz has two requests from CARB. First, we would like CARB to allow automakers to use a QR code that links to our website as an option, rather than require that a sticker be placed on the vehicle.

The sticker may limit the amount of information that can be provided to the consumer. Second, we ask CARB to ensure that all metrics can be obtained without additional testing. We do appreciate that CARB is considering the ability to use conversion factors rather than requiring test data for cold and hot temperature range. However, it would require additional testing if these factors were not representative of our range and we needed to justify an alternative factor.

## ZEV Floor

CARB is interested in including a ZEV floor and a ZEV credit system in the regulation. We believe it is duplicative to drive ZEV sales both through stringent ZEV fleet standards and through a floor requirement which will require another recordkeeping and trading system

## Conclusion

Mercedes-Benz appreciates the opportunity to provide comments on the 2nd Drive Forward workshop. In closing we ask that CARB provide sufficient lead time to develop, validate, and deploy technologies needed to meet future standards. Early clarity regarding program structure, testing requirements, credit mechanisms, and compliance pathways is essential given vehicle development cycles. We also ask that CARB reduce burden by aligning with other regulatory programs and testing requirements. Most importantly, we ask that CARB base its standards on predictable technology deployment and not rely on the uncertain ZEV market.

Much of the technical details were not provided at the workshop, and so we look forward to continuing the conversation with CARB throughout the rulemaking process. Lastly, in addition to the comments made in this document, we support the comments filed by Auto Innovators.

Please let us know if you have any questions.

Sincerely,

MERCEDES-BENZ RESEARCH & DEVELOPMENT N.A., INC. – AND - MERCEDES-BENZ USA, LLC

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Date: 7/17/2026

- AND -

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