



MECA Clean Mobility

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November 21, 2025

**MECA COMMENTS
ON THE CALIFORNIA AIR RESOURCES BOARD'S
DRIVE FORWARD PROGRAM
October 21, 2025 WORKSHOP**

MECA Clean Mobility (MECA) appreciates the opportunity to provide comments on the California Air Resources Board's Workshop on the Drive Forward Light-Duty Vehicle Program held on October 21, 2025. MECA believes an important opportunity exists for CARB to align with the criteria standards included in EPA's multipollutant rule to better accelerate the clean mobility market, especially over the next decade. Given the current uncertainty with federal GHG standards for vehicles, California should evaluate cost-effective and feasible GHG standards that recognize reductions from vehicles and propulsion fuels, including reduced carbon intensity of liquid fuels and electricity driven by LCFS. CARB's Drive Forward could better position LEV and ZEV performance standards to continue to cost effectively reduce NOx, PM, VOCs and GHGs in all segments of the light-duty and medium duty fleets through the application of advanced internal combustion engines coupled with electrified powertrain system technologies. We also offer comments on potential amendments to CARB's ZEV assurance measures that are designed to advance ZEV technology and ensure improved durability and operability that will benefit the owners of electric vehicles.

MECA is a non-profit industry association of the world's leading manufacturers of technologies for clean mobility. Our members have supported this industry for over 50 years and have a proven track record in developing and manufacturing emission control, engine efficiency, battery materials, components and charging as well as electric propulsion technology for a wide variety of on-road and off-road vehicles and equipment in all world markets. Our industry has played an important role in the emissions success story associated with light-, medium- and heavy-duty vehicles in the United States, and has continually supported efforts to develop innovative, technology advancing, emission reduction programs to improve ambient air quality while reducing greenhouse gases that benefit the climate and yield fuel savings to consumers.

MECA appreciates the time and effort that CARB staff put into responding to Executive Order N-27-25 by receiving and incorporating feedback from a broad range of stakeholders on concepts for new regulations to reduce GHG, criteria, and toxic pollutants.

Our comments align with and supplement our earlier comments during the development of the LEV IV and ZEV programs. We look forward to discussing our comments further with staff to clarify our points and address your questions.

Summary

MECA supports the scope of CARB's new rulemaking and believes that California light- and medium-duty vehicle standards should be more completely aligned with EPA's Tier 4 program. This will facilitate manufacturers' product planning given California's projected decline in volumes of non-ZEV vehicles over the next 10-15 years. More specifically, our recommendations can be summarized as follows:

1. CARB should adopt EPA's PM standard for light- and medium-duty vehicles as finalized on March 20, 2024. This includes a 0.5 mg/mile standard for both FTP and US06 test cycles, as well as ambient (25°C) and cold (-7°C) conditions. Since EPA's requirements phase in from 2027-2031, we believe CARB could require full compliance in MY 2031 if that is the starting year for Drive Forward standards.
2. CARB should adopt EPA's NMOG+NOx standards for light- and medium-duty vehicles as finalized on March 20, 2024. CARB should allow the same number and values of light-duty and medium-duty NMOG+NOx certification bins.
3. CARB should conduct a forward-looking analysis of PHEV electric vehicle miles traveled (eVMT), fleet utility factors (FUFs) and GHG testing consideration based upon current best-in-class and future PHEVs that will meet minimum all-electric range requirements.
4. CARB should explore additional areas of real-world emission control, including a feasibility study on the potential for PEMS to be utilized as an in-use compliance tool for vehicles with ultralow levels of emissions.
5. MECA supports technologically feasible and performance-based GHG standards that can be cost-effectively achieved through application of a diversity of powertrains, including internal combustion engines, hybrids and fully electric vehicles.
6. MECA commends CARB for exploring the incentivization of additional technologies for GHG reduction, such as ethanol fueled vehicles, hydrogen combustion, and CO₂ scrubbers. MECA supports performance standards that treat all powertrain technologies on a level playing field, which enables innovation across internal combustion, hybrid and electric platforms.
7. MECA continues to recognize the benefit to emission reductions via the off-cycle credit program as a policy to expand the available technologies that vehicle manufacturers can deploy.
8. MECA supports ZEV assurance measures, including updated consumer-facing vehicle environmental performance labels for ZEVs reporting real-world charge rate and temperature-based all-electric range following respective SAE procedures.

Alignment with Federal 0.5 mg/mile PM Standard and Test Cycles

CARB should adopt EPA's PM standard for light- and medium-duty vehicles as finalized on March 20, 2024. This includes a 0.5 mg/mile standard for both FTP and US06 test cycles, as well as ambient (25°C) and cold (-7°C) conditions. Since EPA's requirements phase in from 2027-2031, we believe CARB could require full compliance in MY 2031 if that is the starting year for Drive Forward standards.

EPA's existing record demonstrates that the Light- and Medium-Duty PM standard of 0.5 mg/mile, including all updated certification test procedures in the rule, can be met by either electric vehicles or internal combustion engine vehicles with gasoline particulate filter technology (GPF) technology and advanced fuel injection already commonly used in most other automotive regions of the world.

EPA based the 0.5 mg/mile PM standard on a number of research studies as well as actual testing conducted during its rulemaking development. This testing not only proved the feasibility of a vehicle achieving the standard during all operating conditions, but it also demonstrated the feasibility to collect and measure PM at the necessary detection limits for certification. This measurement feasibility was conducted via a round-robin program that included three independent laboratories using existing CFR test methods that would require no additional test burden on manufacturers. Moreover, car and truck OEMs have been conducting exhaust PM research for decades and are well versed in the appropriate PM collection methodology that reduces sampling errors to enable ultralow limits of detection.

As of today, two years ahead of the start of EPA's MY 2027 PM limit implementation phase-in, two-thirds of the major automotive producing regions of the world, including Europe, China and India, are meeting even tighter PM emission standards than the U.S. 2027 requirements. To meet tightening particulate standards in other global regions, fuel injection and gasoline particulate filter (GPF) suppliers have continued to improve their commercially available technologies. In fact, nearly every European GDI engine car is currently certified with a GPF. China has gone as far as requiring all diesel and gasoline cars to be equipped with the best available control technology, based on wall flow GPF and DPF filters, that diesels have used in the US since 2007.

Based on evolution of control technologies, future Euro 7 standards will expand the operating window to include lower temperature operation, higher altitude and towing. In anticipation of these tighter limits over extended duty operation, suppliers have improved fuel injection¹ as well as diesel and gasoline particulate filters.² U.S. and international OEMs are exceeding requirements in other global markets equivalent to or more stringent than the 0.5 mg/mile standard beginning in the U.S. for 2027.³

¹ Yamaguchi, A., Dillner, J., Helmantel, A., Koopmans, L. et al., SAE 2023-01-0239;

² Obata, S., Furuta, Y., Ohashi, T., and Aoki, T., SAE 2023-01-0394.

³ <https://circabc.europa.eu/sd/a/fdd70a2d-b50a-4d0b-a92a-e64d41d0e947/CLOVE%20test%20limits%20AGVES%202020-10-27%20final%20vs2.pdf>

MECA's industry assessment, which is corroborated by others,⁴ concluded that a GPF will cost approximately \$50-\$300 per vehicle, depending on engine displacement. Our members are already working with their OEM customers to integrate this technology onto vehicles ahead of the 2027 implementation date of the Multipollutant Rule finalized in 2024. The 2025 model year already includes five vehicle models equipped with GPFs, with about 50 additional models expected by 2027 and another 18 in 2028. In fact, there are 17 MY2026 test groups representing over 50 vehicle models that are CARB-certified with GPFs since April 2025. Based on these projections, we believe CARB can justify alignment with EPA's 0.5 mg/mile PM standard and all of its accompanying provisions.

MECA conducted a study that showed this PM standard alone will result in annual decreases in PM pollution, reaching over 110,000 tons reduced in the year 2050 and delivering hundreds of millions of dollars in health benefits to Americans.⁵ Notably, those benefits can be achieved independent of the number of electric vehicles sold. Figure 2 illustrates this for the Energy Information Agency (EIA) Annual Energy Outlook 2022 (AEO2022) electrification forecast of 17% new EV sales in 2050.

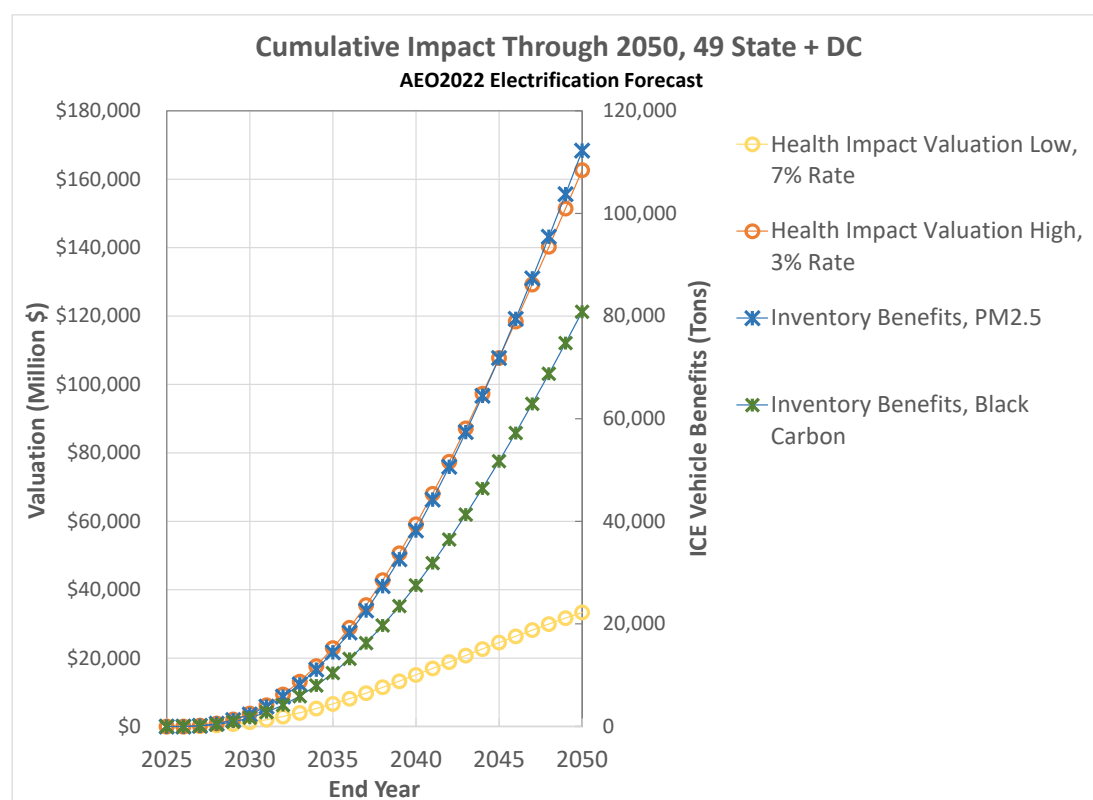


Figure 2. Cumulative Benefits of 0.5 mg/mile PM Standard Assuming Low EV Sales.

⁴ <https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockkey=P1019VPM.pdf>; <https://theicct.org/wp-content/uploads/2023/11/ID-48-%E2%80%93-U.S.-GPF-fact-sheet-letter-70112-v3.pdf>

⁵ https://www.meca.org/wp-content/uploads/2023/06/LDV_PM_Standard_Final_Report_06272023.pdf

Alignment with Federal NMOG+NOx Standards

CARB should adopt EPA’s NMOG+NOx standards for light- and medium-duty vehicles as finalized on March 20, 2024. CARB should allow the same number and values of light-duty and medium-duty NMOG+NOx certification bins. The light-duty and medium-duty NMOG+NOx fleet average standards of 15 mg/mile and 75 mg/mile, respectively, that phase in by 2032 can be met through multiple pathways, including both advanced ICE vehicles and ZEVs, and are therefore technology neutral. EPA ran several compliance scenarios in the Multipollutant Rule, including ambitious and mild projections of electric vehicle penetration. When EPA finalized the NMOG+NOx standards, it found that they were “feasible for ICE-based vehicles without taking into consideration the possibility of averaging with zero-emitting vehicles.”⁶ ICE cars and pick-up trucks can achieve these standards by employing targeted calibration of currently available engine and aftertreatment technologies, complemented by increasing adoption of hybrids already underway in the market.

Our analysis of currently available certification data⁷ supports that vehicle manufacturers have made substantial progress on the path to the Bin 30 fleet average level. In fact, we estimate that, under the revised bin structure adopted in the Multipollutant Rule, OEMs are poised to comply with the MY 2027 NMOG+NOx fleet average of 25 mg/mile with today’s U.S. sales mix that includes modest uptake of HEVs, PHEVs and BEVs. It has now been over twenty years since the first vehicle was certified to the Bin 30 standard and twelve years since the MY 2014 Honda Accord Hybrid became the first vehicle certified to Bin 20. As of June 2025, over 400 vehicle models met the Bin 30 standard while 30 are certified to the Bin 20 standard.

Advances in catalyst technology and honeycomb substrates have evolved to achieve NMOG+NOx emission levels well below 20 mg/mile. In fact, there are already 212 different vehicle models available for sale that emit under 15 mg/mile based on certification test data. That is more than triple the number just two years ago and speaks to the tremendous progress that suppliers and their OEM customers have made to continuously improve emissions from ICE vehicles. Today, even pick-up trucks, larger SUVs and mini-vans with conventional and hybrid powertrains are emitting at levels low enough to be certified down to Bin 15.⁸

A selection of Bin 20 and Bin 30 certified vehicles is shown in Figure 3. The horizontal arrows at the top of the figure represent the certification Bins. A sampling of compact cars, mid-size sedans, SUVs and pick-up trucks are listed along the x-axis. The blue vertical bars show the actual levels emitted by these vehicles over the FTP cycle, which are reported to EPA per certification requirements. It is evident that many vehicles sold today have significant margins below the required 30 mg/mile fleet average emissions limit. This sample set represents the vehicles employing advanced emission control technology and

⁶ <https://nepis.epa.gov/Exe/ZyPdf.cgi?Dockkey=P1019WE6.pdf>, page 1057.

⁷ <https://www.epa.gov/compliance-and-fuel-economy-data/annual-certification-data-vehicles-engines-and-equipment#Ct>

⁸ MY 2026 Volvo XC90 B5 AWD per EPA certification data referenced in footnote 50.

includes pure ICE, hybrid and plug-in hybrid powertrains all incorporating a combustion engine. EPA's Multipollutant Rule provided a generous phase-in of the fleet average from 2027 to 2032 to provide OEMs time to deploy technologies discussed below, across additional models and achieve the final fleet average standards by 2032.

The use of existing engine technology, hybrid powertrains and exhaust emission control architectures have also facilitated achieving the lowest Bin 20 and Bin 30 NMOG+NOx emission levels cost-effectively. Further technology improvements coupled with thorough engine mapping and improved calibration continue to be incorporated into new production vehicles to enable compliance with the declining NMOG+NOx fleet average independent of electric vehicle sales. MECA members are commercializing these engine, aftertreatment and electrified technologies that will enable a fleet average of 15 mg/mile NMOG+NOx by 2032.

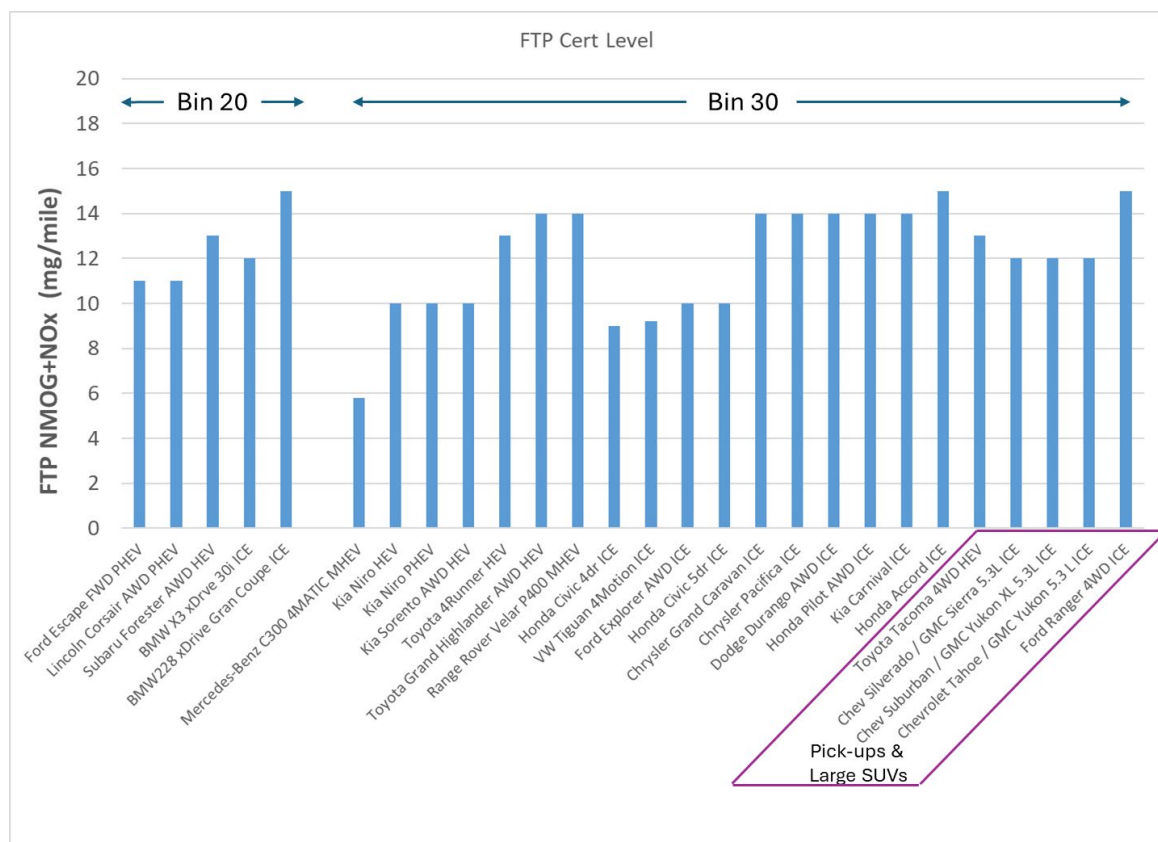


Figure 3. Model Year 2024-2025 NMOG+NOx Certification Data for Selected Vehicles.

In order to comply with lower NMOG+NOx and PM emissions standards over all certification cycles, manufacturers will employ improved engine maps and calibration strategies of existing engines and emission control related systems. Other design changes to system architecture can be deployed to manage engine-out emissions and exhaust flows, reduce catalyst light-off times, increase exhaust temperatures during periods of low-load or idle and reduce excessive warmed-up and hot running emissions to protect engine and emission control components which are susceptible to deterioration from extended exposure to severe exhaust temperatures.

Several choices can be made to improve and optimize emission control performance. For gasoline engines, the technology base of advanced three-way catalysts deposited on high cell density (as high as 1200 cells/in²), thin-walled substrates (approaching 0.05mm) have evolved dramatically for light- and medium-duty chassis certified vehicles to comply with LEV 3 standards. Recent advances have yielded high porosity, low thermal mass substrates with narrow pore size distributions, which enable high emission reduction efficiency with less precious metal loading.⁹ Catalyst coating technology based on layered or zoned architectures combined with targeted precious metal placement has been successful in controlling costs in light of rising raw material prices. Thus, we estimate the cost to bring a Bin 30 vehicle down to Bin 15 to be about \$50 - \$100 per vehicle. Furthermore, the introduction of the additional certification bins will provide greater certification flexibility to manufacturers. Our industry is on course to deliver the technologies that will allow our OEM customers to meet the final 15 mg/mile fleet average by 2032 without a requirement to sell more electric vehicles. In addition, federal standards allow OEMs to comply by selling EVs, and numerous analyses project a modest increase in U.S. EV sales driven by consumer interest over the coming decade. California is poised to outpace national EV sales, which increases the feasibility of compliance with a state 15 mg/mile NMOG+NOx standard.

We suggest that CARB consider best-in-class certification levels in setting NMOG+NOx standards for medium-duty vehicles. For example, MY2024 Class 2B best-in-class vehicles are achieving <30 mg/mile NMOG+NOx, and an overall fleet average of 59 mg/mile which indicates that a 75 mg/mile fleet average value for MY2031 and beyond is readily attainable. This feasible standard would be more protective of air quality, especially in communities disproportionately impacted by vehicle pollution and with inadequate infrastructure for ZEVs in the transition years.

In summary, our review of the industry data submitted to CARB and EPA over the last two years, since the Multipollutant Rule was proposed and finalized, has further strengthened the argument made in the 2023 analysis that led EPA to conclude that the 15 mg/mile NMOG+NOx fleet average can be met without a reliance on EV sales. The automotive industry, including MECA members, has continued to integrate better technology on vehicles, resulting in a tripling of the number of models emitting below the 15 mg/mile limit in the 2025 model year. Over the next seven years, the technologies can be deployed across a greater number of vehicles to bring the fleet average down to this level. This compelling evidence confirms that the final 2032 fleet average is a feasible and achievable performance-based limit that allows all technologies to participate and will stimulate innovation and create U.S. jobs across the automotive supplier sector while delivering real health benefits and supporting American jobs.

⁹ T. Asako, D. Saito, T. Hirao and E. Popp, SAE 2022-01-0543; J. Warkins, T. Tao, M. Shen and S. Lyu, SAE 2020-01-0652.

LD and MD NMOG+NO_x Certification Bins

We recommend alignment with all Tier 4 federal certification bin options, which will serve as a foundation to:

- Provide important manufacturer flexibilities
- Yield cost reductions
- Enable greater and longer product support
- Incentivizes OEMs to implement further CO₂ reduction technologies and calibration improvements

In addition, this would ensure alignment of Section 177 states as well as Canadian non-ZEV production resulting in the largest possible streamlined market for manufacturers and their suppliers, helping to reduce costs through economies of scale. The inclusion of the 5 and 10 mg/mile NMOG+NO_x certification bins may further incentivize manufacturers to incorporate additional near-zero emissions and new propulsion technologies on vehicle categories that are harder to electrify to meet customer demands.

We suggest that CARB should incorporate the federal Tier 4 certification bins below 75 mg/mile for medium-duty vehicles. There are existing vehicles that can already certify below the 75 mg/mile bin. Unifying the production requirements of medium-duty vehicles will provide the greatest incentive for manufacturers to supply the cleanest vehicles to support consumer needs as soon as possible.

Treatment of PHEV Technologies

We support CARB's increased minimum all-electric range (AER) and emissions testing requirements for PHEVs that were set under ACC II, and these requirements should be maintained in Drive Forward's light-duty regulation. We believe these requirements will result in advancements in future PHEVs that will lead to increases in all-electric operation combined with reduced emissions during charge sustaining operation.

Considering continuation of PHEV minimum AER and emission requirements, it would be premature to draw conclusions regarding future PHEV operation based on historic data. It is especially challenging to base U.S. PHEV operational characteristics on data from Europe because most of these vehicles are fleet-owned and drivers are often incentivized to fuel with gasoline rather than electricity. We agree that further investigation is needed to evaluate real-world PHEV GHG emissions as new longer-range vehicles are deployed. We believe that assessments of electric vehicle miles traveled (eVMT) and fleet utility factor (FUF) should be forward-looking, incorporating only current, best-in-class PHEVs and projections based on future PHEVs.

We are concerned with the current certification test method for determining emissions only during charge sustaining operation of PHEVs as it fails to evaluate the complete vehicle, as designed. If PHEVs are required to comply with higher all-electric range requirements to incentivize electric operation, PHEVs will have to employ larger and

heavier battery packs. The heavier battery will disadvantage the PHEV in charge sustaining (HEV) operation compared to a traditional HEV which has a 1-2kWh battery and covers only short distances (1-2 miles) under its normal hybrid electric-only operation mode. By only considering charge sustaining operation during emission testing, the procedure will negatively bias the PHEV's higher overall efficiency that is designed as a combined system with complementary EV and HEV propulsion.

Consideration of Additional Real-World Emission Control

MECA supports the heavy-duty in-use requirements that are set to go into effect with MY2027 heavy-duty engines and vehicles, and these will help to ensure low NOx emissions in the real world. Furthermore, these requirements can be utilized for medium-duty diesel vehicle in-use compliance assessment. Moving Average Window (MAW) requirements for heavy-duty are primarily used for NOx measurement, and there is significant data that corroborates the ability to measure NOx both in the laboratory and with PEMS down to very low detection limits suitable for tailpipe levels from light- and medium-duty gasoline vehicles.¹⁰ Similarly, there is considerable experience with the use of PEMS to measure PM at tailpipe levels commonly found in light-duty gasoline vehicles. With respect to hydrocarbons and in particular non-methane organic gases (NMOG), we suggest that CARB conduct a feasibility study to determine the applicability of PEMS for measurement of tailpipe levels found in light-duty vehicles.

Another area of focus for development of the most recent heavy-duty standards was the use of a speed-load trace from several actual drive cycles reproduced on a dynamometer to demonstrate feasibility of the standard. For heavy-duty, these driving cycles include the Southern NTE route, drayage cycle, grocery cycle and a European in-use compliance drive cycle. MECA supports CARB exploring more representative real-world cycles for light-duty vehicles, including how a European-style RDE cycle could be applied in the U.S. context.

GHG Standards Considerations

MECA supports technologically feasible GHG standards that can be cost-effectively achieved through application of a diversity of powertrains, including internal combustion engines, hybrids and fully electric vehicles. These standards, when designed appropriately, simultaneously promote technological progress and provide economic benefits to consumers of fuel-efficient vehicles, as well as improved health and welfare for all Americans.

Vehicle manufacturers rely on a variety of powertrain technologies and energy sources to meet tailpipe emission and fuel economy standards. This performance-based "systems approach" that pairs low-emitting engines and vehicles with clean fuels has been successful for decades. EPA has previously identified a large set of technology combinations available to reduce GHG emissions from passenger vehicles and light-duty

¹⁰ F. Posada, H. Badshah and F. Rodriguez, "In-use NOx emissions and compliance evaluation for modern heavy-duty vehicles in Europe and the United States," 2020.

trucks, including fuel-efficient advanced gasoline and diesel powertrains.¹¹ The majority of technologies that have been deployed in engines and vehicles have existed for decades and were initially designed into conventional internal combustion diesel and gasoline engines in response to GHG and CAFE requirements.

MECA members are committed to providing the full spectrum of technologies that allow all vehicles to meet feasible GHG requirements as well as the corresponding criteria pollutant standards. In addition to electrification, there are numerous cost-effective ways to reduce GHG emissions and improve fuel economy of ICE vehicles. As the conventional technologies are deployed, suppliers will continue to innovate new technologies on engines and transmissions as well as electrification to reduce vehicle GHG emissions to help their customers meet future standards. We urge CARB, consistent with past practice, to focus on setting performance-based policies that drive innovation in all areas of vehicle GHG reduction and fuel efficiency technologies.

Treatment of Vehicle Technologies

MECA commends CARB for exploring the incentivization of additional technologies for GHG reduction, such as ethanol fueled vehicles, hydrogen combustion, and CO₂ scrubbers. MECA supports regulations that treat all powertrain technologies on a level playing field, which enables innovation across internal combustion, hybrid and electric platforms. Today, nearly every OEM offers all these powertrains, which provides consumers with the choice that best meets their needs. However, these vehicles are still not treated equitably by GHG emission regulations due to CARB's tailpipe-only certification requirements. MECA suggests that CARB include upstream accounting of the emissions generated from the energy used for propulsion of all vehicles.

For a technology to be a sustainable and durable solution, it must demonstrate the ability to compete on a level playing field with other technologies to allow consumers the choice that meets their needs. MECA believes this is best accomplished through well-to-wheels life cycle accounting incorporated into performance-based standards. Currently, this is well established for ICE vehicles since the total emissions from fuel combustion are measured at the tailpipe. However, there are two gaps in the current certification methodology.

First, it does not include a means for accounting of emissions benefits of clean fuels during vehicle certification. For example, engines that operate on diesel are certified based on the assumption that all diesel fuel is petroleum-based. However, over 70% of California diesel fuel consumption was renewable diesel or biodiesel in 2024.¹² This trend is projected to increase as clean fuel production rises and displaces a larger fraction of petroleum fuels in the future.

The second gap in current certification requirements is allowing electric vehicles to certify to zero emissions despite electricity used to power them having a non-zero emission

¹¹ <https://nepis.epa.gov/Exe/ZyPDF.cgi/P100OXEO.PDF?Dockkey=P100OXEO.pdf>

¹² <https://cleanfuels.org/2024-saw-rapid-growth-for-biodiesel-renewable-diesel/>

footprint everywhere in the U.S. When CARB started its ZEV program in 1990, it decided to allow electric vehicles and fuel cell vehicles to claim 0 g/mile GHG in order to encourage the initial commercialization of these promising technologies. As sales of ZEVs increase, the inclusion of an upstream component during certification could help to spur advancement in energy efficiency of these vehicles, which will increase their GHG benefits.

EPA finalized requirements for upstream emissions to be factored into electric and fuel cell vehicle certification levels as penetration of these vehicles increased.¹³ The justification given by EPA was that “upstream GHG emission values associated with electric vehicles are generally higher than the upstream GHG emission values associated with gasoline vehicles, and that there is currently no national program in place to reduce GHG emissions from electric powerplants.”

Since we know the mix of sources for each region of the U.S. electricity grid,¹⁴ the emissions attributed to electricity used to power an electric vehicle could be reasonably estimated, projected into the future, and reported during certification. It should be noted that at this time we are not suggesting a full life cycle accounting method, such as the inclusion of emissions due to the manufacture of vehicles and production of fuels (both for generating electricity and direct consumption in the vehicle), due to the complexity of such an approach. CARB may utilize the procedures previously described in 40 CFR § 600.113-12.

Technologies that Reduce Off-Cycle Emissions

MECA continues to recognize the benefit to emission reductions via the off-cycle credit program as a policy to expand the available technologies that vehicle manufacturers can deploy. MECA represents both on-cycle and off-cycle technology suppliers, and therefore we are committed to credit policies that ensure measurable and verifiable CO₂ emission reductions in the real-world. Technologies that reduce emissions that are not fully captured by CARB certification test cycles include (but are not limited to) advanced alternators, stop-start systems and various thermal management systems like waste heat recovery.

ZEV Assurance Measures

We support CARB’s review of ZEV assurance measures, including consumer-facing vehicle labels and battery labeling requirements. We support an updated consumer-facing vehicle environmental performance label that includes vehicle efficiency, real-world charge rate and temperature based all-electric range. It is important that standardized procedures (such as SAE J1634 and J2953/4 respectively) be required for the data reported on these labels. For example, electric vehicle charging varies by type of vehicle and the condition of the vehicle and its battery. A vehicle’s battery management software may allow charging at a rapid rate for a short period of time while limiting charge rate at other times. If “real-

¹³ <https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-model-year-2012-2016-light-duty-vehicle>;

¹⁴ <https://www.epa.gov/egrid>

world charge rate” is to be reported, a well-defined methodology should incorporate an average rate of charging a battery from 10% SOC to 80% SOC at a specified charge power, such as 150 kW. Similarly, it is well-documented that electric vehicle range is affected by ambient temperature. Therefore, a consumer vehicle label should provide cold and hot ambient temperature range values.

Finally, electric vehicle efficiency is currently included on today’s vehicle labels. However, many consumers may not be able to interpret the value of an electric vehicle’s efficiency in kilowatt-hours per 100 miles without appropriate context. CARB could institute a labeling requirement for electric vehicles with similarities to Energy Star that includes displaying how an electric vehicle compares to other similar electric vehicles in its class. In addition, we urge CARB to review current certification cycles and test methods to ensure standardized certification testing yields accurate and unbiased efficiency values that are reported on vehicle labels.

We commend CARB for reviewing ZEV certification updates to ensure ZEVs are equally reliable and repairable to current ICE vehicles. This will aid in the continual advancement of consumer approval, which is a necessary step toward higher adoption of ZEV. While most current ZEV owners have found that the technology meets their needs, there remains a significant population of drivers who need further assurances that a ZEV will serve as a full replacement of their current ICE vehicle over the lifetime of ownership. Related to this point, CARB should work with relevant California state and local agencies to ensure charging infrastructure is developing at the pace needed for electrification targets, especially for multi-unit housing.

As experience with battery durability and warranty develops, MECA requests the requirements be revisited and extended to better represent the useful life of light-, medium- and heavy-duty vehicles. Most consumers expect the battery to last the life of the vehicle, and alignment of the durability period with the vehicle useful life will facilitate consumer acceptance and drive innovation in battery technology. Aligning EV durability and warranty requirements with those for ICE will also provide a level playing field for all vehicles whether EV or ICE and give consumers confidence in the reliability of any powertrain they choose.

Conclusion

In closing, MECA appreciates staff’s work in developing the concepts presented in the first workshop for the Drive Forward Light-Duty Vehicle Program. MECA believes that early alignment with EPA’s Tier 4 criteria standards would result in cost effective air quality benefits for millions of Californians. CARB should adopt EPA’s PM standard and NMOG+NOx standards for light- and medium-duty vehicles that begin with MY2027. MECA supports feasible GHG standards and regulations that treat all powertrain technologies on a level playing field, such as consideration of life cycle emissions in certification, which would enable innovation across internal combustion, hybrid, and electric platforms.

We commend CARB for taking a fresh look at technologies that can be employed on vehicles to meet the state's air quality and climate goals. Future PHEVs, low carbon fuels, and hydrogen combustion are complementary technologies to ZEVs that could provide additional emission reduction benefits. The addition of new real-world emission control strategies can assist in compliance assurance that will preserve projected benefits. The consideration of life cycle analysis will also ensure that projected benefits are seen in the real world. Finally, continued progress on ZEV assurance measures will help provide a level playing field for all vehicles whether EV or ICE and give consumers confidence in the reliability of any powertrain they choose.

Our industry continues to do its part by delivering cost-effective and durable advanced emission control as well as efficiency technologies for ICE vehicles and ZEVs to assist in simultaneously driving electrification and reducing criteria and GHG emissions from engine-equipped vehicles.

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