

**COMMENTS OF THE
MANUFACTURERS OF EMISSION CONTROLS ASSOCIATION
ON THE U.S. ENVIRONMENTAL PROTECTION AGENCY'S PROPOSED
DETERMINATION ON THE APPROPRIATENESS OF THE MODEL YEAR 2022-2025
LIGHT-DUTY VEHICLE GREENHOUSE GAS EMISSIONS STANDARDS UNDER
THE MIDTERM EVALUATION**

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The Manufacturers of Emission Controls Association (MECA) is pleased to provide comments in support of the U.S. EPA's Proposed Determination on the appropriateness of the model year 2022-2025 light-duty vehicle greenhouse gas (GHG) emissions standards under the Midterm Evaluation. We believe that EPA's conclusions are well thought out, thorough and comprehensive in providing a reasonable foundation that demonstrates the feasibility that vehicle manufacturers can readily comply with these standards. Technology providers and vehicle manufacturers have made significant advances since the 2017-2025 light-duty GHG standards were finalized in 2012. The pace of efficiency technology introduction and the breadth of technology options available for compliance has grown beyond early projections. We agree with the Agency's conclusion that the majority of the GHG reductions and efficiency improvements out to 2025 are still achievable through the broader deployment of efficiency technologies in conventional internal combustion powertrains and vehicles.

MECA is a non-profit association of the world's leading manufacturers of emission control, combustion efficiency and GHG reduction technology for mobile sources. Our members have over 40 years of experience and a proven track record in developing and manufacturing technologies for reducing criteria emissions and improving engine efficiency for a wide variety of on-road and off-road vehicles and equipment, including extensive experience in developing GHG reducing emission controls for gasoline and diesel light-duty vehicles in all world markets. Our industry has played an important role in the emissions success story associated with light-duty vehicles in the United States and has continually supported efforts to develop innovative, technology-forcing, emissions programs to mitigate air quality problems and minimize the impacts of climate change.

Controlling greenhouse gas emissions from the transportation sector is essential to the overall efforts to alleviate long-term impacts on the climate. As detailed in EPA's Proposed Determination and draft Technical Assessment Report (TAR), there is a large set of technology combinations available to reduce greenhouse gas emissions from passenger vehicles and light-duty trucks, including fuel efficient advanced gasoline and diesel powertrains. The vast majority of technologies being deployed across the light-duty fleet represent technologies that have existed for decades and are just now being applied to conventional internal combustion diesel and gasoline engines. As the conventional technologies are deployed, suppliers will continue to innovate new technologies to reduce vehicle CO₂ and GHG emissions to help their customers meet future standards. For the next several decades, there are likely to be numerous cost-effective ways to improve fuel economy without extensive use of strong hybridization or full

electrification. We urge the agencies to focus on setting performance based policies that facilitate innovation in all areas of vehicle fuel efficiency technologies.

MECA continues to recognize the benefit to real-world CO₂ reductions via the off-cycle credit program as a policy to expand the available technologies that vehicle manufacturers can deploy to meet the goals of the regulation. We appreciate EPA's response to our comments. Although we agree that the existing off-cycle methodology allows suppliers to partner with their customers to apply for off-cycle credits, suppliers have found it difficult to convince vehicle manufacturers to commit the full complement of resources needed to evaluate technologies on fully integrated vehicles without compelling data and indication that the agency believes a technology shows promise and is worthy of further consideration. Even a conservative estimate of the amount of credit a technology may offer would justify deployment of resources to fully demonstrate a technology. We continue to believe that a parallel supplier pathway to certification would greatly expand the available technologies and resources for full demonstration across a fleet of integrated vehicles. Expanding the off-cycle credit process to include EPA, NHTSA and the California Air Resources Board may be one consideration in the future to allow for resource sharing among the agencies for reviewing data and evaluating off-cycle technology pathways. MECA looks forward to working with EPA to explore the potential for certification flexibilities to be used to incentivize early market introduction of advanced off-cycle technologies.

Implicit in the federal greenhouse gas emission compliance scenarios is the ability of conventional and advanced powertrain options to meet the applicable criteria pollutant emission standards, such as CO, NO_x, and non-methane organic gases (NMOG). All of these advanced, light-duty powertrain options combined with the appropriately designed and optimized emission control technologies can meet all current and future federal and state criteria emission requirements. In this manner, advanced emission controls for criteria pollutants enable advanced powertrains to also be viable options for reducing greenhouse gas emissions. Future light-duty diesel powertrains will continue to use emission control technologies like diesel particulate filters, passive NO_x adsorber catalysts, and selective catalytic reduction catalysts to meet EPA's light-duty exhaust emission standards. Emission control manufacturers are working with their auto manufacturer partners to further optimize these emission control technologies to be more effective at reducing criteria pollutants and play a role in reducing vehicle greenhouse gas emissions. The ability to control NO_x over a broader temperature range offers calibration engineers with a wider operating window for calibrating the engine for greater fuel efficiency and thus lower GHG emissions. Advanced diesel emission control technologies will allow future diesel powertrains to be as clean as gasoline engines while retaining the improved fuel consumption characteristics of compression ignition. European vehicles are already implementing these technologies, and we expect experience to grow worldwide.

The Proposed Determination is based on the draft TAR, which discusses a range of powertrain technologies that manufacturers are deploying to improve the efficiency of their engines, including: engine turbochargers, exhaust gas recirculation systems, advanced fuel systems, variable valve actuation technology, advanced transmissions, hybrid powertrain components, and powertrain control modules. These technologies can be applied to both light-duty gasoline and diesel powertrains to help improve overall vehicle efficiencies and reduce fuel

consumption, both of which can result in lower CO₂ exhaust emissions. Auto manufacturers will take advantage of the synergies between advanced emission control technologies and advanced powertrains to optimize their performance with respect to both greenhouse gas and criteria pollutant exhaust emissions. MECA believes that light-duty diesel powertrains provide a cost-effective, durable approach for vehicle manufacturers to improve the average fuel economy of their fleets, particularly in the larger power category that includes small pick-up trucks and SUVs. MECA members offer a large portfolio of technologies for reducing both GHGs and criteria pollutants from advanced gasoline and diesel powertrains. By retaining the 2022-2025 GHG standards, the agencies offer the supplier industry the long-term outlook on which they rely to make lasting investments to ensure that technologies to simultaneously reduce criteria and GHG pollutants provide a cost-effective way for OEMs to meet their CO₂ and fuel economy targets.

For gasoline vehicles, direct injection technology has been deployed at a rapid pace, enabling gasoline engines to achieve greater fuel efficiency. Although significant advances have also occurred in improving the efficiency of naturally aspirated engines, GDI is expected to continue as the dominant pathway to meeting 2022-2025 light-duty greenhouse gas emission standards. Emissions controls ensure that these more fuel-efficient gasoline engines meet tough EPA and California criteria emission regulations. Advanced high performance, three-way catalysts are available and will continue to evolve to ensure that future gasoline direct injection engines will meet the toughest criteria pollutant emissions standards with minimal impacts on overall vehicle exhaust system backpressure and fuel consumption. MECA projects that the incremental cost of a catalyzed GPF above that of an underfloor converter is likely to be in the range of \$30-\$40 in the 2025 time-frame, making GPFs a cost-effective option for complying with the LEV III 1 mg/mile PM standard with no impact on fuel economy. EPA should consider aligning the Tier 3 PM limit with California ARB's 1 mg/mile limit as a way to harmonize a national particulate standard beyond 2025.

MECA would like to respond to EPA's requests for comment on: 1) the appropriateness of considering extending or modifying the temporary incentives for PHEVs, BEVs, and FCEVs to promote these technologies in the near-term in order to incentivize larger volume adoption in the long-term; and 2) the appropriateness of maintaining the current incentive provisions for MY2022-2025. MECA supports the early introductory use of incentives to promote innovative technologies that can be disadvantaged by lack of customer exposure and experience. However, in order for a technology to be a sustainable and durable solution, it must demonstrate the ability to compete on the same basis with other technologies to allow consumers the choice that meets their needs and meets performance based standards. EPA recognized this in the original rule by phasing out credits for MY2022-2025 PHEVs, BEVs and FCEVs. These powertrain technologies have been around for decades and have matured to the point where almost every manufacturer is offering multiple models equipped with these technologies, allowing consumers to make informed choices with respect to advanced powertrain vehicles. Furthermore, various federal and state tax credits have been and still are in place to provide consumers incentives for purchasing these vehicles. Another complication with the incentivization of EVs is the uncertainty in the environmental benefits. Numerous studies have shown that in many parts of the country, the temporary 0 gram/mile upstream emissions factor is not seen in the real world. The EPA transportation office's regulatory-based emissions standards and voluntary programs have always been both fuel- and technology-neutral since the first standards were set in the 1970s. MECA believes that EPA should continue to set performance-based standards

and assess whether an existing credit structure creates incentives for technologies that may not be delivering the intended emission reductions over the full well-to-wheels vehicle life cycle in the real world.

MECA appreciates EPA's response to our comments concerning evaporative emissions concerns from plug-in hybrid electric vehicles (PHEV). (These are incorporated here by reference.) We are concerned that EPA's response to our comments on the draft TAR with regard to evaporative emission impacts does not consider the 2012 final rule language regarding the "holistic" nature of the MTE (discussed at 77 FR 62652) and the assertion in 77 FR 62816 (incorrect in our view) that: "Focusing on vehicle tailpipe emissions has not raised any issues for criteria pollutants...." The fact that the draft TAR and Proposed Determination do not take our evaporative emission issues into consideration highlights the need to develop comprehensive emission standards beyond 2021 that harmonize all emissions from vehicles under one regulation and promote the optimization of GHG and criteria pollutant reductions in parallel. While the percentage of vehicles using PHEV technology to meet the 2022-2025 model year GHG standards remains to be seen, they are present in the fleet today and their penetration is expected to increase. PHEVs typically use pressurized fuel systems to reduce evaporative emissions from the fuel tank. This decreases vapor generation and in-use canister purge requirements. MECA still contends that an increase in PHEV sales related to the 2022 and later model year GHG and fuel economy rules may lead to an unintended increase in the VOC inventory. This potential increase can be remedied with appropriate test procedures and emission standards for vehicles with sealed tanks and NIRCOS evaporative control system designs.

MECA provided comments on the TAR indicating that Tier 3 evaporative emission and OBD requirements did not address potential increases in fuel vapor emissions related to pressurized fuel systems. As discussed in the comments, the first concern was related to fuel cap removal emissions (puff loss). These emissions could be relatively large in pressurized fuel systems, especially as the fuel in the tank falls below 20 percent of nominal volume and, as is common, the vehicle has experienced a series of sequential driving and diurnal events before refueling. The current Tier 3 requirements do not address this emission source through either a test procedure or emission standard. The only somewhat related provisions, which pre-date the development of PHEVs, are general requirements that fuel tanks must vent to the canister prior to cap removal if the fuel tank pressure exceeds 10 inches water (2.5 kPa) during the running loss test or during the development of the fuel tank temperature profile (40 CFR §§86.129-94(d)(6) and 86.134-96-(g)(1)(xvi) and (g)(2)(xii)). There is no specific regulatory prohibition requiring venting to the canister in-use for systems whose pressure exceeds a fixed kPa value. In a related section of the regulations, there is a provision that fuel tanks are not permitted to vent to atmosphere at any time (except for emergencies), but no implementing language regarding a definition of emergency is given (40 CFR §§86.096-8(b)(4) and 86.096-9(b)(4)). Today we see PHEV fuel tank pressures ranging between 18 and 30 kPa. More definition on requirements is needed in this area. Finally, as discussed in the EPA Tier 3 rulemaking documents, there is a concern that the OBD evaporative system leak detection threshold is too lax for pressurized fuel systems. Data provided in the MECA comments on the draft TAR and discussed in the EPA Tier 3 rulemaking documents indicate that fuel system vapor leak emissions would be much greater in pressurized fuel systems even at leak diameters much smaller than the present 0.020" detection threshold.

It is important that the GHG rule not result in a backsliding on VOC inventories as PHEVs are developed and optimized and, that if there are new requirements, they be developed in a timely manner so manufacturers can incorporate them into future PHEV fuel system designs and optimizations. Thus, we ask that the Agency commit to resolve these issues as part of this action or, working with California ARB, commit to a follow-on rule on an expedited schedule. To that end, MECA looks forward to working with EPA in future criteria pollutant regulatory efforts to address any unforeseen criteria emissions issues resulting from the 2022-2025 GHG standards, including those regarding PHEV evaporative emissions.

In summary, MECA supports EPA's Proposed Determination that, based on currently available technical information, GHG standards for model year 2022-2025 light-duty vehicles are appropriate for achieving the goals of the light-duty GHG program. Vehicle manufacturers can choose from a plethora of technologies to reduce emissions from the light-duty sector through the design of powertrains that include advanced exhaust emission controls along with advanced efficiency technology for meeting both the Tier 3 emission standards as well as the 2022-2025 GHG requirements. MECA believes that advanced efficiency and emission control systems have a critically important role in future policies that aim to reduce the entire emission footprint of light-duty vehicles. MECA members are developing the technologies that will allow advanced fuel-efficient powertrain designs to incorporate appropriate emission controls, in order to optimize the overall fuel consumption of the vehicle while achieving the tightest criteria pollutant standards in the world. This optimization extends beyond carbon dioxide emissions to include other significant greenhouse gases and climate forcing pollutants such as methane, nitrous oxide, and black carbon. MECA commends EPA for its thoroughness in reviewing and analyzing the technological progress that has been made in advanced light-duty powertrains and vehicle efficiency since the rule was finalized in 2012 and compiling this information and analysis into the draft TAR and the Technical Support Document that are part of the Proposed Determination. The report and determination are based on sound science and rigorous analysis to reach the logical conclusion that vehicles can achieve the standards as they were originally adopted in the final rulemaking. MECA looks forward to working with our customers, the vehicle manufacturers, in providing the necessary technologies to deliver the goals of the program.

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