

**COMMENTS OF THE  
MANUFACTURERS OF EMISSION CONTROLS ASSOCIATION  
ON CALIFORNIA AIR RESOURCES BOARD'S PROPOSED ADVANCED  
CLEAN TRUCKS REGULATION**

*May 28, 2020*

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The Manufacturers of Emission Controls Association (MECA) would like to provide both supportive comments as well as constructive suggested changes on the California Air Resources Board's (CARB) proposed rulemaking to accelerate adoption of zero-emission vehicles (ZEVs) in the medium- and heavy-duty truck sector and reduce the amount of harmful emissions generated from on-road mobile sources. We support CARB's ongoing leadership in the effort to reduce the environmental footprint of transportation to meet the state's SIP and climate goals, including technology advancing regulations that provide pathways, including electrification, to clean up the heavy-duty vehicle fleet. We believe an important opportunity exists to continue to reduce greenhouse gas and criteria emissions from medium- and heavy-duty engines and vehicles through the application of innovative technologies and fuels. MECA would like to reiterate some of our suggestions from the December Board hearing. Our recommendations have drawn on our long and successful partnership with CARB, and we believe they will strengthen this proposal by enhancing technology options that can be implemented to help meet the state's air quality and climate goals.

MECA is an industry trade association of the world's leading manufacturers of clean mobility technology. Our members have nearly 50 years of experience and a proven track record in developing and commercializing emission control, efficiency and electric technology for a wide variety of on-road and off-road vehicles and equipment in all world markets. Our members provide the technologies that enable heavy-duty on-road vehicles to meet the most stringent NOx and PM emission standards as well as electrification and all-electric technologies that reduce emissions of all pollutants, criteria and climate, and allow vehicles to be the cleanest possible. Our industry has played an important role in the environmental success story associated with light- and heavy-duty vehicles in the United States and has continually supported efforts to develop innovative, technology-advancing, regulatory programs to deal with air quality and climate challenges.

There is a long track record of meeting environmental goals through the implementation of performance-based standards and competing technology solutions. While technology mandates have been used to provide certainty in specific markets, they can result in premature barriers to investment and innovation in promising parallel pathways to achieving the same environmental goals. This has the unintended effect of destabilizing other markets for cost effective technologies, which can constrain the technology solution options to meet the state's air quality and climate goals.

We believe that the targets in this ACT proposal are extremely aggressive, with compliance pathways limited to battery electric and fuel cell vehicles and partial compliance credits for plug-in hybrid electric vehicles (PHEV). Although aggressive sales mandates signal to industry the direction the state is heading in the future, the history of the light-duty ZEV requirements resulted in multiple corrections in response to technology readiness and market demand. Repeated changes to original targets introduces uncertainty and creates risks to investments. With the ACT

regulation, CARB is expanding the ZEV policy model into commercial vehicles. Although some commercial vehicle segments may be more challenging to electrify than passenger cars, the proposed ACT sales targets are even more aggressive than those for light-duty vehicles. Technology suppliers believe that this rule would benefit from the inclusion of additional compliance pathways toward the same objective of net zero emissions. As providers of technology solutions for efficient engines, hybrids and ZEVs, we recognize that the pathway to electrification has market challenges that must be addressed, such as battery material availability, infrastructure and consumer acceptance. As governments and industry address these challenges and markets transition, we must continue to make progress in improving the efficiency in all commercial truck sectors. Given the uncertainties in assessing the lifecycle climate impacts of vehicles and fuels, MECA recommends that CARB remain open to additional technology options in its pursuit of a net zero-emission vehicle future. Therefore, we recommend the inclusion of additional compliance pathways into the current ACT proposal.

We believe that in those truck sectors that are more challenging to fully electrify in the near-term, electric hybrids can offer significant emission reductions as these sectors transition to full electric and the infrastructure is readied for a significant number of electric trucks. While PHEV have a compliance pathway in this regulation, non-plug-in hybrid electric vehicles (HEV) are not eligible for compliance. MECA recommends CARB consider allowing HEVs, that meet or exceed the MY2027 Phase 2 GHG standard early (or exceed the standard after MY2027), to be able to earn partial credits that are eligible for a portion of total ZEV compliance targets. We recommend that parallel compliance pathways be considered for the upcoming fleet compliance requirements that staff will be developing to provide options for qualifying truck powertrains.

An example where this type of approach has been proposed to expand parallel technology pathways in a zero-emission program is China's light-duty New Emission Vehicle (NEV) dual credit policy, recently proposed by China's Ministry of Industry and Information Technology. Following years of rapid growth in their market of battery electric cars, a large excess of credits were generated, allowing the increased production of larger conventional vehicles. The recent EV market pull-back has prompted China to amend the policy to add a provision allowing advanced hybrids, that exceed a minimum efficiency limit, to receive modest NEV credit towards compliance. If a vehicle meets or exceeds a threshold fuel economy limit, an OEM may obtain partial credit for its sale. The partial credit limit was set stringent enough to continue to drive investment and innovation to improve the efficiency of all vehicles.

The types of vehicles that could meet these ultra-low fuel consumption levels include advanced HEVs that couple the cleanest engine technologies with electrified powertrains. In passenger cars, we have seen HEVs continue to improve with sustained innovation of advanced combustion, efficiency and electric technologies. This battery and component innovation has expanded into electric trucks, and incentives will enable faster penetration into the commercial truck fleet. Such a parallel technology approach would not subtract from the ACT but only expand the options toward meeting the state's environmental goals. Ultimately, the environmental goals are the policy drivers leaving industry in the business of delivering the technology that meets those targets in the most cost-effective way for consumers.

A review of hybrid passenger vehicles currently available for sale shows that fuel economy in city driving is 50-100% higher for the hybrid model compared to its gasoline counterpart. This type of savings, if incentivized through technology for vocational trucks that spend most of their

time on city streets, would result in much greater benefits than current Phase 2 GHG limits. Most predict that the Phase 2 GHG regulation requirements are not likely to result in significant market penetration of full hybrid vehicle models, especially given the removal of the advanced technology multiplier credits that hybrids received in Phase 1. For those truck segments that are less amenable to full electric powertrains, broad application of hybridization delivers sustainable electrification and magnitudes greater emission reductions than a limited number of all-electric trucks. A recent article quantified the environmental sustainable pathways of HEV and BEV powertrains for passenger cars (<https://seekingalpha.com/article/4271072-long-range-evs-antithesis-efficiency-sustainability>).

In the transition to CARB's goal of a net zero-emission fleet, conventional engines will continue to be built for years to come and, if operated on low carbon fuel, these will also offer parallel criteria and GHG reductions. MECA has applauded CARB's innovative Low Carbon Fuel Standard (LCFS) that incorporates consideration of life cycle analysis as a parallel path to decarbonize the in-use fleet. We believe that inclusion of a parallel compliance path for the non-electric fleet would encourage continued investment in low carbon fuels that are not considered a compliance option for this regulation. MECA suggests that CARB consider complementary fleet rules and vehicle sales rules that allow for partial compliance with ZEV mandates via combined vehicle and low carbon fuel approaches, such as ultra-low NOx trucks fueled by low to net zero-carbon fuels under the ACT or a complementary in-use fleet regulation.

California has a long history of utilizing a combination of regulation and incentivization to achieve air quality and climate goals. For example, new heavy-duty truck emissions have been significantly reduced by setting engine emission standards while in-use truck emissions have been cleaned up by retrofit, repower and replacement projects through the Carl Moyer program. It is important that these two approaches are maintained together in the future, especially as CARB plans to implement requirements on fleets to purchase electric heavy-duty vehicles. In the past, the in-use fleet rule implementation timeline had to be revised due to economic hardship experienced by fleets during a previous economic recession. Incentive funding will continue to play an important role, especially if fleets are affected by a future economic downturn, including one resulting from the COVID-19 pandemic.

MECA members continue to support CARB's ongoing efforts to set near-zero NOx standards for heavy-duty trucks, and the heavy-duty truck omnibus regulation is on the same timeline as ACT as both proposals are scheduled to be brought before the Board in summer 2020 and implemented along parallel timelines, beginning in 2024. The Low-NOx Omnibus and ACT regulations will affect the same vehicles and stakeholders, so we recommend that the emissions inventories and market analyses for these be considered holistically. In reviewing the regulatory impact analysis for the ACT Regulation, we found that it excludes well-to-tank criteria emissions. The reason for this assumption is not explicitly stated in the analysis, and the staff report would benefit from including the rationale behind making this assumption. This is especially important as the ACT Regulation and forthcoming Low-NOx Omnibus are scheduled to be implemented along the same timeline and would therefore be regulating trucks in the same market.

For example, the Low-NOx Omnibus allows NOx emissions from electric trucks to be counted as zero for the purposes of Averaging, Banking and Trading. The Omnibus (as currently proposed) would allow OEMs to certify engines up to a cap of 0.05 g/bhp-hr, as long as the engine family meets the emission limit of 0.02 g/bhp-hr. The NOx emissions from natural gas and diesel

engines would be averaged against electric trucks that count as zero emissions. However, despite current commitments to renewable power generation, projections of California's power grid show that the majority of power between now and 2030 will continue to be generated from fossil fuel (natural gas) sources, which will therefore produce NOx emissions. Our concern is that overly discounting upstream NOx emissions from power generation could result in an unintended increase in the state NOx inventory than has been projected by the two regulations since they are not being considered in concert.

As the battery electric and fuel cell electric truck markets mature, in order to continue to drive technology innovation toward lower emitting trucks, we support revisiting the Zero Emission Powertrain (ZEP) requirements to establish performance standards for the batteries and components on electric trucks. This would drive continual improvement in electric truck component development and ensure the most cost-effective overall emission reductions and the most affordable trucks for California. Examples of performance standards for electric vehicles could include battery performance and durability standards, such as lifecycle emission reduction goals, range requirements, and short- and long-term deterioration limits. CARB has the opportunity to provide confidence to consumers who have limited experience with electrified technologies. Furthermore, performance standards also provide consumer protections to those who invest in these technologies. We have witnessed over a history of transportation regulations and incentive programs, that performance standards lead to continued progress in the development of cost-effective robust technologies to ensure the cleanest and most efficient vehicles and equipment.

In conclusion, MECA commends California's leadership to reduce emissions of criteria and climate pollutants. The heavy-duty transportation sector is responsible for a major portion of California's emissions inventory, and these emissions are forecast to continue increasing, reflecting the anticipated impact of factors such as economic growth, increased movement of freight by trucks, ships, and rail, and continued growth in personal travel. There are significant opportunities to continue to reduce criteria and greenhouse gas emissions from medium- and heavy-duty engines and vehicles through the application of innovative technologies and fuels, including all-electric trucks. We believe the inclusion of additional compliance pathways will strengthen this proposal and advance complementary technologies that can be implemented to meet the state's air quality and climate goals.

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