

**COMMENTS OF THE
MANUFACTURERS OF EMISSION CONTROLS ASSOCIATION
ON CALIFORNIA AIR RESOURCES BOARD'S SECOND NOTICE OF
MODIFIED TEXT AND AVAILABILITY OF ADDITIONAL
DOCUMENTS FOR THE PROPOSED AMENDMENTS TO THE HEAVY-
DUTY ENGINE AND VEHICLE OMNIBUS REGULATION AND
ASSOCIATED AMENDMENTS**

July 6, 2021

The Manufacturers of Emission Controls Association (MECA) is pleased to provide comments on the California Air Resources Board's (CARB) proposed second notice of 15-day changes to the Heavy-Duty Low-NOx Omnibus Regulation. By setting more stringent standards and other requirements for the medium- and heavy-duty truck sector, this rulemaking will 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 to clean up the heavy-duty vehicle fleet. We appreciate CARB staff reviewing the comments from a diverse group of stakeholders and working to balance these concerns in the proposed amendments. Our comments herein are to provide input to CARB staff as they consider the changes being proposed related to certification flexibilities for certain heavy-duty diesel engines. Particularly, we would like to focus on the state of technology readiness and the mechanism for offsetting emissions from legacy engines through the use of credits.

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 (battery and fuel cell) that reduce emissions of all pollutants, criteria and climate, and allow commercial 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 CARB's efforts to develop innovative, technology-advancing, regulatory programs to deal with air quality and climate challenges.

Technology Readiness

Over the course of the Omnibus rulemaking, MECA has published several white papers, including two that focus on technologies to meet low-NOx emission standards. In addition, MECA has supported CARB's demonstration program that was recently concluded with positive results showing multiple pathways for trucks to meet the Omnibus targets. Advanced catalyst models and engine demonstration testing have shown that the interim Omnibus standards can be achieved through a combination of improved engine calibration, upgraded dosing calibration and mixing, and the latest commercially available catalysts. MECA understands CARB's proposal to

offer flexibility that allows a portion of legacy engines to be certified for sale in California for model years 2024 and 2025. We appreciate the challenges of certain vocational sectors in obtaining vehicles with engines certified to the interim standards that are only required for 3 years before the final standards are implemented. While we cannot comment on the likelihood of OEMs offering engines for sale that meet the Omnibus requirements in these interim model years, we would like to reiterate our position that technology is readily available today without changing the exhaust architecture and can be integrated on trucks in the 2024 timeframe to achieve the Omnibus emission limit of 0.05 g/bhp-hr over the FTP. Furthermore, several low-NOx CNG engines meeting the 2027 FTP limit of 0.02 g/bhp-hr are currently available for sale today in California.

As noted in CARB's April 2019 white paper, emission results submitted by OEMs on fully aged systems indicate that FTP limits between 0.05 and 0.10 g/bhp-hr are being measured on some engines and aftertreatment at today's durability requirement. The systems on trucks offered for sale today represent catalysts that are from previous generation technology. Technology development continues and the catalysts provided for the first aftertreatment system on the 2014 Volvo engine at SwRI were quite different than those offered just a few years later for the 2017 Cummins X15 engine. In fact, the engines themselves are quite different and represent a variety of engine designs on trucks in the market.

During the initial calibration and aftertreatment screening work at SwRI, the stock 2014 commercial aftertreatment system could achieve less than 0.08 g/bhp-hr with only calibration improvements. In the early technology screening phase of the program, SwRI showed that some of the traditional aftertreatment designs with better catalysts and substrates, provided by MECA members (7 years ago), and engine based thermal management reduced the emissions down to the 0.05 g/bhp-hr level. As we discuss in our 2024 technology white paper (http://www.meca.org/resources/MECA_MY_2024_HD_Low_NOx_Report_061019.pdf), the combination of engine calibration, thermal management and exhaust aftertreatment technologies being offered to OEM customers today achieve FTP levels below 0.05 g/bhp-hr. Today, manufacturers are offering catalyst formulations to their customers for aftertreatment that delivers emissions below 0.05 g/bhp-hr on the FTP.

Offsetting Legacy Engine Emissions

In the transition years of 2024-2026, in addition to a 75% tighter NOx standard, the Omnibus included a new Low Load Cycle (LLC) at certification as well as replaced the NTE program with a moving-average-windows (MAW) compliance requirement similar to the in-service conformity (ISC) methodology used in Europe. ICCT has shown that in Europe, where a MAW analysis has been required during ISC testing since 2013, the same type of aftertreatment systems used on Euro VI compliant trucks achieve much lower emissions than U.S. 2010 technology trucks at the low speeds often experienced in the real world (<https://theicct.org/publications/inuse-nox-hdvs-us-eu>). In fact, CARB recognized the importance of addressing low load operation and changing the compliance program to manage the types of vehicle operation where the real-world emissions far exceed on-cycle emissions and in many cases exceed the modeled emissions used in CARB's EMFAC inventory model.

CARB's in-use testing has confirmed the limitations of the current compliance program based on the Not to Exceed (NTE) requirements for trucks that currently certify to the FTP

standard of 0.2 g/bhp-hr. Over real duty-cycles and the many exclusions allowed by the NTE program the trucks must meet a 0.3 g/bhp-hr on the road. CARB has shown and the ICCT has confirmed (in the report above) that only about 5% of the tests meet the conditions of a valid NTE. This has resulted in some legacy trucks emitting up to 20 times more NOx in real-world driving conditions. The location of these emissions disproportionately impacts communities near roadways and freight hubs such as ports, railyards and warehouses.

MECA supports flexibilities for industry as new regulations are phased in. This allows for suppliers to work with their OEM customers to develop durable cost-effective products. In fact, the Omnibus as originally proposed includes a phase-in schedule for several requirements. The emission standards themselves step down in 2024 and then again in 2027 to enable a smooth transition for industry. Similarly, the warranty and durability requirements as well as elements of the heavy-duty in-use testing/compliance program also phase in from 2024 to 2031. MECA appreciates and supports CARB staff's effort to incorporate provisions into the 15-day modifications to make-up for any loss in NOx reductions from selling 0.2 g engines in 2024-2025. In the second set of 15-day changes, CARB's proposed flexibility allows engines to exceed the Omnibus FEL cap of 0.1 g/bhp-hr while providing for the use of zero-emission truck credits by OEMs who choose to certify a portion of their engines at pre-2024 standards in model years 2024 and 2025.

Given that technologies are readily available for engines to meet MY 2024 standards, the decision by an OEM to take advantage of these proposed flexibilities is a business decision not to invest the capital to certify certain low volume engines for a limited period of two years. The 0.2 g engines sold will remain in the fleet for over 20 years. Furthermore, since legacy engines do not certify to the LLC, the calculation of credits will only be required to offset the difference between the certification standards of 0.2 g/bhp-hr and 0.05 g/bhp-hr. CARB could take into account these compounding factors when finalizing the calculation of credits needed to offset legacy engine NOx emissions in model years 2024 and 2025.

Conclusion

MECA strongly supports CARB's proposed Omnibus Regulation. This regulation will result in cost effective air quality benefits for millions of Californians living in nonattainment areas and/or along highways, ports and other freight corridors. MECA believes that the emission limits and implementation timeline of the Omnibus are technologically achievable and cost effective. We urge CARB to work with U.S. EPA to adopt a national set of harmonized standards. We also wish to thank CARB staff for its willingness to work closely with all interested parties and for considering our comments on the proposal.

We appreciate CARB's efforts to provide flexibility to the regulated industry and in making vehicles available to end-users as new standards are phased in. We believe an averaging, banking and trading mechanism should reflect the differences between the legacy engine standards and Omnibus engine standards and include some consideration of the real-world emission reductions brought forth by the comprehensive Omnibus rule. Our industry is prepared to do its part and deliver cost-effective and durable advanced emission control and efficiency technologies to the heavy-duty sector to assist in simultaneously achieving lower GHG and NOx emissions, while also meeting other criteria pollutant standards.

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