

**Written Comments of the Manufacturers of Emission Controls Association
on the Maine Department of Environmental Protection's Proposed Amendments to its
LEV Rule (Chapter 127 New Motor Vehicle Emission Standards) to Incorporate
California's Motor Vehicle Emission Standards**

November 2, 2012

The Manufacturers of Emission Controls Association (MECA) is pleased to provide comments in support of the Maine Department of Environmental Protection's proposed amendments to its low-emission vehicle (LEV) rule, which would adopt the California ARB's new LEV III, greenhouse gas (GHG), and zero-emission vehicle (ZEV) standards for new motor vehicles and motor vehicle engines, as well as their aftermarket converter requirements for existing light-duty vehicles. These amendments, if adopted, will reset the bar for state-of-the-art exhaust and evaporative emission controls for light-duty vehicles through 2025. MECA applauds the Maine DEP for bringing forward a comprehensive set of proposals covering light-duty criteria pollutant emission standards and vehicle greenhouse gas emission standards for future vehicles.

MECA is a non-profit association of the world's leading manufacturers of emission control technology for mobile sources. Our members have over 40 years of experience and a proven track record in developing and manufacturing emission control technology for a wide variety of on-road and off-road vehicles and equipment, including extensive experience in developing exhaust and evaporative emission controls for gasoline and diesel light-duty vehicles in all world markets. A number of our members have extensive experience in the development, manufacture, and application of three-way catalyst technologies to help enable motor vehicles to meet existing LEV II and Tier 2 emission standards for new vehicles. Our industry has played an important role in the emission control success story associated with light-duty vehicles around the world, and has continually supported efforts to develop innovative, technology-forcing, emission control programs to deal with unique air quality problems.

MECA provided detailed written comments to ARB in January of this year (see: www.meca.org/galleries/default-file/MECA%20comments%20on%20ARB%20LEV%20III,%20post-2016%20GHG%20012512.pdf) as part of their proposed rulemaking for the Advanced Clean Cars program, which was officially approved by the ARB Board on January 27, 2012. In those comments, MECA agreed with ARB staff's assessment that achieving the proposed LEV III exhaust and evaporative emission standards and associated emission reductions are both technically feasible and cost-effective. This fact is clearly demonstrated by the more than two million SULEV- and PZEV-compliant light-duty vehicles that have been sold in the California market since these near-zero emission, gasoline vehicles were first introduced more than ten years ago. The technology base of advanced three-way catalysts, exhaust hydrocarbon adsorber materials, high cell density substrates, emission system thermal management strategies, secondary air injection systems, advanced carbon canisters, advanced low fuel permeation materials, and air intake hydrocarbon adsorber materials that have already been commercialized for PZEV gasoline vehicle applications can be extended to and further optimized to allow all

light-, medium-, and heavy-duty gasoline vehicles to achieve the exhaust and evaporative emission reductions needed by vehicle manufacturers to comply with the LEV III emission limits. In addition, advanced diesel emission control technologies, including diesel particulate filters, lean NOx adsorber catalysts, and selective catalytic reduction catalysts, will be combined with future, advanced diesel engines to allow light-duty diesel vehicles to achieve the LEV III emission limits.

MECA also fully supported ARB's post-2016 greenhouse gas emission standards for light-duty vehicles. Implicit in federal and state greenhouse gas emission analyses is the ability of these advanced powertrain options to meet the applicable criteria pollutant emission standards, such as for carbon monoxide (CO), oxides of nitrogen (NOx), 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. A range of powertrain technologies, including engine turbochargers, exhaust gas recirculation systems, advanced fuel systems, variable valve actuation technology, advanced transmissions, hybrid powertrain components, and powertrain control modules, that can be applied to both light-duty gasoline and diesel powertrains to help improve overall vehicle efficiencies, also help reduce fuel consumption, both of which can result in lower CO₂ exhaust emissions. In many cases, the application and optimization of advanced emission control technologies on advanced powertrains can be achieved with minimal impacts on overall fuel consumption. Auto manufacturers will also take advantage of synergies between advanced emission control technologies and advanced powertrains to assist in their efforts to optimize their performance with respect to both criteria pollutant and greenhouse gas emissions.

Regarding Maine DEP's proposed revisions to their aftermarket converter requirements, MECA has supported ARB's aftermarket converter regulations for over 20 years, dating back to their original regulations for replacement converter certification in August 1988. MECA and our member companies actively participated in the regulatory process leading up to California's most recent amendments to their aftermarket converter standards implemented in 2009, including providing staff with comments regarding the capabilities of advanced aftermarket converter technologies. We commend the Maine DEP for recognizing the opportunity to significantly reduce emissions from the existing light-duty passenger car and truck fleet by applying the types of advanced catalyst technologies that are being used on all new vehicles sold since 2004 under ARB's LEV II light-duty vehicle program to aftermarket converters.

To meet the durability requirements for new aftermarket converter catalysts of 50,000 miles, catalyst manufacturers have developed technologies based on more thermally durable materials. To ensure that catalysts are compatible with the OBD II system and do not cause the vehicle's malfunction indicator lamp (MIL) to illuminate when the catalyst is functioning properly, manufacturers have developed advanced catalyst-coating practices and implemented tight quality control procedures in their processes. These advances result in catalysts that can survive high temperature exposure and deliver the required performance over a longer useful life. MECA member companies have certified and continue to obtain ARB approval for new

technologies to broaden the availability of aftermarket converters that comply with the latest requirements.

The benefits of applying the most advanced aftermarket converters on non-OBD vehicles was demonstrated by ARB staff through vehicle tests and presented in the staff report supporting their 2009 amendments. After approximately 8000 miles of mileage accumulation, the advanced catalysts resulted in 50-75% lower emissions of all three criteria pollutants compared to the aftermarket catalyst technology sold previously in California. Furthermore, the advanced catalysts demonstrated far better durability, resulting in 60% less deterioration in hydrocarbon (HC) emissions and 75% less deterioration in NOx emissions after mileage accumulation relative to today's aftermarket converters sold for pre-OBD vehicles outside of California. MECA member companies have recently completed their own test program that compared the emission reduction benefit of fully-aged California and federal aftermarket converters. After only 25,000 miles of equivalent aging, the ARB converters emitted 77% less NOx, 60% less HC, and 63% less CO than the equivalently aged EPA converters. The emission benefits of the ARB aftermarket converters were even more dramatic after 50,000 miles of aging. The results of this study have been submitted to the Society of Automotive Engineers (SAE) for publication in April 2013.

In summary, there are significant opportunities to reduce both criteria pollutant and greenhouse gas emissions from the transportation sector through the design of fuel-efficient powertrains that include advanced exhaust emission controls for meeting even the most stringent criteria pollutant standards that are included in the Maine DEP's proposed amendments to the LEV program. MECA believes that advanced emission control systems have a critically important role in current and future policies that aim to reduce mobile source criteria pollutant and greenhouse gas emissions. These advanced exhaust and evaporative emission control technologies will allow all current and future high-efficiency powertrain options to comply with the Maine DEP's LEV criteria pollutant standards, thus enabling these powertrains to be viable options for complying with existing and proposed state greenhouse gas pollutant standards.

MECA commends the Maine DEP for taking important steps through its proposed amendments to its LEV program to reduce criteria pollutant and greenhouse gas emissions and to improve fuel economy from light-duty vehicles in the state. Furthermore, we applaud the agency for their leadership in taking the additional steps to apply the best aftermarket converter technology to the state's existing light-duty vehicle fleet. Together, these new standards will provide consumers with the next generation of light-duty vehicles, designed to reduce multiple pollutants, while preserving vehicle choice and saving money. Our industry is prepared to do its part to deliver cost-effective, advanced emission control technologies to the marketplace.

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