

**WRITTEN COMMENTS OF THE  
ADVANCED ENGINE SYSTEMS INSTITUTE  
ON CALIFORNIA AIR RESOURCES BOARD'S  
MOBILE SOURCE STRATEGY  
DISCUSSION DRAFT**

*October 19, 2015*

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The Advanced Engine Systems Institute (AESI) is pleased to provide comments today in support of the Air Resources Board (ARB) Mobile Source Strategy Discussion Draft.

AESI represents emission control manufacturers in an industry employing more than 65,000 people in the U.S. We would like to extend our thanks and appreciation to ARB and to the ARB staff for their work in preparing this strategy and to express our strong support for an integrated approach to air quality and greenhouse gas reduction planning that decreases health risks, fights climate change and reduces petroleum consumption over the next 15 years. Such an approach will be essential for ARB, in cooperation with engine and vehicle manufactures, to achieve fully its multi-pollutant goals and benefits in the years ahead. We commend ARB for its longstanding leadership in this area and look forward to working with ARB in the future.

An integrated strategy is essential for California to continue making cost-effective progress in reducing the number of Californians that are living with unacceptable air quality. Such a strategy must be aimed at accelerating the statewide adoption of emission control and efficiency technologies that will save consumers money on their fuel bills, reduce pollution and improve energy and environmental security. AESI stands ready to work with ARB in achieving its goals through our innovative research and development programs and a decades-long commitment to delivering quality devices, products and systems.

Mobile sources continue to contribute approximately 80 percent of smog-forming nitrogen oxide (NO<sub>x</sub>) emissions, 95 percent of diesel particulate matter emissions, and 50 percent of GHG emissions. Obviously, there is more that can and should be done to reduce pollution from the transportation sector for both the on-road and the off-road sectors. In particular, heavy-duty vehicles represent the largest opportunity for achieving NO<sub>x</sub> reductions from the transportation sector and especially for off-road equipment. Such reductions could be cost-effectively achieved through national standards for heavy-duty on-road and off-road diesel engine applications.

With regard to the heavy duty on-road sector, AESI supports ARB's plan to strengthen the NO<sub>x</sub> standard. ARB is considering setting a standard of 0.02 grams/brakehorsepower-hour (g/bhp-hr), which AESI believes can be, working closely with our customers, both achievable and cost effective, particularly when compared to the costs of NO<sub>x</sub> reductions from other source categories. ARB's strategy calls for on-road engine technology approximately 90 percent cleaner than today's engines, and clean, renewable fuels for half the fuels burned. To demonstrate the feasibility of achieving these low NO<sub>x</sub> levels from various types of heavy-duty engines, ARB and MECA are partnering on a test program at Southwest Research Institute. The preliminary indications from this research are quite promising, but it is increasingly clear that

achieving this low level will require a variety of innovative strategies. These may include reducing NO<sub>x</sub> during low speed and cold-start conditions, use of advanced substrate and catalyst technologies and new thermal management technologies, using exhaust heat capture to activate catalytic controls, and a variety of heating and insulation strategies.

AESI believes that off road mobile sources represent a substantial opportunity for significant emission reductions. The ARB mobile source strategy includes off-road control measures designed to accelerate the penetration of zero and near-zero emissions equipment and to promote efficiency gains through the use of autonomous vehicles, worksite efficiencies and connected vehicles. However, the strategy does not include support for demonstration of low NO<sub>x</sub> control technologies on off-road sources or for petitioning EPA to tighten emission standards from off-road equipment beyond Tier 4.

In its 2012 Vision Document, ARB discussed the need to develop off-road engines meeting a 0.12 bhp-hr NO<sub>x</sub> limit. AESI suggests that ARB consider including this element in the mobile source strategy. Also, ARB could fund an off-road low-NO<sub>x</sub> demonstration program and consider requiring on-board diagnostics that are similar to the ARB heavy-duty highway requirements. Such in-use testing and OBD will ensure that the required emissions performance of off-road vehicles continues over the regulated life of the equipment or vehicle.

AESI would also like to suggest that cargo areas, including ports and their surrounding areas, provide one of the best opportunities to reduce emissions because of their high concentrations of mobile and stationary sources and because they are at the center of economic growth. Mobile source engines of all kinds, ranging from trucks and cranes, to marine vessels and locomotives, congregate in areas such as the port of Los Angeles, where they contribute significantly to non-attainment. It will be essential for any effective mobile source strategy to take the off-road sources at such ports fully into account and take actions to deploy and apply on-road control strategies and technologies to reduce emissions from those sources.

AESI urges ARB to specify NO<sub>x</sub> and PM reduction pathways in its final Mobile Source Strategy Report that demonstrate further emission reductions from off road engines and to petition U.S. EPA to consider tightening off-road NO<sub>x</sub> and PM emission standards beyond Tier 4.

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