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## **COMPREHENSIVE STUDY FINDS SUBSTANTIAL EMISSIONS AND HEALTH BENEFITS FROM US 2007/2010 AND EURO VI/6 DIESEL ENGINES**

(Boston, December 23, 2015) The most comprehensive examination to date of the emissions and health effects of new technology heavy duty diesel (NTDE) engines – engines meeting the US 2007/2010 and EURO VI/6 fuel and emission standards – has demonstrated dramatic improvements in emissions and the absence of any significant health effects (especially cancer). In the newly released *Executive Summary of the Advanced Collaborative Emissions Study (ACES)*, the Health Effects Institute (HEI)<sup>1</sup> concludes that “the overall toxicity of exhaust from modern diesel engines is significantly decreased compared with the toxicity of emissions from traditional-technology diesel engines.” The ACES Executive Summary, and links to all other reports of the project, can be found at the HEI website (<http://pubs.healtheffects.org/view.php?id=447>).

***Low Sulfur Fuels and New Emission Control Technologies the Key*** Overall, the ACES results show that the aftertreatment technologies used in such modern diesel engines are highly effective and that they meet — and exceed — the reductions mandated by U.S. and EURO regulations. The study reports the effectiveness of diesel particulate filters in reducing particulate matter (PM) emissions by more than 90% and of selective catalytic reduction systems in reducing smog-forming nitrogen oxide (NO<sub>x</sub>) emissions by 94%. Emissions of more than 300 other compounds — some with known carcinogenic and toxic properties — were also significantly reduced compared with exhaust from older diesel engines. This combination of new technology enabled by ultra low sulfur diesel fuel (10 ppm sulfur) meets US 2007/2010, EURO VI/6, China 6, and Bharat Stage VI standards. These new engines move well beyond the previous diesel engines (e.g. US 2004, EURO IV/4 and V/5 – and the equivalent China 4 and 5 and Bharat Stage IV and V) to substantially reduce both PM and NO<sub>x</sub> exposures.

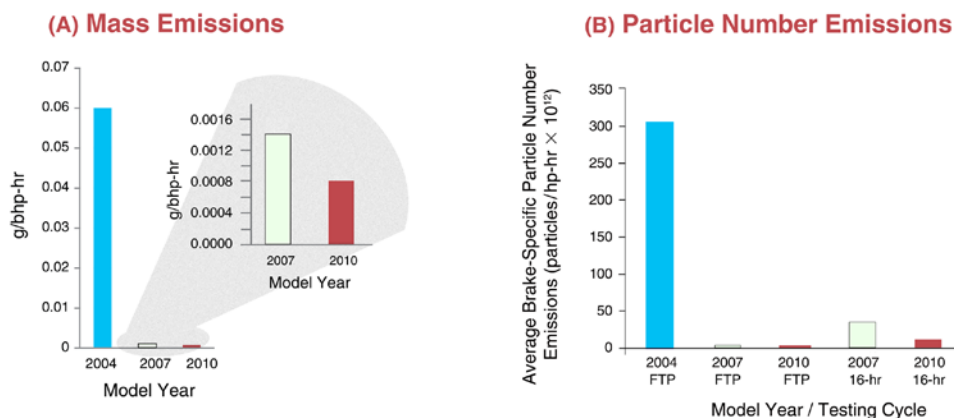
ACES reported as well that lifetime exposure to NTDE did not cause cancer in laboratory rats, unlike exposure to traditional-technology diesel exhaust from older engines, which is known to cause lung tumors under similar conditions.

The ACES results are expected to play an important role in future risk reviews of diesel engines by international and US agencies. “We are already seeing a transition in America’s roads with over 30% of the trucks and buses in use today meeting these new standards; these vehicles are now being subjected to significant in-use on-road compliance testing to ensure that these improvements occur outside the

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<sup>1</sup> The Health Effects Institute is an independent, non-profit research institute funded jointly by the US Environmental Protection Agency and industry to provide credible, high-quality science on air pollution and health for air quality decisions. HEI sponsors do not participate in the selection, oversight or review of HEI science, and HEI’s reports do not necessarily represent their views.

laboratory,” said Dan Greenbaum, President of HEI. “These results confirm the great strides that government and industry have made to reduce diesel risk – and argue for even greater efforts to accelerate the replacement of older diesel engines.”



**Figure 3. Substantial reductions in particle mass and number (ultrafine) emissions since 2004**

“These results are impressive for what they can mean for reducing exposure in the US and Europe, but also for the promise they hold in the developing countries of Asia and elsewhere in the world,” said Bob O’Keefe, Vice President of HEI and Chair of Clean Air Asia (Asia’s largest city network dedicated to clean air). “Countries like China and India are already moving toward implementing the ultra-low sulfur diesel fuel that is required for these new cleaner technologies.”

ACES was initiated by HEI and its partners and sponsors to undertake the detailed characterization of new technology diesel exhaust (NTDE) emissions and health effects, applying an extraordinarily rigorous engine drive cycle reflecting real world conditions to engines compliant with U.S. Environmental Protection Agency rules for model-year 2007 and 2010 heavy-duty diesel engines. The project was supported by a wide range of public and private entities<sup>2</sup> and conducted under the independent oversight of HEI and the Coordinating Research Council (an Atlanta-based non-profit organization specializing in emissions characterization).

The detailed results of the ACES studies are presented in a series of reports and peer-reviewed publications. The ACES Executive Summary, and links to all the other reports of the project, can be found at the HEI website (<http://pubs.healtheffects.org/view.php?id=447>).

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<sup>2</sup> The US Department of Energy, US Environmental Protection Agency, US Federal Highway Administration, California Air Resources Board, Engine Manufacturers Association, American Petroleum Institute, Coordinating Research Council, and manufacturers of emission control equipment