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Submitted Electronically: http://www.arb.ca.gov/lispub/comm2/bcsubform.php?listname=techfuel-report-ws&comm_period=1

RE: **Comments on the California Air Resources Board's Draft Technology Assessment: Lower NOx Heavy-Duty Diesel Engines**

The California Trucking Association (CTA) and the American Trucking Associations (ATA) are pleased to have the opportunity to review and comment on the California Air Resources Board's Draft Technology Assessment: Lower NOx Heavy-Duty Diesel Engines.[1] We appreciate staff's efforts in preparing the assessment and view the draft as a starting point for a discussion of this technology. The following comments reflect the experience and viewpoint of the trucking industry as they pertain to this technology and should be reflected in the assessment.

General Comment: Having gone through three rounds of reducing tailpipe NOx emissions in 2004, 2007, and again in 2010, the lessons learned from these prior regulatory actions remain fresh in the minds of the industry. Fuel economy penalties, increases in greenhouse gas emissions, reliability issues, and vehicle pre-buys and low-buys were among the significant unintended consequences. Another major factor was the cost of compliance. The cumulative vehicle surcharge for all three rounds was in excess of $21,000, more than four times EPA's projected cost of compliance.[2] Given EPA estimates fleets will pay an additional $14,000 for a new tractor-trailer combination meeting the Phase 2 standards, agencies must be sensitive to the cost impacts additional regulatory pursuits will have on the trucking industry.

Although CARB recently certified an 8.9 liter natural gas engine to an optional NOx standard of 0.02 g/bhp-hr, the ability to transfer this technology into the Class 8 truck sector remains unproven.[3] The

[1] CTA serves the commercial motor carrier industry in California and the companies that provide products and services to the trucking industry. ATA is the national trade association representing the American trucking industry and is a united federation of motor carriers and suppliers, state trucking associations, and national trucking conferences.
[2] Calpin, Patrick & Esteban Plaza-Jennings, A Look Back at EPA's Cost and Other Impact Projections for MY 2004-2010 Heavy-Duty Truck Emissions Standards, American Truck Dealers (February 2012).
[3] CARB Webpage: Heavy-Duty Engines and Vehicles, including Urban Buses, and Engines Used in Diesel or Incomplete Medium-Duty Vehicles of 8501-14000 Pound GVWR Executive Orders – 2016, http://www.arb.ca.gov/msprog/onroad/cert/mdehdehdv/2016/2016.php

prospect of a commercially viable diesel engine meeting a NOx standard that is as much as 90% below the current standard should not be a foregone conclusion. As identified in EPA's proposed Phase 2 rule,[4]

> If system designers push the NH_3 to NOx ratio higher to try and achieve the maximum possible NOx reduction, it could increase N_2O emissions. If EPA were to adopt a very low NOx standard (*e.g.*, 0.02 g/bhp-hr) over existing test cycles, some reductions would be needed throughout the hot portion of the cycle (although most of the reductions would have to come from the cold start portion of the test cycle)…. An increase in NH_3 to NOx ratio could also further reduce NOx emissions: however this would also adversely affect NH_3 slip and N_2O formation.

Both CTA and ATA are very interested in the CARB-led research taking place at Southwest Research Institute to investigate the feasibility of achieving lower NOx emissions.[5] While this evaluation is scheduled to be completed in late 2016, additional time will be needed to further develop and demonstrate any resulting technologies. In addition to the need to demonstrate the technical feasibility of meeting lower NOx emissions in the Class 8 sector, while at the same time achieving increasingly stringent GHG emission limits, the in-use performance of such an engine must be carefully evaluated to ensure it meets the reliability, performance and cost criteria of the purchaser. Otherwise, this pursuit will result in buyer avoidance and an increase in the overall age of the fleet. CTA and ATA recommend that CARB continue to carefully evaluate the cost, timing, and market readiness of emerging low-NOx technologies.

P. VI-I: The assessment incorrectly states the incremental cost of the SCR system added approximately $3,000 to $4,500 to the cost of the 2007 model year engine. Based on individual truck sales data and OEM sales documents, the American Truck Dealers determined that actual emissions-related surcharges for seven manufacturers of MY 2010 compliant heavy heavy-duty truck (i.e., in excess of MY 2007 costs) ranged from $7,736 to $9,283.[6] These actual cost increases for SCR-equipped trucks should be reflected in the assessment.

In addition, the assessment cites a written statement by the Manufacturers of Emission Control Association which claims an incremental cost estimate for future advanced on-road emission control systems is approximately $500 per vehicle. The inclusion of this estimate is curious given CARB's website indicates that the agencies research into low NOx control systems is currently identifying candidate systems for initial testing with a final report due by the end of 2016.[7] It does not appear that this cost estimate can be validated at this time and should not be included in the assessment until a more thorough technology assessment has been completed.

If you have any questions regarding these comments, please contact us at your convenience.

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[4] Federal Register, p. 40205.
[5] CARB webpage: Evaluating Technologies and Methods to Lower Nitrogen Oxide Emissions from Heavy-Duty Vehicles, http://www.arb.ca.gov/research/veh-emissions/low-nox/low-nox.htm.
[6] Calpin, ibid.
[7] CARB Website, *Evaluating Technologies and Methods to Lower Nitrogen Oxide Emissions from Heavy-Duty Vehicles* (accessed December 2015).

Respectfully,

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