CARB Comments on the Proposed Clean Trucks Plan Oxides of Nitrogen (NOx) Rule

December 6, 2022

Focus of Discussion

- California's Air Quality Challenges
- EPA Action is Clearly Needed
- Omnibus Standards, Expected CTP NOx Rule are Technically Feasible
- CARB Staff Comments on NPRM
- Concerns about Margins
- Emissions Impacts
- OMB Timely Action Needed

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Air Quality Challenges

- NOx emissions from heavy-duty (HD) trucks adversely affect the health of California residents
- Nearly 15 million Californians face the most extreme and persistently high ambient ozone levels in the nation
- Key challenges:
  - South Coast ozone
  - San Joaquin Valley PM2.5
- NOx emissions impair the State's abilities to meet the NAAQS for ozone and PM
- Significant NOx reductions needed to meet air quality goals for Ozone and fine particles

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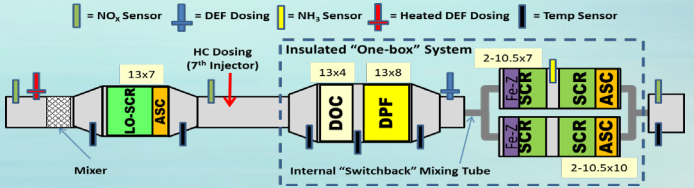
EPA Action is Clearly Needed

- **HD trucks are the largest source of NOx emissions in CA: ~ 1/3 of total statewide NOx**
- **California recently adopted the HD Omnibus regulation – effective December 2021**
  - Oregon, Vermont and Massachusetts have already adopted the Omnibus
  - New Jersey, New York, Washington and Colorado are in the process of considering the rule
- **Omnibus regulation only impacts new heavy-duty trucks that are sold in California**
  - Roughly 2,500 avoided premature deaths, and 2,000 avoided hospitalizations statewide over the life of the rule
- **Out-of-state trucks make up half of the total HD truck NOx emissions in CA**
- **Significant NOx reductions needed from federally certified HD trucks to attain air quality goals**

Standards are Technically Feasible

- **Extensive CARB-sponsored demonstration at SwRI since 2014**
  - Supported by federal / local air agencies and industry
- **SwRI testing demonstrated technical feasibility**
  - Tailpipe emissions were 90% percent lower than current standards at full useful life of 800k mi
  - Compliance with in-use standards over real driving cycles
  - Aftertreatment technology – similar to 2007/2010 technology
- **Enough lead time to optimize and integrate systems on truck**



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SwRI

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

MECA

South Coast AQMD

EATON
Powering Business Worldwide

Cummins

VOLVO
VOLVO GROUP

NREL
National Renewable Energy Laboratory

CHEDE-VII
CLEAN HIGH EFFICIENCY DIESEL ENGINES

Comments on NPRM

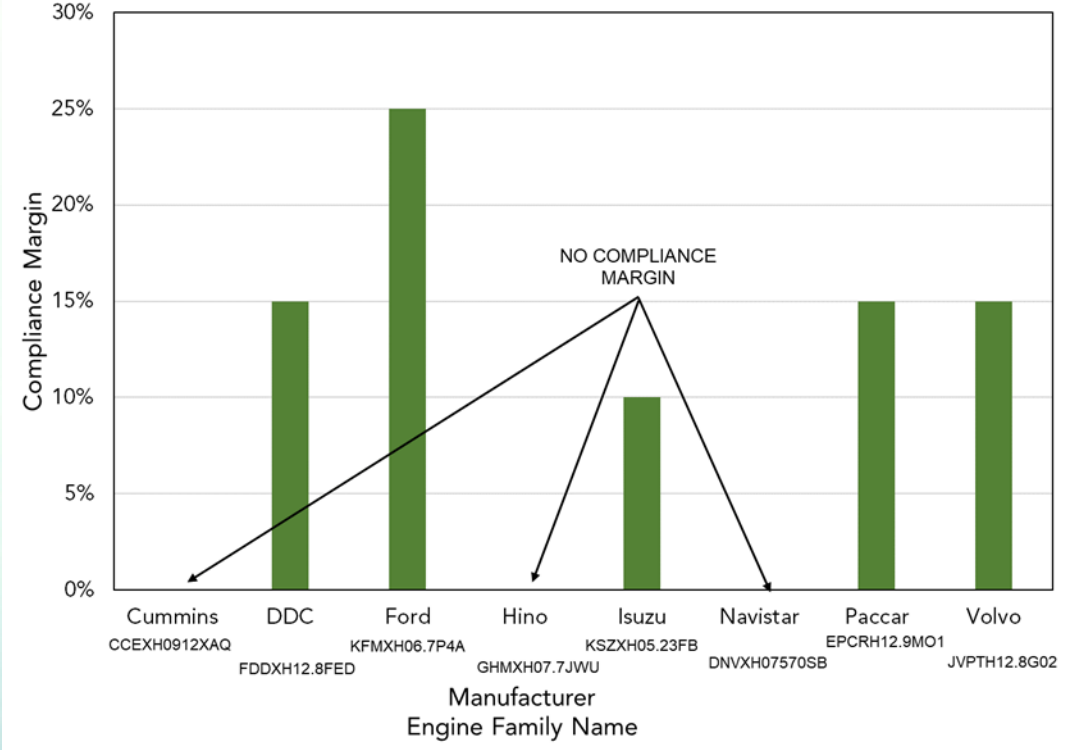
- **Proposed Option 1 Standards**
  - Technically feasible and closely aligned with Omnibus
- **Consider Option 1 for final rule with some modifications**
  - Further tighten the low load cycle standard (based on SwRI test data)
  - Remove unnecessary compliance margins provided for off-cycle standards for heavy heavy-duty engines
  - Strengthen SCR inducement strategy
- **Proposed Option 2 Standards**
  - Very weak – would undermine the maximum feasible emission reductions achievable
    - EPA estimated 22% less NOx benefits nationally compared to Option 1
  - CARB strongly opposes consideration of Option 2 for final rule

Other Concerns

- **Some stakeholders have lobbied EPA to weaken the CTP final rule**
  - By adding unnecessary compliance margins to the certification standards and proposing shorter useful life and warranty periods
  - Potential pre-buy/ no-buy scenario triggered by stringent regulations
- **CARB staff strongly opposes consideration of these requests**
  - Standards are feasible without additional margins
  - Many engine manufacturers have certified engines with no compliance margins in the past
  - SwRI program has demonstrated feasibility of Option 1 standards at 800,000-mile useful life without replacing the aftertreatment
    - HHD: useful life of 650,000 mi, warranty of 450,000 mi clearly feasible

Margins are Unnecessary

2010 through 2020 Model Year Lowest Value Compliance Margins for Each California Certified On-Road Heavy-Duty Diesel Manufacturer



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No Need for Additional NOx Standard Margin at Low Temp

- EMA sponsored research project using forced cooling to simulate low ambient temperature truck operations
- Results showed lower exhaust temperatures (lower catalyst efficiency) at ambient temperatures between 41-77 °F (5-25 °C)
- CARB staff looked at in-use data from real-life truck operations
  - Discrepancy between simulation results and exhaust temperature data from real-life truck operations
- CARB staff does not believe simulation models real-life truck operations; therefore, results should not be used to justify additional margin between 41-77 °F

Impacts on Emission Benefits

- Providing unnecessary large compliance margins would significantly dilute emissions benefits expected from the regulation
- The ultimate enforceability threshold in-use should be no more than 1.5 times the certification standard plus a 10 percent PEMS measurement allowance. Any other larger stack-up of in-use standards and allowances is padded with unnecessary compliance margin
  - Like Option 1 with modifications discussed above
- Finalizing weakened standards would make it more difficult for CA and other states to achieve attainment with the NAAQS
- CARB will struggle to align with CTP standards if they are too weak

Timely Action is Needed

- **While CARB staff believes standards more stringent than Option 1 are feasible, we urge OMB to approve the CTP in an expeditious manner**
  - State actions alone are insufficient to protect our communities from unhealthy air pollution
  - CA and other states are depending on EPA's rulemaking to get critically needed NOx reductions – to meet NAAQS
- **CARB also urges EPA to fully grant California the waivers for the Omnibus, Step 1 Warranty and Advanced Clean Trucks regulations**
  - Manufacturers could use the certainty
  - Without the waiver and model year 2024-26 standards, California will face a significant emission reduction deficit in our State Implementation Plan, will have to make it up with other more draconian measures

Questions?