

Suppliers Supporting EPA's Heavy-Duty Trucks Regulation

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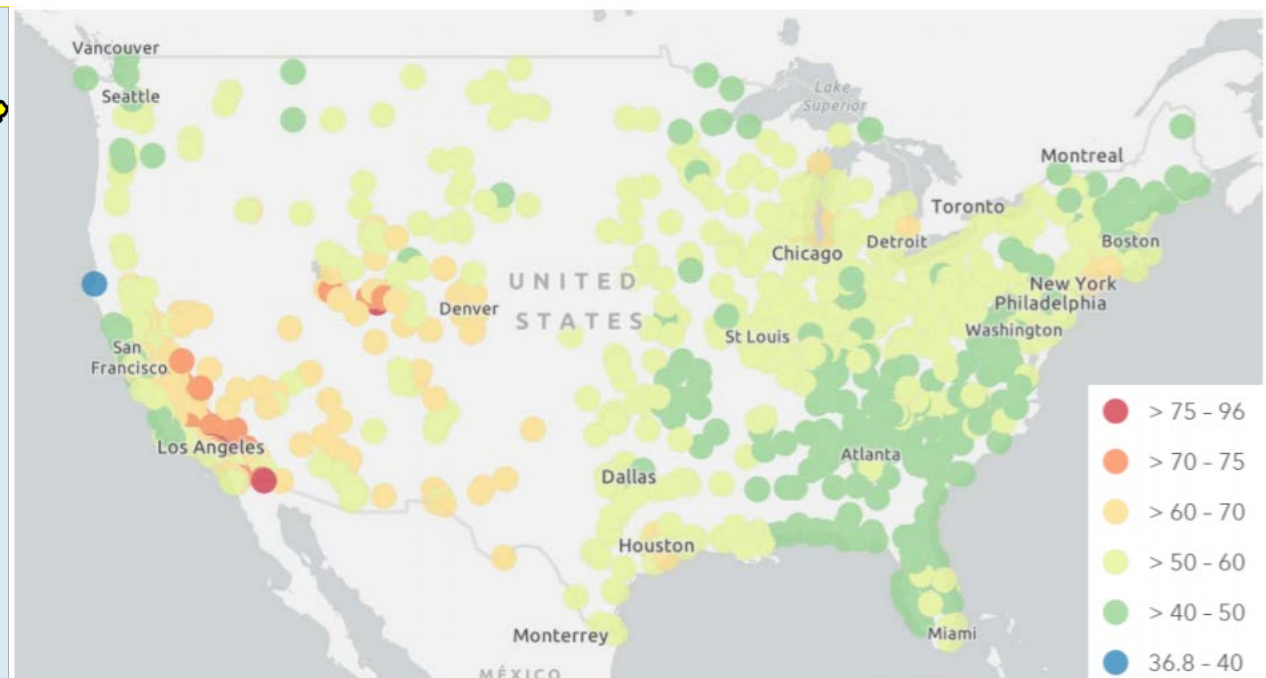
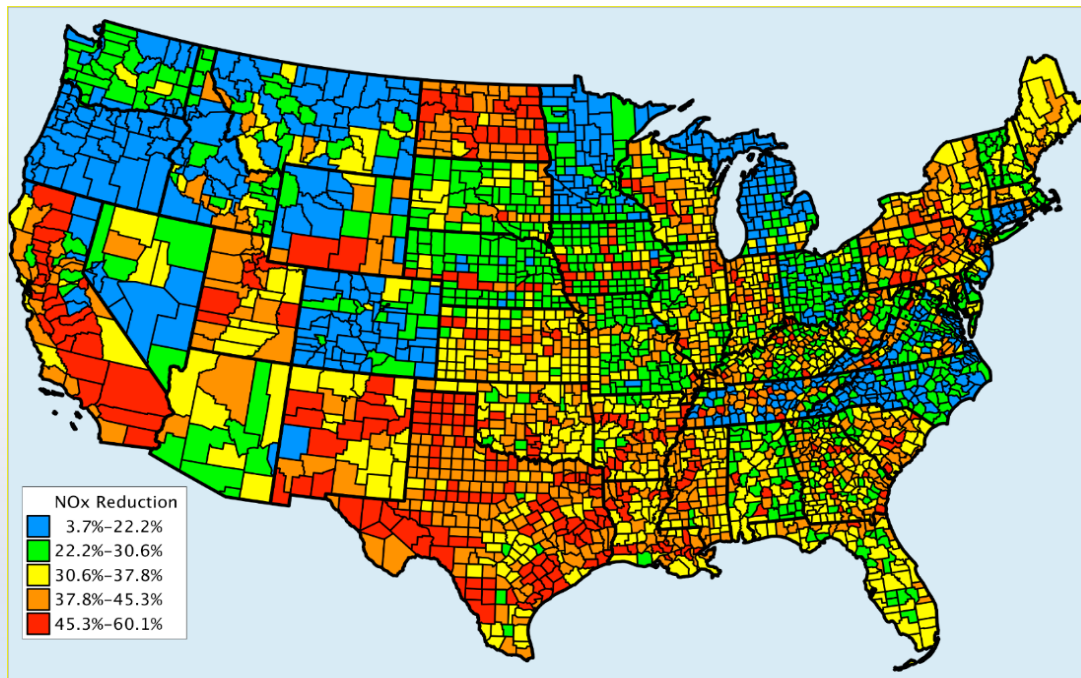
Today's Focus

- Clean mobility suppliers represent over 300,000 jobs—many of which are high paying union jobs—in the US and contributing hundreds of billions of dollars in economic activity
- Clean mobility suppliers are committed to the Biden Administrations transportation climate and air quality goals
- Heavy-duty trucks account for more than half of US mobile source NOx emissions in 2020 with disproportionate impacts to frontline communities
- Suppliers have made substantial investments in technologies that simultaneously deliver 90% lower NOx and reduced GHG emissions
- Proposed standards can be met cost effectively, and application of familiar technologies reduces risk of pre-buy

MECA – Technologies for Clean Mobility

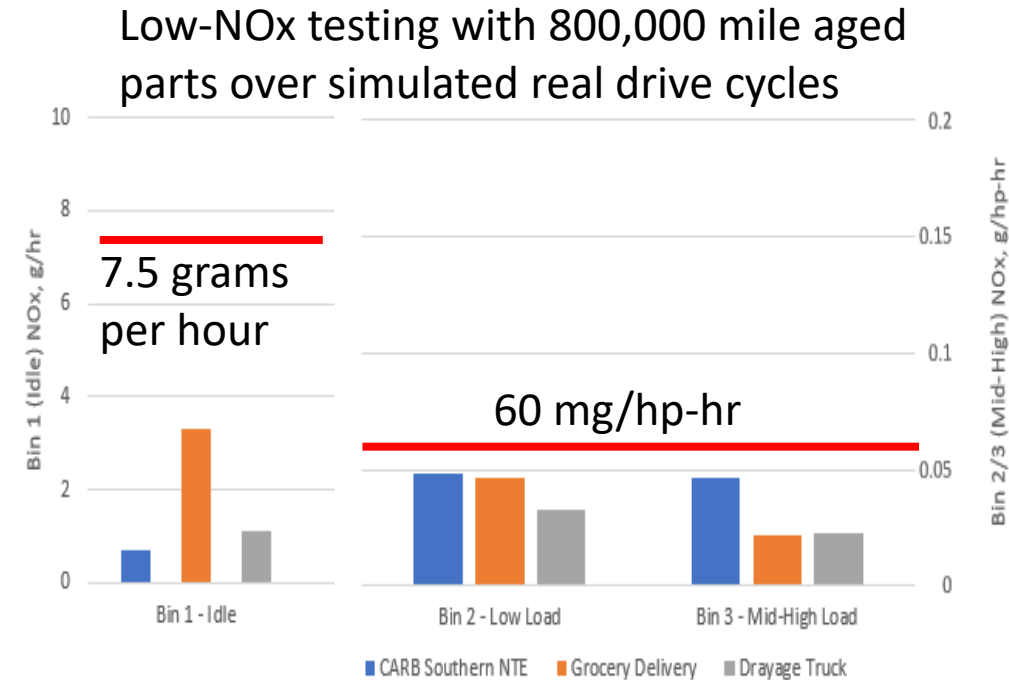
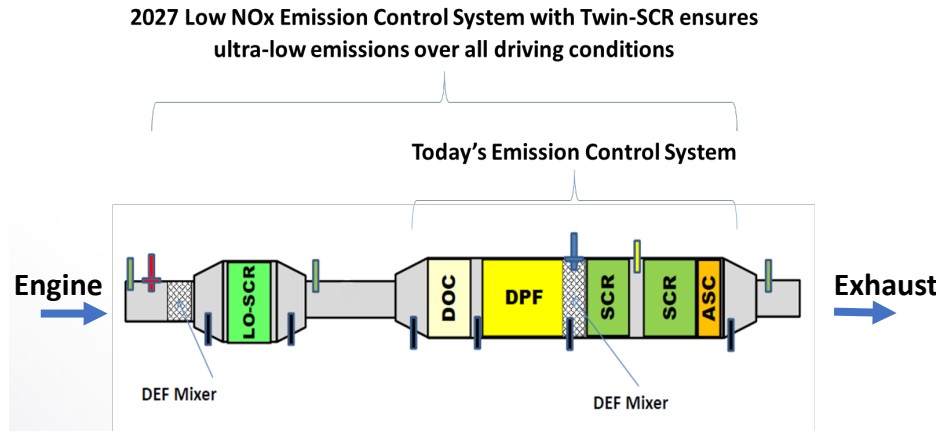
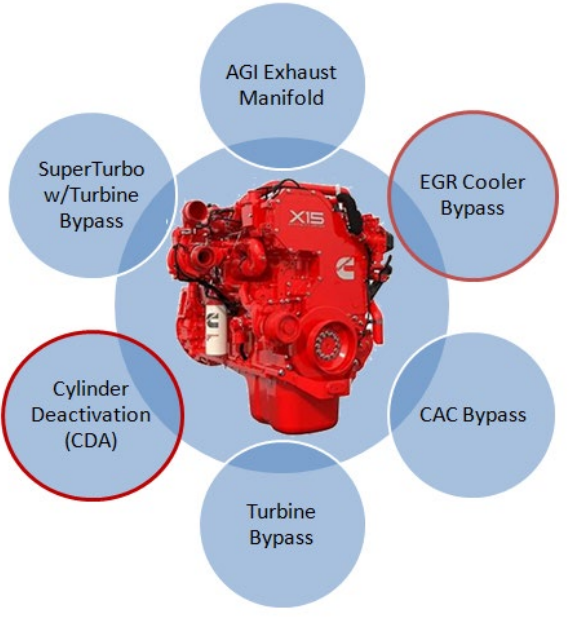


EPA's Truck Rule can Significantly reduce NOx and benefit ozone nationally by 2035



- MECA's AQ modeling demonstrates that:
 - Reduction of 329,000 tons per year in 2035
 - Most monitors in eastern US attain 70 ppb ozone NAAQS under national low NOx scenario
 - Greatest ozone benefit from trucks in urban areas and along highway corridors

Technologies Simultaneously Deliver 90% Lower NOx and Reduced GHG Emissions



The most comprehensive technology demo to precede a rulemaking

Multiple compliance pathways have been shown to reduce NOx by 90% under all operating conditions, including proposed stringent in-use compliance standards

Truck manufacturers and operators have 20 years of experience with aftertreatment hardware and maintenance of systems shown above

Several Estimates Agree on Costs for Hardware to Achieve Standards at Longer Durability

Source	Elements Included in Incremental Cost for Line-Haul Truck	Incremental Cost
EPA Proposed Options 1-2	Hardware + Warranty + Durability Total Cost	\$3,200 - \$3,900
ICCT	Hardware Costs	\$2,170 - \$3,239
MECA	Hardware Costs 600k Mile Warranty/800k Mile Durability Cost Total	\$1,500 - \$2,050 \$2,000 - \$2,750 \$3,500 - \$4,800
CARB	Hardware Costs 600k Mile Warranty/800k Mile Durability Cost Total	\$6,159 \$2,319 \$8,478
EMA-ACT	Hardware Costs 600k Mile Warranty/800k Mile Durability Cost Total	\$8,162 \$32,496 \$40,658
EMA-Ricardo	Hardware + 350k Mile Warranty Total Cost + 650k Mile Durability	\$18,007

*Estimation of costs associated with longer warranty has larger range due to a variety of assumptions

Suppliers Not Anticipating Pre-Buy Behavior Due to NPRM

Demonstration testing to support regulation includes evolved technologies that are currently installed on heavy-duty trucks and combine strategies successfully implemented for light-duty vehicles

Longer warranty requirements provide assurance to end-users that vehicles will have robust designs underpinned by a promise to repair

Research shows no relationship between the implementation date of regulations and truck sales

- ERM analysis concludes “no material impact of the 2004, 2010, 2007, and 2014 HDV emission regulations on industry employment.”
- Sales patterns suggest economic conditions (e.g., recessions) play larger role than emission regulations.
- EPA analysis in RIA found low-buy for 2007 and both pre-buy and low-buy for 2010 only for Class 8 trucks with short-lived effects on the order of months.
- <https://www.erm.com/hdv-prebuy-report-oct2022/>

Summary

National truck standards that achieve a 90% reduction in NOx and further reduction in CO₂ can be cost effectively implemented starting in MY 2027

- Suppliers have made significant investments in technology that has been comprehensively demonstrated in a multiagency and industry program

2027 technology is evolution of familiar technology with improved durability thus reducing the risk of significant pre-buy

Rule projected to achieve significant cost-effective NOx and PM reduction benefits across the U.S.

Rule will achieve cost savings as other major global regions such as Europe and China harmonize to US standards and technologies

Will provide regulatory certainty for industry by aligning NOx and GHG standards in 2027 and 2030

Rule supports jobs and investments

- Tens of thousands of supplier jobs dedicated to technology commercialization by 2027
- Supplier investments in GHG and ZEV technology