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Cleaner Cars, Cleaner Fuel, Cleaner Air: The Need for and Benefits of Tier 3 Vehicle and Fuel Regulations

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ECOS Air Committee
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NACAA Report on Tier 3 Vehicle and Fuel Standards

- *Cleaner Cars, Cleaner Fuel, Cleaner Air: The Need for and Benefits of Tier 3 Vehicle and Fuel Regulations*
- Released October 31, 2011
- Provides the results of an analysis of the needs, benefits and costs of NACAA's recommendations to the EPA Administrator in June 2011
  - Propose this year and finalize in 2012 federal "Tier 3" vehicle standards
  - Model the program on California LEV III
  - Include improved tailpipe emissions standards for nitrogen oxide (NOx) and volatile organic compounds (VOCs) and an average gasoline sulfur concentration of 10 parts per million (ppm)

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The Problem

- Air quality in the U.S. has improved substantially over the years, but serious problems remain
- Motor vehicle emissions continue to be a key contributor to these problems
- U.S. has the strongest motor vehicle pollution control program in the world and the largest vehicle population

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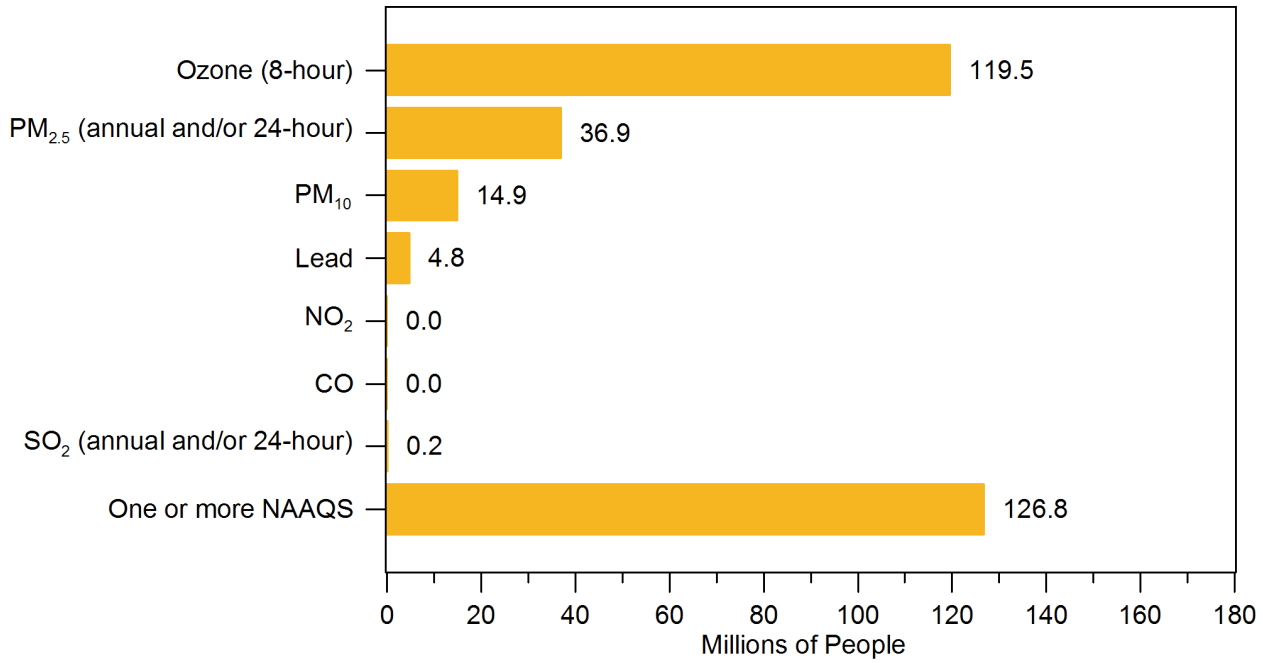
We Continue to Face Significant Air Pollution Challenges



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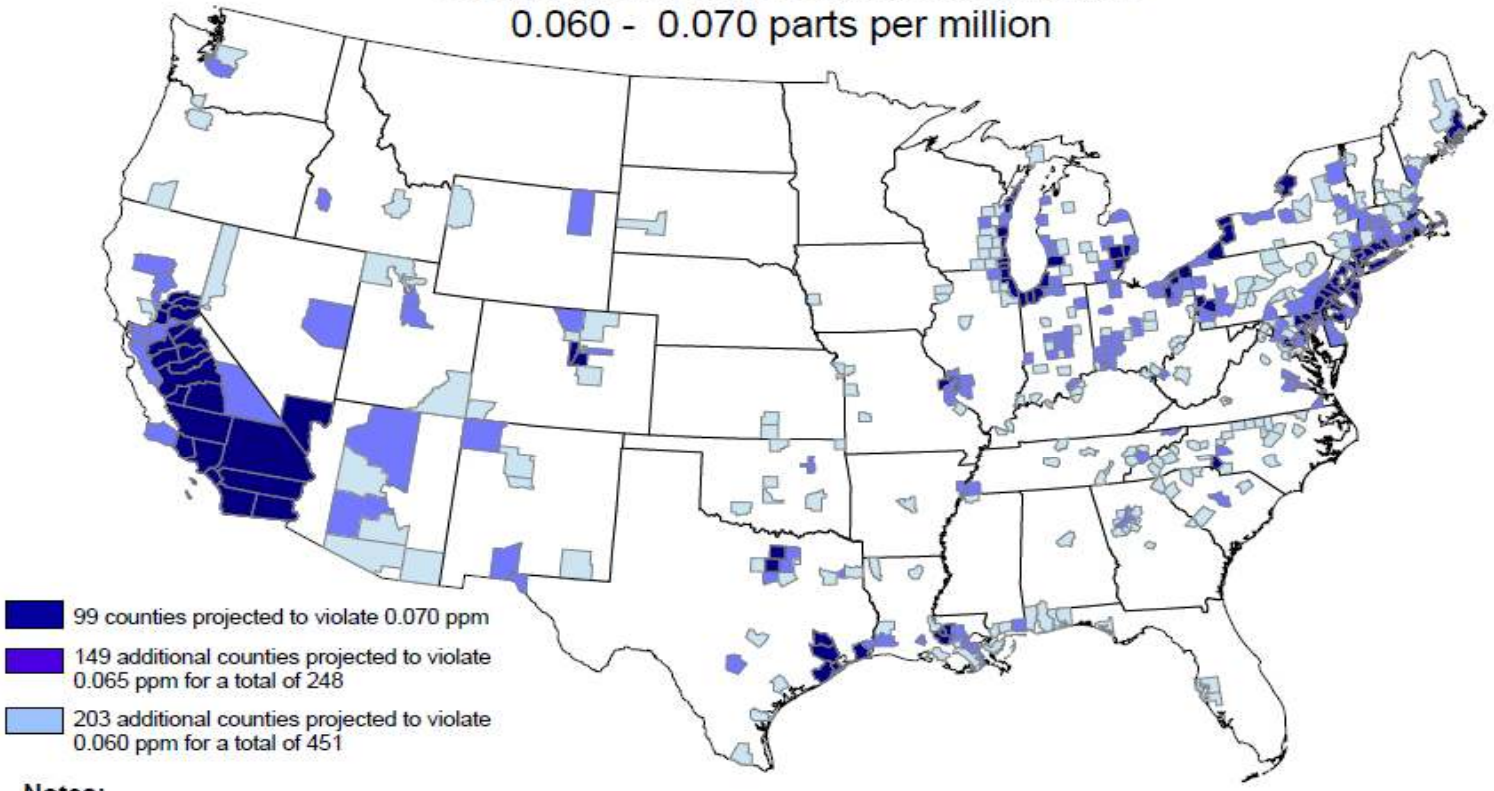
Counties With Monitors Projected to Violate Primary 8-hour Ground-Level Ozone Standards in 2020
0.060 - 0.070 parts per million



Notes:

1. The modeled emissions in 2020 reflect the expected emissions reductions from federal programs by 2020 including: the Clean Air Interstate Rule, the Clean Air Mercury Rule, the Clean Air Visibility Rule, the Clean Air Nonroad Diesel Rule, the Light-Duty Vehicle Tier 2 Rule, the Heavy Duty Diesel Rule, the proposed rules for Locomotive and Marine Vessels and for Small Spark-Ignition Engines, and an estimate of State-level mobile and stationary source controls that were projected to be needed to attain pre-existing PM 2.5 and ozone standards.
2. Controls applied are illustrative. States may choose to apply different control strategies for implementation.
3. EPA did not model future violations outside the continental U.S.
4. EPA is proposing to determine compliance with a revised primary ozone standard by rounding the 3-year average to three decimal places.

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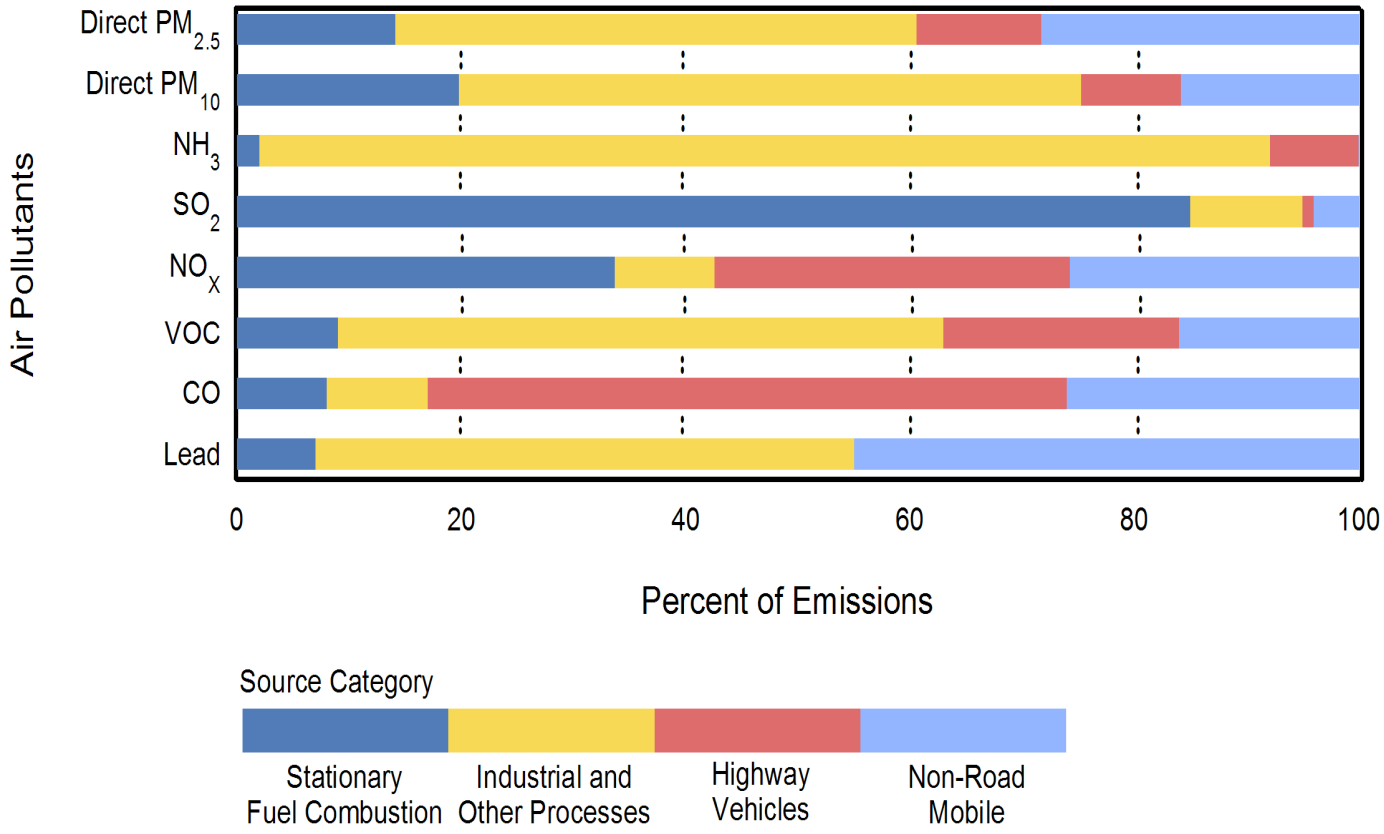
Vehicles Remain a Major Source



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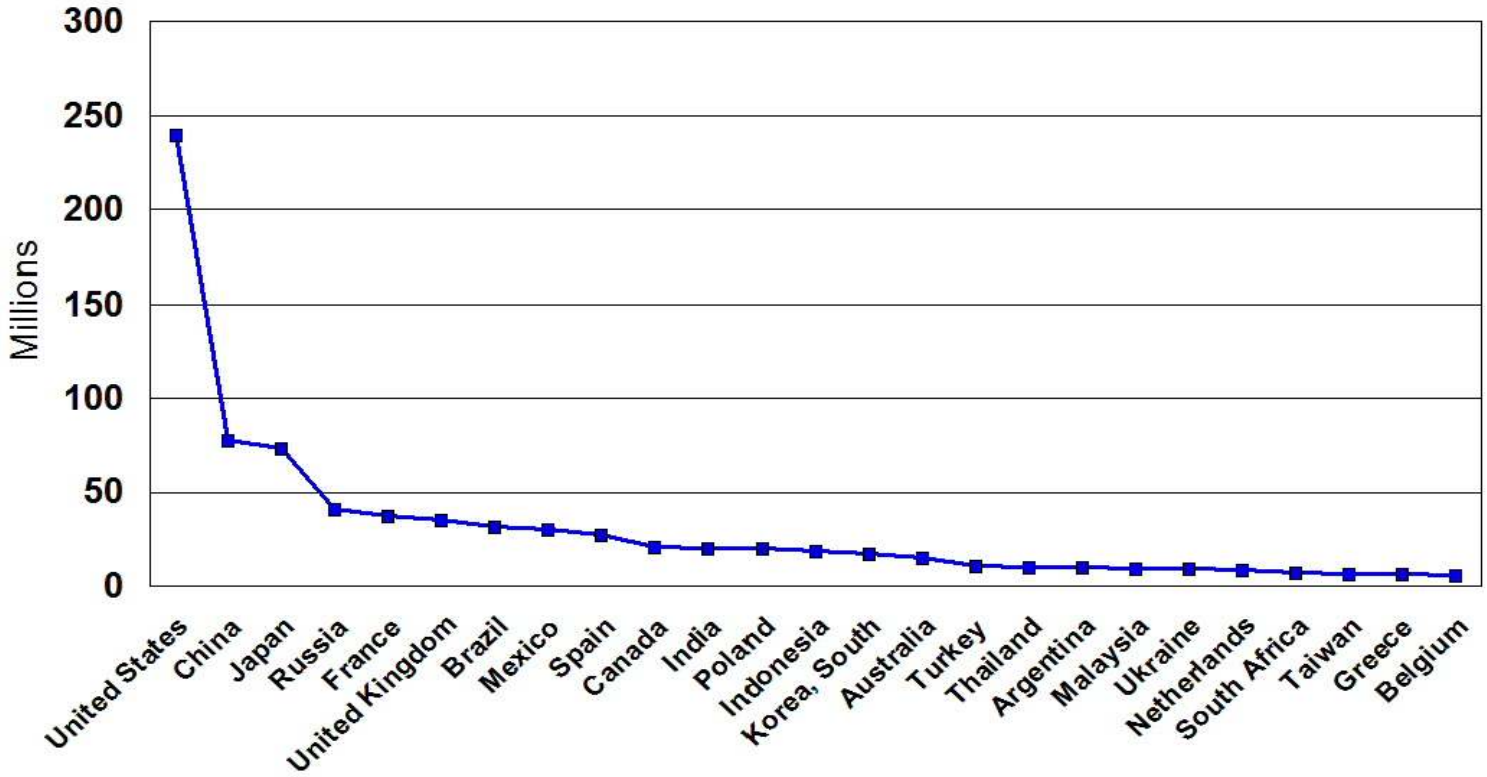
Car Truck and Bus Population in 2010
(25 Largest Countries)



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Technology Exists to Substantially Reduce Emissions Further

- We can address our continuing air pollution problems by taking advantage of improved vehicle emissions control technologies already in the marketplace
- Potential Tier 3 technologies are almost entirely the same as those already on California PZEV/SULEV (i.e., EPA Tier 2, Bin 2) models of today
- Estimated cost ~ $150 per vehicle → less than 1% of the average cost of a new car

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Low-Sulfur Gasoline Is Key

- To achieve tighter emissions standards at minimal cost, and to take advantage of already-available technologies, EPA must reduce average gasoline sulfur levels from the current 30 ppm to about 10 ppm
- California's gasoline already achieves this level, as does gasoline in various other nations, and there is a global movement towards it
- Lower sulfur in gasoline will result in immediate improvement in the effectiveness of NO_x controls on all existing Tier 2 cars
- The emissions impact will be equivalent to taking over 33 million cars off the nation's highways in 2017
- Estimated cost ~ 0.8 cents per gallon

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Cost Effectiveness of Tier 3 Low-Sulfur Gasoline Relative to Other NOx Reduction Measures

NO_x Reduction Measure	Cost Per Ton of NO_x Reduced
Tier 3 Low-Sulfur Gasoline	$3,300
Oil/Gas Boilers Serving EGUs	$1,100 - 8,700
New Small Gas Boilers	$3,300 - 16,000
Municipal Waste Incinerators	$2,140 (SNCR)
HEDD EGUs	$45,000 - $300,000 per unit
Stationary Generators	$39,700 - 79,700
Minor New Source Review	$600 - $18,000

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Emissions Reductions

- By 2030, the Tier 3 program recommended by NACAA is expected to reduce mobile source NOx, VOC and CO emissions by 29%, 26% and 38%, respectively
- 10-ppm sulfur gasoline will not only enable tighter emissions standards for new (Tier 3) vehicles, but will also yield immediate reductions from the existing fleet, most significantly for NOx
  - In 2017, 300,000 tons of NOx emissions will be reduced → 260,000 tons from pre-Tier 3 vehicles using 10-ppm sulfur gasoline
  - We know of no other single strategy for NOx that will achieve as significant and timely emissions reductions

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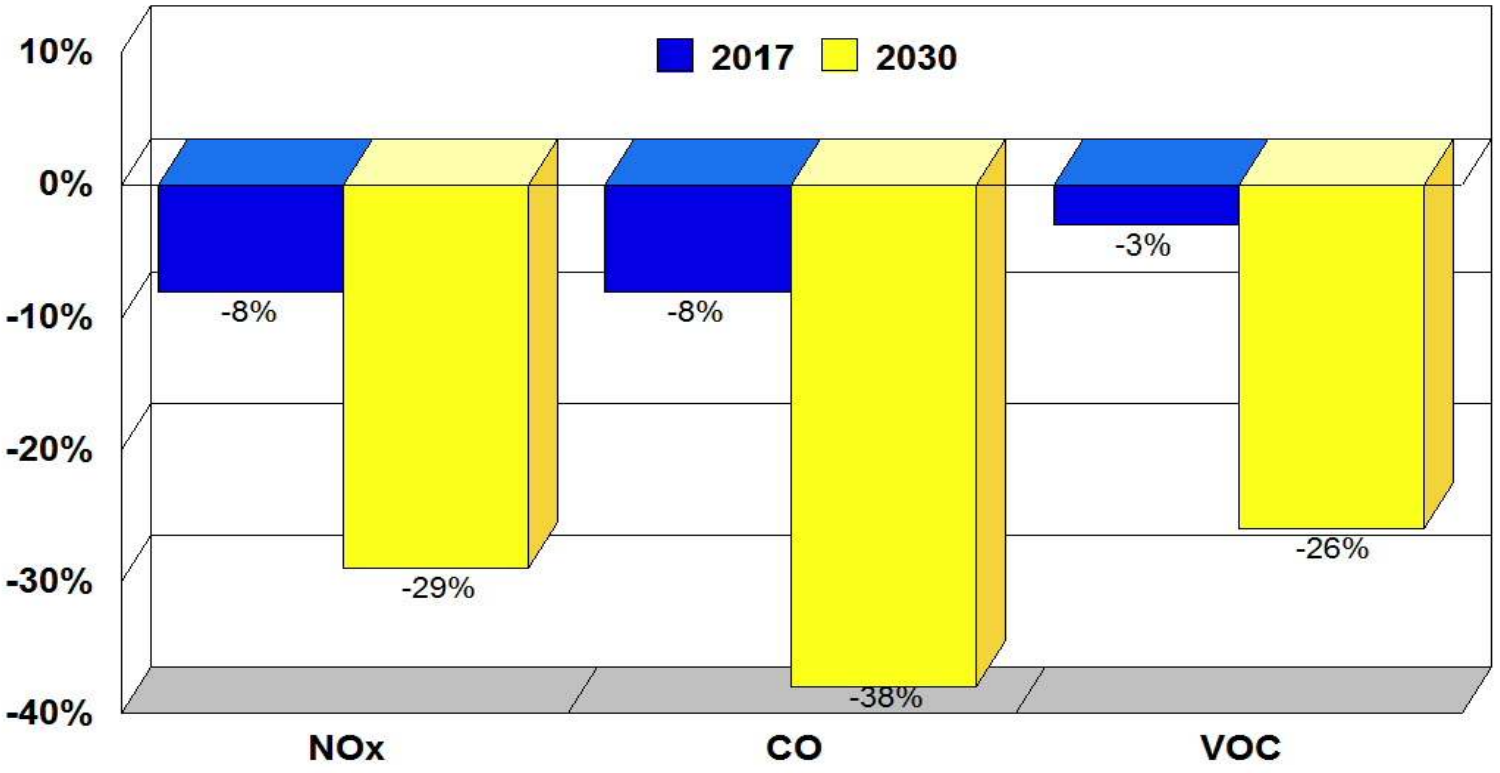
Overall Emissions Reductions From Onroad Mobile Sources



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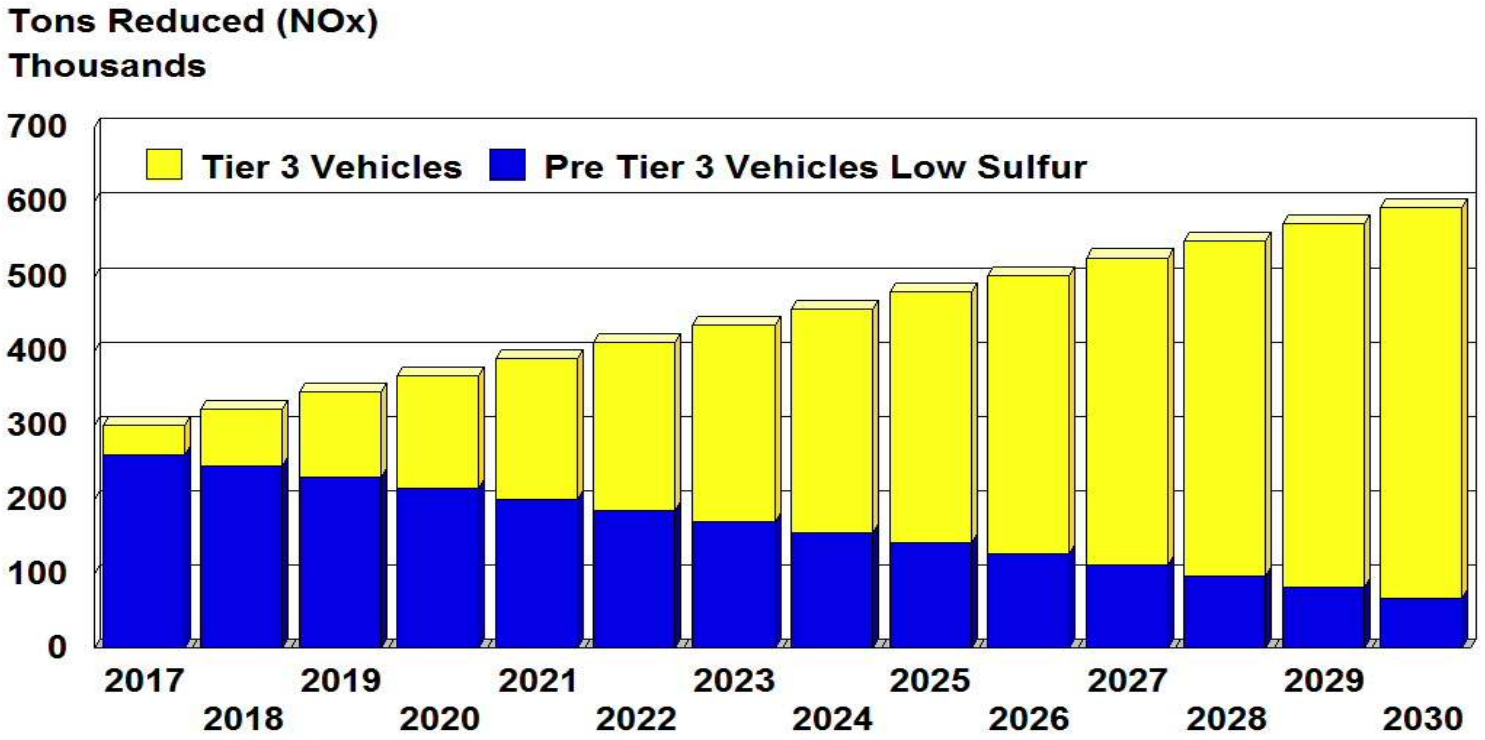
Emissions Reduction Benefits From Tier 3 Vehicle and Fuels Requirements



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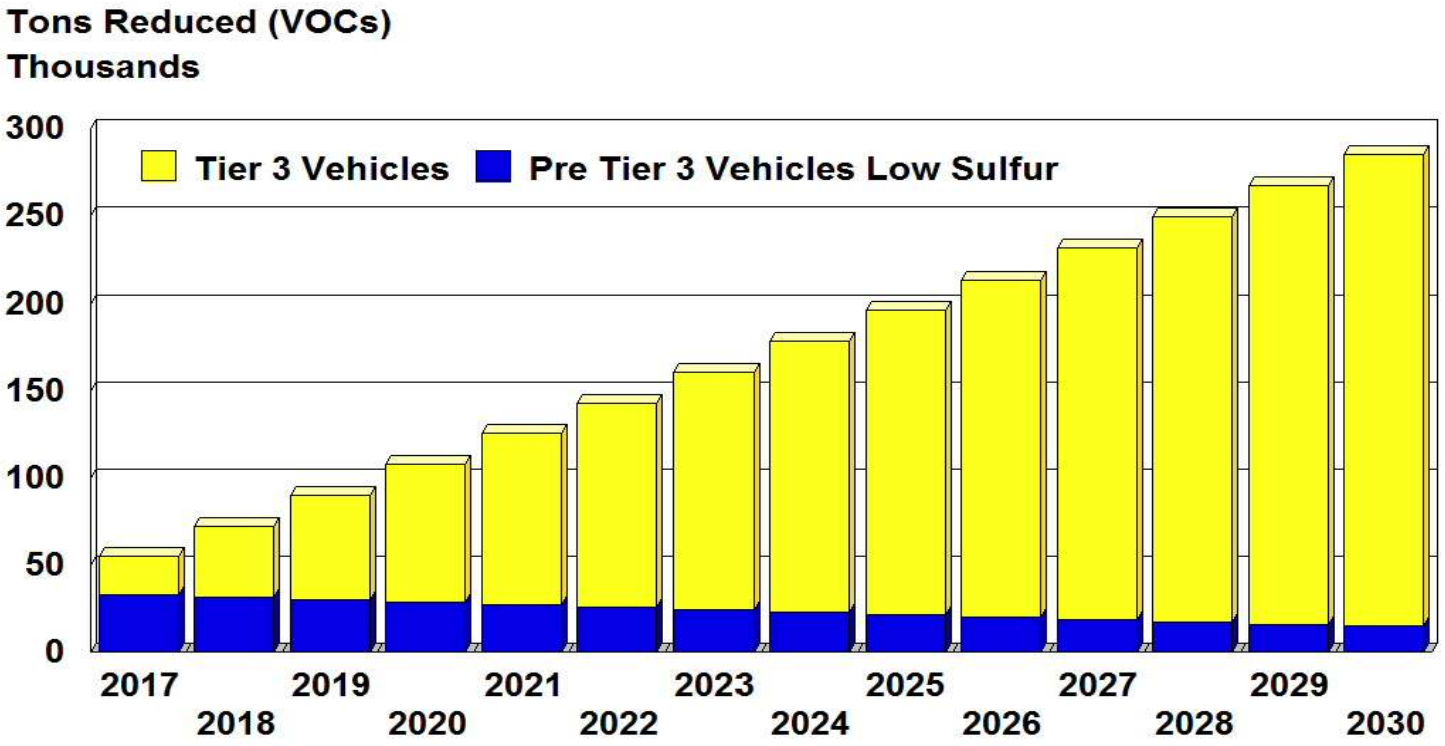
Emissions Reduction Benefits From Tier 3 Vehicle and Fuels Requirements



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Summary of Benefits of Tier 3 Program with Vehicle Standards Modeled on CARB LEV III and Average Gasoline Sulfur of 10 ppm

- The program would substantially reduce vehicle emissions by 2030 and result in a significant reduction in ozone levels across the U.S.
  - NOx ↓ 29%, VOC ↓ 26%, CO ↓ 38%
- 10-ppm sulfur gasoline would bring about immediate reductions from the Tier 2 fleet
  - Equivalent to removing 33 millions cars from the roads in 2017
- Benefits come at modest cost
  - < 1 penny a gallon for 10-ppm sulfur gasoline
  - Approximately $150 per vehicle
- It's a highly cost-effective program that will yield substantial health and welfare benefits

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For Further Information:

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