

Tier 3 Vehicle and Fuel Standards

February 2016





Overview

- Overview of the Tier 3 Program
 - Tier 3 Vehicle Standards
 - Tier 3 Fuel Standards
- Emissions and Air Quality Impacts
- Compliance Schedules



Tier 3 Overview

- Like Tier 2, a systems approach to reducing motor vehicle pollution: more stringent vehicle standards enabled by gasoline sulfur control
- Similar structure to Tier 2, with standards that apply to all light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles, as well as the fuel they use.
- Vehicle standards that go beyond the stringency of the Tier 2 standards, but like Tier 2:
 - Create a harmonized vehicle program
 - Coordinated with California Low Emission Vehicle (LEV) III standards
 - Enable auto industry to produce and sell one vehicle nationwide
- Lower sulfur gasoline beyond Tier 2 levels
 - Both Tier 3 and LEV III vehicle standards depend upon lower sulfur gasoline
 - Sulfur at current levels degrades the performance of vehicle catalytic converters, the primary emission control system on vehicles
 - Tier 3 vehicle standards not achievable without lower sulfur
 - Lower sulfur also provides immediate emission reductions from the existing fleet
 - Catalytic converters on existing cars will perform more effectively



Tier 3 Vehicle Standards

- Phase in between 2017 and 2025
- Tighter VOC and NO_x tailpipe standards
 - 80% reduction from today's fleet average
 - Final fleet-average level of 30 mg/mile in MY 2025, compared with the current (Tier 2) level of 160 milligrams/mile (mg/mi)
- Tighter PM tailpipe standard
 - 70% reduction in per-vehicle standard from Tier 2
- Evaporative emissions standards
 - Reduced fuel vapor emissions and improved system durability
 - Harmonized with LEV_{III} zero evaporative standards – most stringent levels ever required
- Revised certification test fuel to be E10
 - Better reflects in-use gasoline
 - Current certification test fuel has no ethanol



Tier 3 Fuel Standards

- Fuels standards
 - Lower the annual average sulfur standard from 30 ppm under Tier 2 to 10 ppm
 - Starting January 1, 2017
 - Maintain the current per-gallon sulfur caps
 - 80 ppm at refinery gate, 95 ppm at retail



Fuel Flexibilities

- **Annual average** standard with a sufficiently high per-gallon cap
- **Flexible early credit program** and nationwide averaging, banking and trading provide up to 6 years of lead time
- **Relief for small refiners and refineries** <75,000 barrels per day
 - Three-year delay
- **Economic and technical hardship** provisions available to all refiners
- **Additional flexibilities:**
 - Carryover of “banked” credits from Tier 2
 - Longer deficit carryforward in the case of a hardship



Emission Impacts

Reductions in National On-Road Inventory

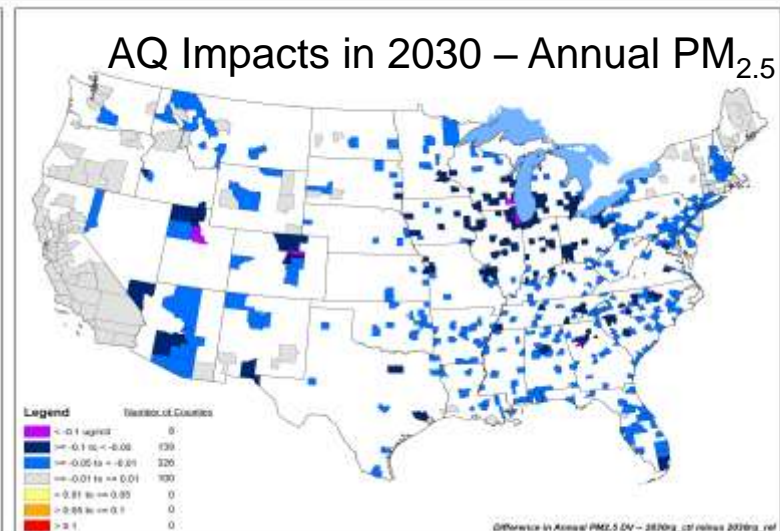
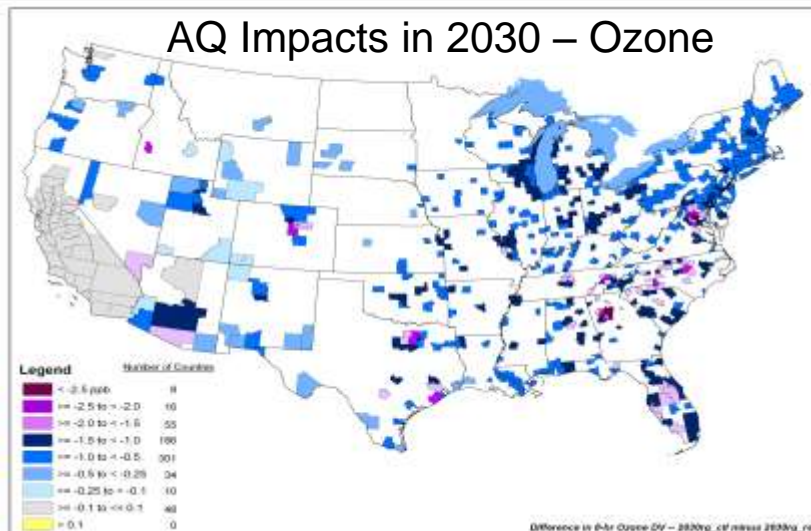
	2018		2030	
	Reduction (US Tons)	% Reduction	Reduction (US Tons)	% Reduction
NOx	260,000	10%	330,000	25%
VOC	48,000	3%	170,000	16%
PM2.5	100	0.1%	8,000	16%
Benzene	2,000	6%	5,000	26%

- Lower NOx, VOC, and PM2.5 emissions lead to
 - Moderate to large ozone decreases across the country
 - Small to moderate PM decreases across the country



Air Quality and Public Health Impacts

- Tier 3 standards will have immediate health and air quality benefits
 - Reduce ozone, particulate matter (PM), and toxics
 - Total Ozone and PM-related Premature Mortality Avoided: 770-2,000 in 2030
- Help States and local areas attain and maintain ozone and PM NAAQS
 - Tier 3 provides cost-effective national reductions that avoid more expensive local controls
- Reduce pollution near roads
 - More than 50 million people live, work, or go to school near major roads
- Total Monetized Benefits in 2030 (2011\$):\$6.7 to \$19 Billion





Compliance Schedules

- Declining fleet average for FTP (NMOG+NOx)
 - 2017 starting point 86 milligrams/mile
 - Tier 2 current requirement is 160 milligrams/mile equivalent
 - 2025 end point at 30 milligrams/mile
 - Same level as LEV programs PZEVs
 - Yearly linear decline in fleet average requirement until 2025
 - 5 year credit life and 3 year deficit
 - Average, banking and trading allowed
- New PM standards phase-in schedule
 - 2017 through 2021 with 20%/20%/40%/70%/100%
 - Alternative phase-in option for earlier compliance
- Test fuel and 150k useful life
 - Both are linked to vehicle specific bin level
 - New cleaner bins 70 and cleaner require new E10 and 150k
 - 2020 requires all certification bins use E10 and 150k useful life



APPENDIX



Summary of Costs and Benefits

- Fuel Sulfur Standard
 - 0.65 cents per gallon
- Vehicle Standards in 2025
 - \$72 per vehicle
- Annual Cost in 2030
 - Total Program: \$1.5 billion
 - Vehicle Program: \$0.76 billion
 - Fuel Program: \$0.70 billion
- Benefits outweigh costs by a factor of 4.5 to 13₁₁