
Nonroad Diesel Fuel Sulfur Control

MSTRS Nonroad Work Group

January 16, 2001

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Overview

- **What is nonroad?**
- **Nonroad engine standards and inventory**
- **Need to clarify EPA's nonroad program**
- **Timing of nonroad sulfur reductions**
- **Phase-ins**
- **Distribution issues**
- **Impacts on other distillate products**
- **Nonroad retrofits**
- **Summary**

What Is “Nonroad” Diesel?

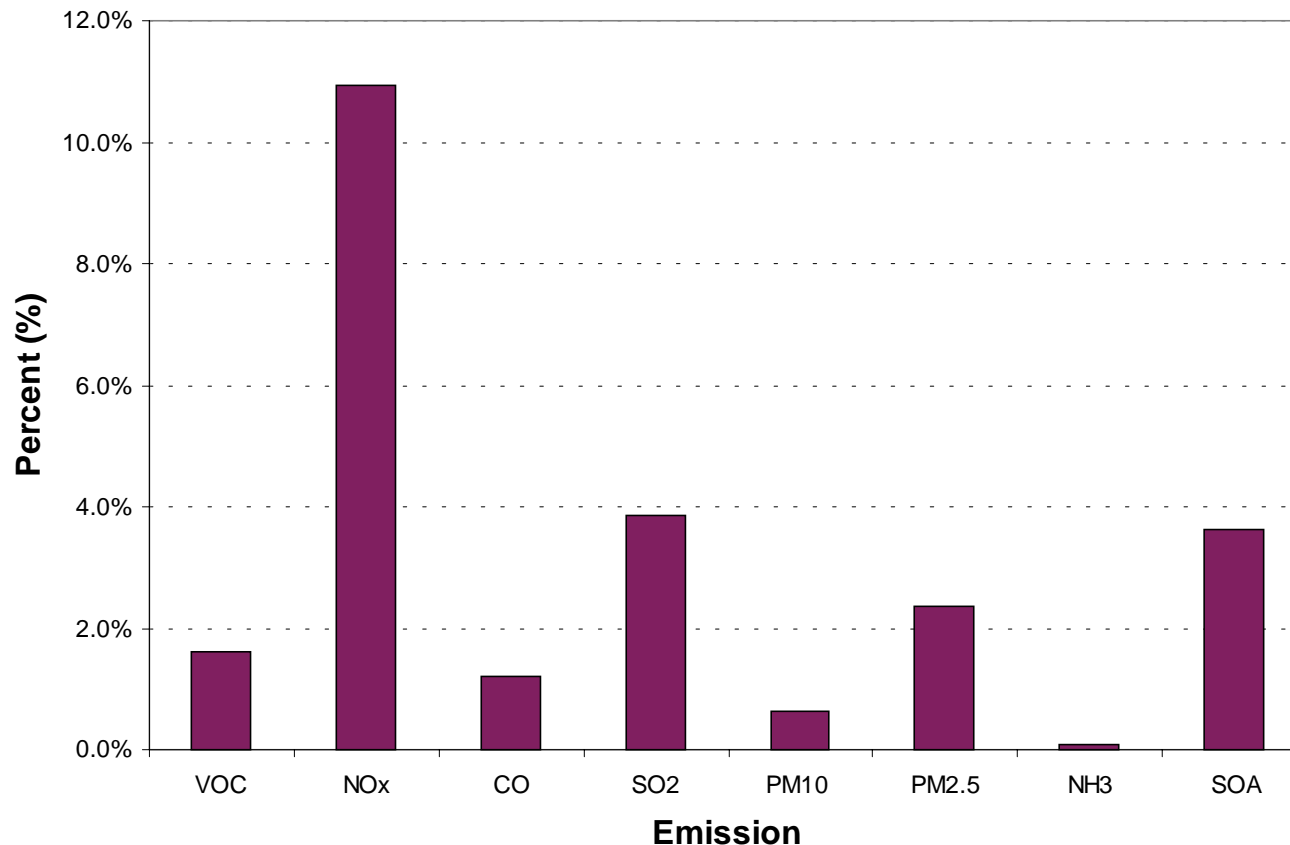
- EPA regulates several classes of nonroad diesel engines
 - Farm and Construction (Part 89)
 - Marine (Part 94)
 - Locomotive (Part 92)
- However, middle distillates are also used in other markets
 - Home Heating Oil – Industrial
 - Jet/Kerosene
- Not all distillate is diesel
 - ASTM defines diesel fuel oil (D-975-98b) and fuel oil (D-396-98)
- API anticipates EPA will seek to control nonroad diesel fuel used in Part 89 mobile source engines only
- The ultimate decision impacts volumes requiring treatment
- Regulating a portion of nonroad distillate will have impacts on the remaining portions



Emission Standards Should be Based on Demonstrated Need

- Emissions standards must be driven by demonstrated health and environmental need, must be technologically feasible, and should incorporate only the most cost-effective options
- Nonroad sources are a small portion of overall inventories (See charts)
- Direct sulfate emission reductions, the main in-use fleet benefit from fuel sulfur reductions, are not cost-effective
- EPA should propose and finalize Tier 3 PM standards and test cycles prior to exploring Tier 4 controls
 - EPA's recent MSAT rule indicates that more information is needed on nonroad diesel exhaust before additional regulations to control toxics can be established
 - EPA will conduct a multi-year analysis plan to gather this information - it will not be available by 2001
- PM aftertreatment has proven viable on various sulfur levels, but may not be viable on all nonroad engines

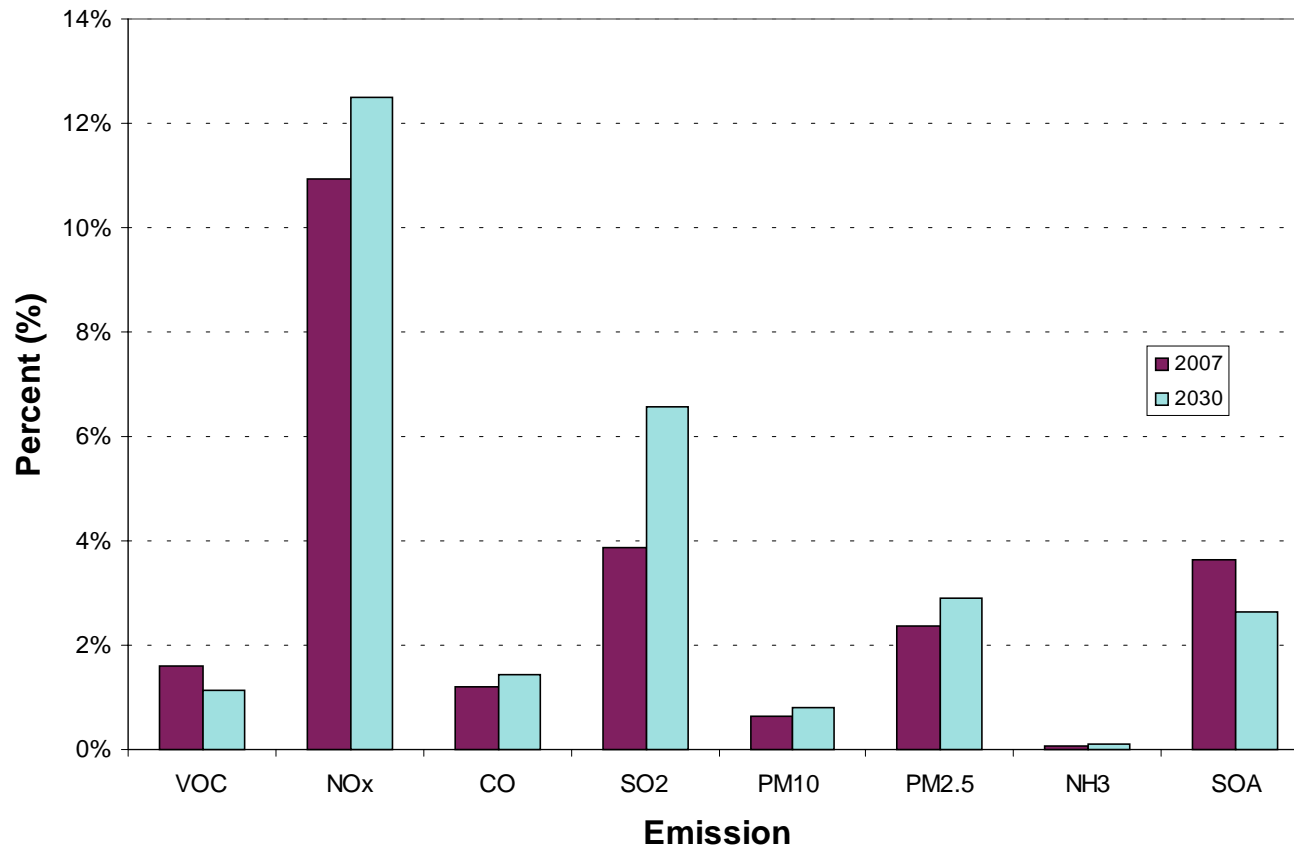
Non-Road Diesel Contribution to Total Nationwide Emissions Inventories in 2007



Source: EPA, "Procedures for Developing Base Year and Future Year Mass and Modeling Inventories for the Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Rulemaking," Tables VII-3 and VII-9, October, 2000.

- Nonroad diesel engines contribute only a small fraction to overall national inventories
- Significant portion of "Part 89" nonroad fuel is burned in rural attainment areas

Non-Road Diesel Contribution to Total Nationwide Emissions Inventories



Source: EPA, "Procedures for Developing Base Year and Future Year Mass and Modeling Inventories for the Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Rulemaking," Tables VII-3 and VII-9, October, 2000.

- Nonroad contributions grow only slightly by 2030 despite aggressive highway diesel and gasoline controls
- EPA must clearly show a public health need before further regulating nonroad engines or fuels

EPA Needs to Clarify the Nonroad Picture Promptly

- Most refiners cannot make highway and nonroad diesel investment decisions separately
 - Revamp versus new unit
 - Number of reactors, reactor size and pressure
 - Disposition of LCO
- Late investments and decisions could exacerbate engineering and construction (E&C) concerns and supply concerns
- Careful consideration must be given to infrastructure and distribution issues as well as domestic refining viability
- Aside from diesel sulfur, refiners are facing enormous costs and uncertainty over the next several years

What size reactor(s) will I need?

What nonroad fuels may be covered?

Will EPA find the existing nonroad standards feasible?



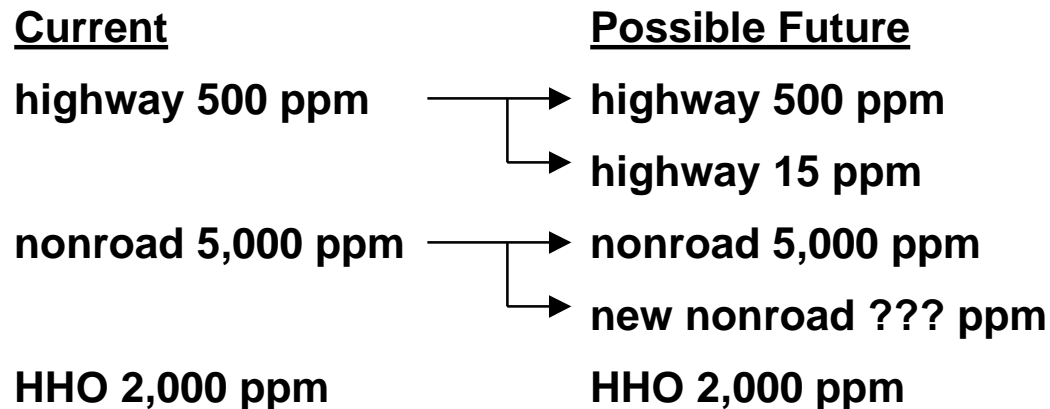
Will there be a Tier 4?

Nonroad Sulfur Reductions Prior to 2010 Will Be Problematic

- **The sulfur level and timing of EPA's recent highway rules make reductions in nonroad diesel sulfur this decade extremely problematic**
 - **The stringent 15 ppm highway sulfur level coincident with Tier 2 will require large amounts of capital and will severely tax the E&C industry - EPA's TCO and other options add to this concern by introducing distribution E&C needs**
- **Refineries choosing to invest in 15 ppm highway diesel in 2006 could face added investment costs right on top of Tier 2 and the 15 ppm highway rule**
 - **Invest in gasoline hydrocracking capacity instead?**
- **Refineries choosing to delay highway investment until 2008 - 2010 (through the TCO, GPA, or small refiner programs) are unlikely to be willing/able to invest in nonroad desulfurization before highway desulfurization due to required synergies**
 - **Additional investments during this time frame run directly counter to EPA's logic for adopting these programs and could exacerbate potential supply problems**
- **Refineries that only make nonroad distillate may not invest in sulfur reductions**
 - **40 refineries decided not to invest to produce 500 ppm sulfur highway diesel in 1993**
- **Timing of any fuel changes must not be driven by non-regulatory factors (e.g., Consent Decree pull-ahead requirements)**

Phase-In of Nonroad Fuel Sulfur Reductions Complicates Matters

- Phase-ins generally introduce a level of regulatory complexity and uncertainty, as well as adding more grades of fuel in the distribution system
- Depending on the level and timing of any nonroad sulfur reductions, the number of distillate grades in the distribution system could double in some regions



- A phase-in of nonroad sulfur reductions could “reward” the high sulfur producers in much the same way it could reward the late-investing highway producers

Fuel Distribution Impacts Must Be Recognized

- **Regulations must not disrupt efficient distribution of fuels**
- **Most pipelines/terminals handle highway diesel fuel (500 ppm) and up to two grades of nonroad diesel fuel (typically 2,000 ppm and/or 5,000 ppm)**
- **2007 highway rule combined with a nonroad rule could increase the system to 5 grades**
 - **New highway**
 - **Old highway (during phase-in)**
 - **New nonroad**
 - **Old 2,000 ppm nonroad**
 - **Old 5,000 ppm nonroad**



Other Distillates Could Be Impacted

- **Since pipelines/terminals normally support a total of two or three distillate grades, nonroad sulfur reductions could impact other fuels**
- **To reduce the number of grades in the system, refiners may have to lower sulfur in similar grades**
 - **Desulfurization costs would likely be shared by these similar fuels with little environmental benefit**
 - **Very low sulfur levels could have even greater cost impacts on these similar fuels**
- **The alternative would require significant added tankage at the refinery and in the distribution system for relatively low volume products**
- **Either scenario is likely to increase the cost of producing or delivering other distillate products**



Nonroad Engine Retrofits

- **In deciding whether to further regulate nonroad emissions and fuels, EPA should consider nonroad engine retrofits as an integral measure - not an add-on program**
- **Various sulfur levels have proven capable of enabling technology to significantly reduce PM from existing high-emitting engines**
- **Mandatory program or reconsideration of 3% voluntary measures limit on SIP credits**
- **Well-conceived retrofit program in conjunction with reasonable sulfur levels can achieve significant PM reductions while minimizing impacts on the distribution system, refinery viability, and the economy in general**

Summary

- **Emissions standards must be driven by demonstrated health and environmental need, must be technologically feasible, and should incorporate only the most cost-effective options**
- **EPA must clarify the future nonroad requirements as soon as possible**
- **The cost, stringency and timing of EPA's new highway diesel rule, in conjunction with other mandated fuel changes, makes implementation of nonroad fuel changes unlikely until the highway rule is fully implemented**
- **The likely benefits of nonroad fuel changes are too small to justify further jeopardizing the gasoline and diesel programs**
- **EPA must consider the impacts on the entire fuel system, from refinery to market**
- **Nonroad diesel sulfur control will likely impact other distillate products**
- **A nonroad retrofit program should be an integral part of the overall nonroad control scheme - not an add-on**
- **EPA should remain open to options that provide the greatest chance for successful implementation of its coordinated gasoline and diesel programs**
- **Reasonable standards that can be implemented will achieve greater results than unreasonable standards that cannot**