MSTRS Nonroad Work Group

STATUS REPORT

October 24, 2001

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Overview of Briefing

- Background
- Work Initiation
- Work Group Efforts
- Current Status?

Background

- WG chartered at October 2000 meeting of MSTRS.
- Purpose: To provide MSTRS with timely and well considered information, data, analyses, and recommendations on a range of topics related to emissions from nonroad sources and related factors such as fuels and usage.
- MSTRS would decide if and what to elevate to the full CAA Advisory Committee.
- The group initially focused on large land-based CI engine standards.
  - EPA's Tier3 technology review for large CI engines was coming due.
  - Large land-based CI engines are a big part of the NOx and PM inventories.

Group Membership

Over 30 stakeholders actively engaged in the process

- Engine mfrs
- Equipment mfrs
- Users
- Diesel fuel producers
- State gov’ts
- Env groups
- Public interest groups
- Trade associations
- DoE

Group Activity

- Group held kick-off meeting on January 16, 2001.
  - Group members provided their perspectives on large CI and nonroad diesel fuel issues.
  - 15 presentations providing various perspectives (on MSTRS website)
  - group discussed, compared and contrasted various positions
  - made preliminary decision to explore 4 key technical areas
    - » does sulfur in nonroad diesel fuel need to be limited to enable Tier 3 emission standards?
    - » what sulfur level is needed to enable NOx/PM aftertreatment for nonroad?
    - » what equipment types should be subject to a possible "Tier 4" program?
    - » what kind of retrofit program should be integrated into the Tier3/Tier4 programs?
- Agreed to Feb 10 follow-up conf call:
  - clarify Jan 12 perspectives and positions
  - identify action items and proposals for next steps

Key Issues

- **AIR QUALITY**:Is the need great enough to focus on the best available and cost-effective engine and fuels technologies for future nonroad engine and fuel standards, including a retrofit component, that results in holistically the most environmental improvement while minimizing potential supply disruptions?
- **TIER 3 TECHNOLOGY**: What technologies are available and what fuel sulfur levels are needed to meet potential Tier 3 particulate emission standards?
- **AFTERTREATMENT**: What fuel sulfur levels would enable application of advanced particulate and NOx aftertreatment technologies needed for the new nonroad diesel engine rules to meet potential Tier 4 emission standards? Are there equipment applications that for various reasons including significance, feasibility, costs, should be phased in over a longer period of time or not included in Tier 4?
- **RETROFITS**: What kind of retrofit program, including voluntary and mandatory approaches, should be integrated into the Tier3/Tier 4 programs with consideration given to the long phase in time for new equipment, desirability to remove the incentive to keep old equipment longer, and surplus ultralow sulfur fuel that may be available from the new onroad diesel program?

Messages

- Oil, engine, and equipment industries need input by end of 2001
- Integrate the phase-in of any new nonroad diesel fuels with the new onroad diesel fuel program. A reasonably structured market-based diesel fuel phase-in, not a near-term mandate, is a must.
- If aftertreatment standards are considered, they need to be implemented in onroad before nonroad.
- Harmonization of engine standards to the extent possible with other countries is important.
- For engine and equipment manufacturers lead time and stability of standards is needed to enable recovery of investment.
- Tier 3 emission reductions, including the anticipated change in the PM standard are important from an air quality and health perspective; cannot afford to forego Tier 3 emission reductions.
- If these or other options are considered, need to address misfueling and provide other assurances that reductions will occur including incentives to encourage purchase and use.

April Meeting

- Concern was once again expressed that time was running short for any new requirements for 2006, beyond current Tier 3.
- Interest emerged in exploring the idea of supplanting the Tier 3 requirements (which may require lower sulfur fuel) with a later "Tier 4" program requiring ultralow sulfur diesel and aftertreatment-based NOx/PM standards on a later schedule.
- Points of Discussion:
  - timing is critical for oil, equipment, and engine manufacturers
  - could get "aftertreatment-based standards sooner than otherwise
  - market-based fuel approach won't ensure fueling point availability
  - some possibility of cost savings from "skipping' Tier 3 technology and harmonizing potential diesel fuel sulfur requirements
  - need for Tier 3 level reductions in the near term remains critical

June Meeting - "Vision Statement"

The objective of the Nonroad Workgroup is to provide guidance to EPA on the means to implement further emission reductions from nonroad diesel engines and equipment (40 CFR Part 89) and improvements in nonroad diesel fuel quality to meet air quality needs. The Workgroup's vision for a longer-term future program includes the use of 15 ppm by weight sulfur diesel fuel to enable the use of on-highway like NO_x and PM aftertreatment technologies. To enable industry stakeholders such as engine manufacturers, emission control equipment manufacturers, equipment manufacturers, and petroleum refiners to make technology and investment decisions to meet the future standards as efficiently and cost effectively as possible, and to provide the certainty that states need to develop State Implementation Plans (SIPs), all stakeholders must know EPA's future intent for nonroad diesel engine rules by the end of 2001. The MSTRS Nonroad Workgroup will develop a consensus recommendation by Oct 15, 2001

Implementation Issues for Vision Statement

- SIP timing and air quality needs.
- The timing for implementing new engine standards, including the need to address engine and equipment manufacturers' lead-time and stability requirements.
- The timing and availability issues associated with, implementing new fuel specifications, and whether such specifications can be implemented on a market-driven basis.
- The need for assuring projected emission reduction goals are achieved.
- Initiatives to encourage emission reductions from current fleets and from the early introduction of cleaner fuels and low-emitting technologies.
- Provisions to avoid and discourage misfueling.
- Maximization of worldwide harmonization opportunities.
- The need for a systems approach to reducing emissions whereby fuel quality, emission control technologies, and standards are matched for each tier of emission standards.
- Developing the Workgroup's recommendations in a manner that avoids and discourages any requirement for an additional grade of federal diesel fuel and the need for boutique fuels.

July and August Meetings-Sub Groups

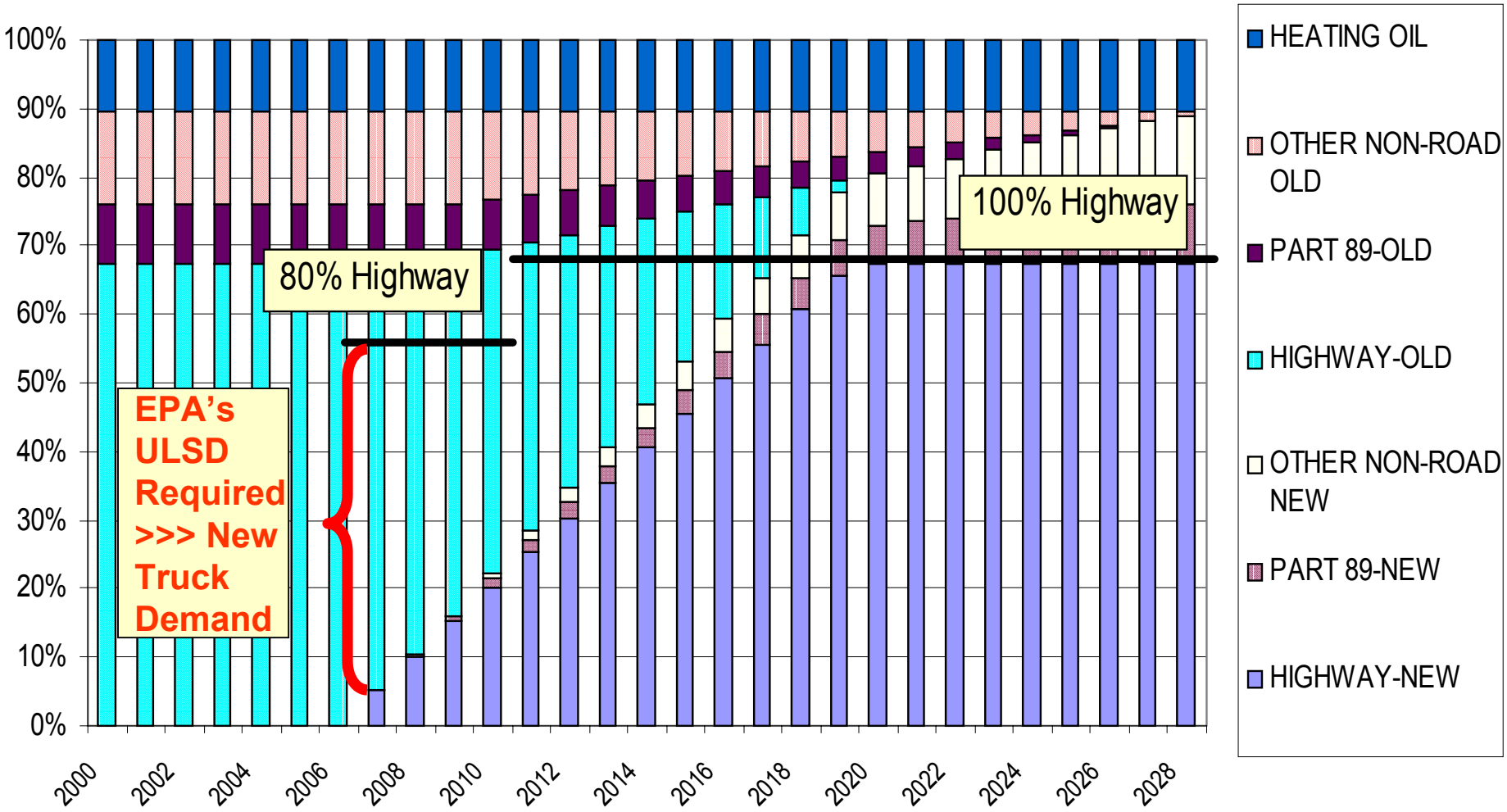
- Three Subgroups were established to develop concepts.
- Diesel Fuel
- Engines Standards and Timing (informal)
- Incentives/Assurances

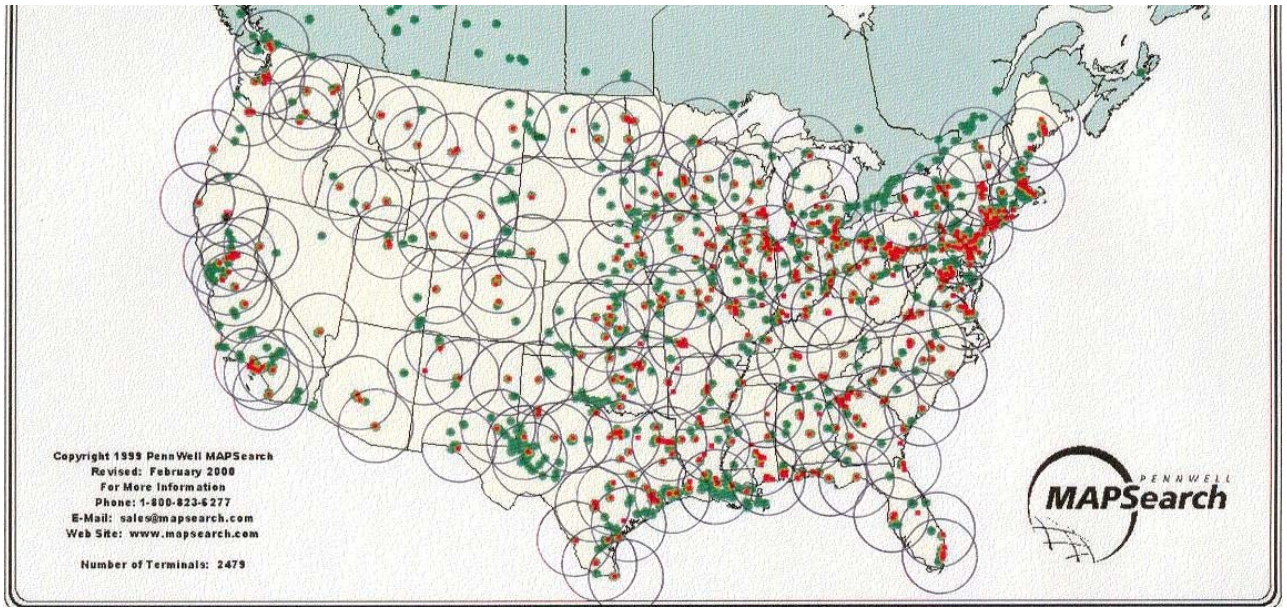
Diesel Fuel Subgroup

- Subgroup established to assess nonroad diesel fuel implementation issues.

- **NON-ROAD DIESEL DEMAND GRAPH:** EPA'S DIESEL RULE REQUIRES MUCH MORE DIESEL THAN THE NEW MODEL HIGHWAY TRUCKS NEEDING IT WILL DEMAND IN THE EARLY YEARS
- **U.S. TERMINAL MAP:** THERE APPEARS TO BE SUFFICIENT COVERAGE OF LOW SULFUR DIESEL AT TERMINALS THROUGHOUT THE U.S. TO MAKE A MARKET BASED APPROACH WORK.
  - PENWELL MAPSEARCH HAS IDENTIFIED 2479 LIQUID TERMINALS THROUGHOUT THE U.S. -- NOT ALL ARE PETROLEUM TERMINALS.
  - THE PETROLEUM TERMINALS THAT CARRY LOW SULFUR DIESEL FUEL ARE INDICATED WITH A RED DOT ON THE MAP.
  - CIRCLES REPRESENTING TYPICAL 200 MILE DIAMETER GEOGRAPHICAL COVERAGE HAVE BEEN OVERLAID ON EACH TERMINAL CARRYING LOW SULFUR DIESEL.
- **DIESEL Q/A DOCUMENT**

COMPOSITION OF DIESEL POOL-MARKET DEMAND FOR NON-ROAD

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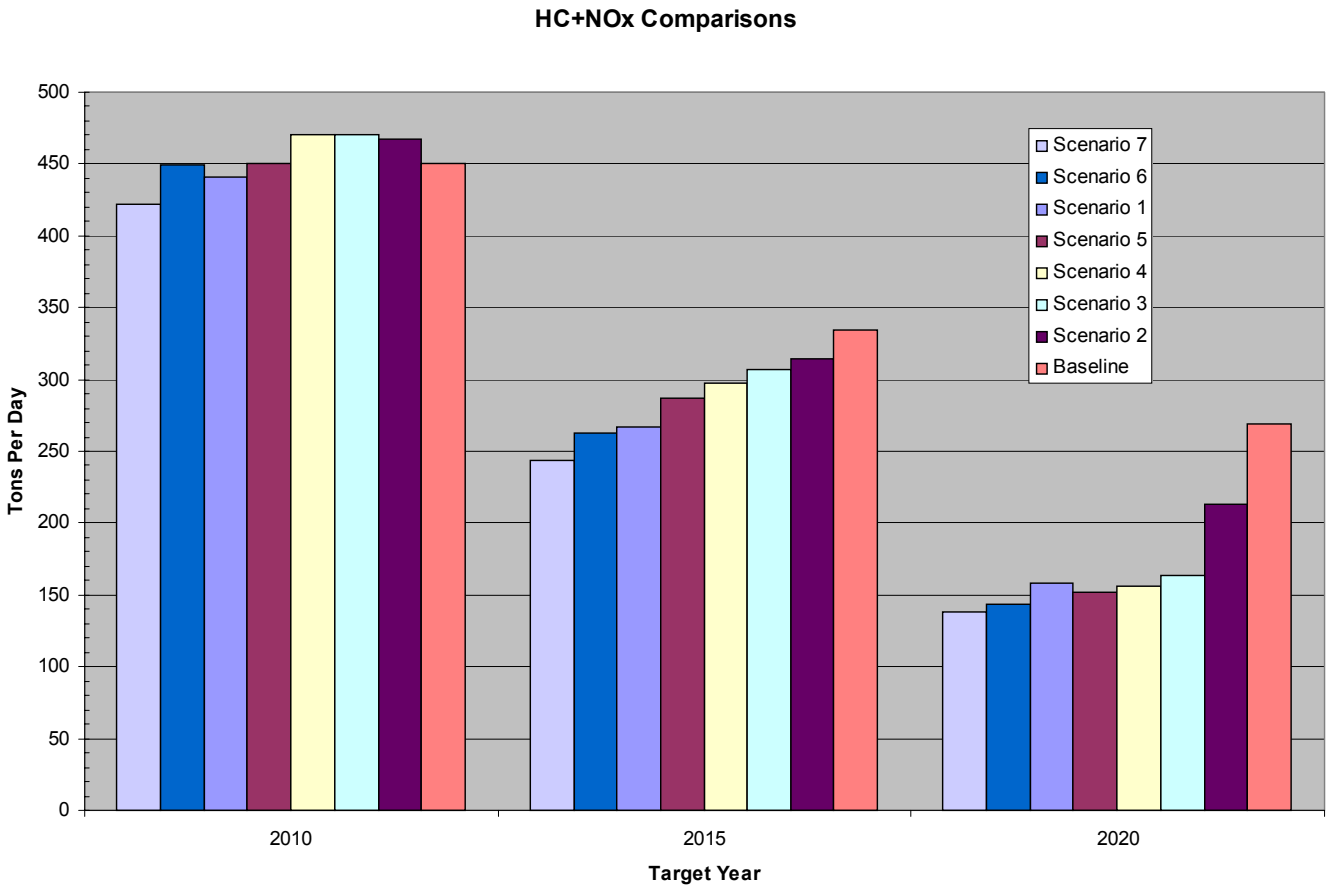
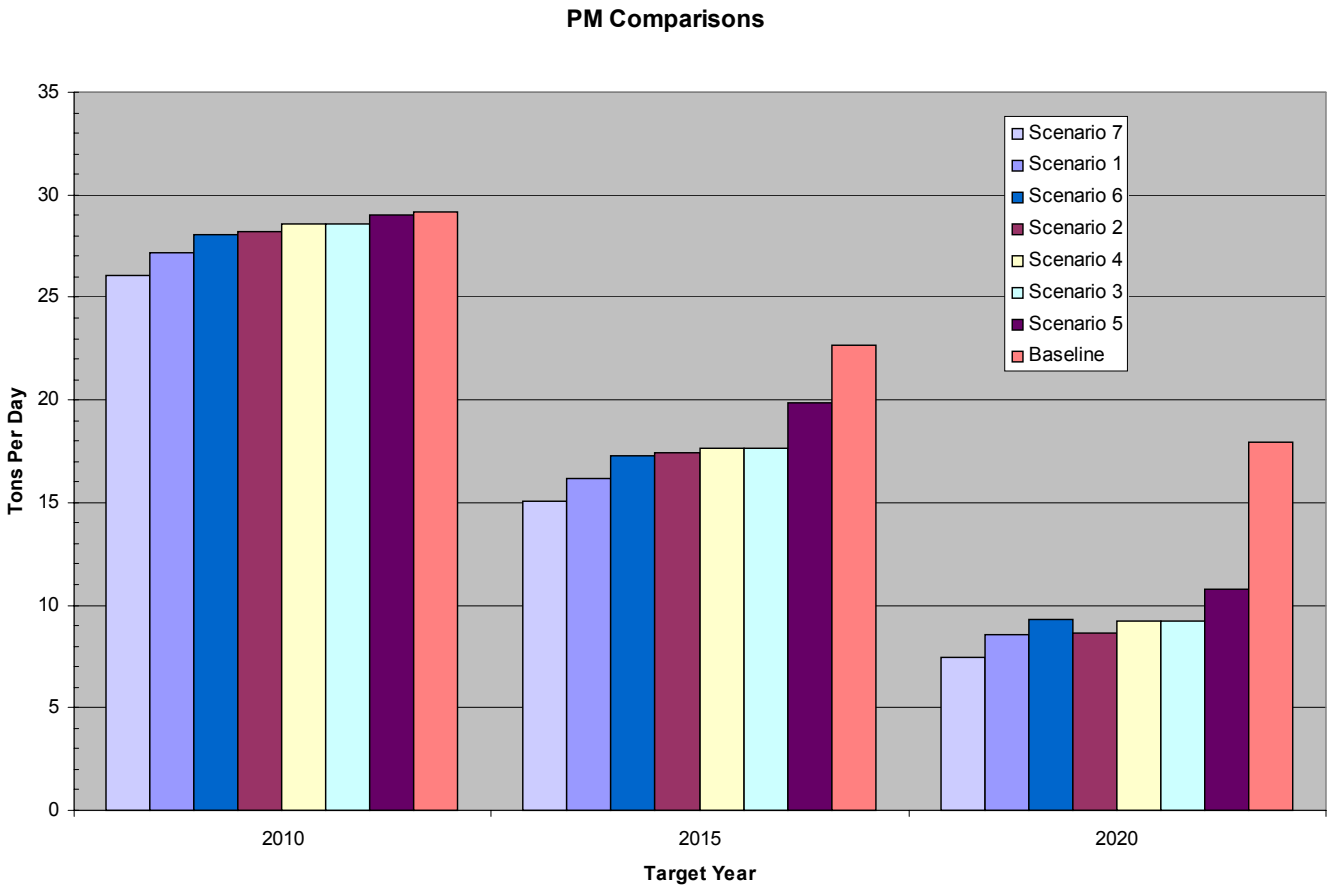
Engine Standards and Timing

- Informal subgroup established to assess inventory implication of various scenarios. No intended leaning or endorsement of any scenario per se. Primarily an initial bounding exercise for comment; some wanted more aggressive implementation.
- Scenario Descriptions:
  - Baseline: Current Tier 2 and Tier 3
  - Scenario 1: Tier2, Tier 3, plus 50-90% PM and 0-80% NOx 2007-2011
  - Scenario 2: Tier 2 plus 40% NOx and PM aftertreatment stds 2008-2013
  - Scenario 3: Scenario 2 plus NOx aftertreatment stds 2012-2016
  - Scenario 4: Scenario 3 with earlier conclusion of aftertreatment standard phase-in
  - Scenario 5: Tier 2, Tier 3, & aftertreatment NOx and PM stds 2012-2014
  - Scenario 6: Tier 2 & aftertreatment NOx (2009-13) and PM (2009-12)stds
  - Scenario 7: Tier 2 ,Tier 3, plus NOx/PM aftertreatment stds 2007-2010

HC+NOx Comparisons



PM Comparisons



Incentives/Assurances

- Subgroup formed to explore means by which emission reductions can be achieved during program introduction and phase-in. Involves both equipment and fuel use.

- Objectives:
  - assure air quality benefits achieved when expected
  - make the purchase of cleaner new equipment more attractive
  - encourage the availability and use of required diesel fuel
  - create offsets and achieve early emission reductions

Concepts Identified

- Indy/Gov't voluntary retrofit
- Federal fleet requirement
- State city equipment reqmt
- Fleet average or cap reqmt
- Voluntary blue sky program
- Contract bidding points for clean and retrofit equipment
- Clean equipment as contract spec.
- State/city tax credits or registration rebates for clean equipment
- New clean equipment tax rebate
- Tax relief for low sulfur diesel users early in the program
- Differential tax for high vs. low sulfur diesel
- Accelerated depreciation for new clean equipment
- Funds to partially or fully subsidize costs of replacing, repowering, rebuilding, retrofitting
- Use clean engine emission reductions env. mitigation
- Marketable emission credits for clean, rebuild repower, retrofit

Current Status

- Group's original plan was to provide input to MSTRS at this meeting.
- In early August it became evident that EPA would release a White Paper on nonroad this fall. To maximize the value of our efforts, the MSTRS co-chairs suggested that we summarize our work to date and provide it as input into that process.
- Given this development, we are seeking guidance from the MSTRS on our next steps.
- The report to EPA and other key documents will be made available through the MSTRS web page pending your approval.