

# SUSTAINABILITY AND PROACTIVE PRODUCT STEWARDSHIP AT NAVISTAR

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## Abstract

**Introduction:** The proactive product stewardship program at Navistar Inc. is making progress in three major areas of sustainability: environmental, social, and economic. To address these three areas, the company has focused on reducing the environmental impacts of its operations and products, while at the same time promoting local community goals, creating favorable workplace environments, and providing economic rewards for reducing greenhouse gases.

**Methods:** This paper reviews the product stewardship program at Navistar. Quantitative and qualitative analyses of the program's progress are presented.

**Results:** Environmental sustainability efforts have met or exceeded the regulatory mandate on emissions of air pollutants from society, including heavy-duty diesel engines using a combination of innovative product designs and proactive implementation of emissions reduction technologies. In addition, Navistar has continued to investigate the human health implications of exposure to diesel exhaust, a complex mixture that changes considerably with technology advances. To be socially sustainable, Navistar has programs that are beneficial to the health and welfare of both employees and communities in areas where Navistar has facilities. In addition, the company is more economically sustainable by increasing energy efficiency at its manufacturing facilities and of its products, thereby saving money for both the company and the customers.

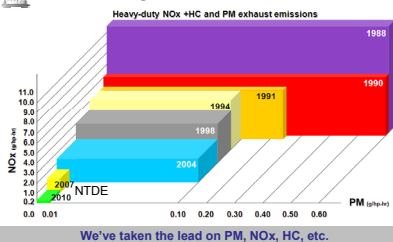
**Discussion:** Factoring environmental, health, safety, security, and local community goals into business decisions benefits both society at large as well as the company. Establishing a reputation for socially responsible business practices creates goodwill among key stakeholder groups, and makes the company more attractive to high quality employees. Socially responsible investors may be more attracted to the company, and a sustainability strategy may also provide a competitive advantage for product marketing over other companies, to the extent that customers care about the environmental and social records of companies.

## Our Three Pillar Strategy Contributes to Navistar's Sustainability

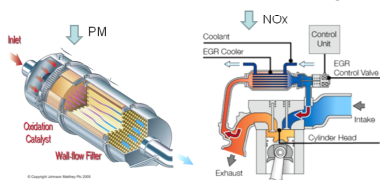
Leveraging What We Have and What Others Have Built



## Navistar Has Taken the Lead in Reaching Near-Zero Emissions



## New Technology Diesel Exhaust (NTDE) Treatment Systems - Particle removal and NOx Elimination Using EGR



## Summary of NTDE Studies

- PM levels in NTDE are 100-fold lower than in TDE
- NTDE PM is chemically very different from TDE
  - Chemically similar to CNG and gasoline PM
- NTDE emissions generally lower than CNG or gasoline
- Biological effects of TDE were not observed with NTDE

Reviewed in: Hesterberg et al. 2011 *Journal of the Air & Waste Management Association*, 61(9):894-913.



## We Lead in Hybrid and All-Electric

- First to produce hybrid school buses
- First to produce hybrid commercial trucks
- Leaders in plug-in hybrid school buses
- First in the U.S. to deliver all-electric community vehicles



## Diesel Engine Manufacturers Use SCR-Urea or Exhaust Gas Recirculation (EGR) to Meet EPA's 2010 NOx Standards

- Most truck manufacturers are using SCR-Urea
- Navistar is using in-cylinder advanced exhaust gas recirculation (EGR)
- Most truck manufacturers will add on separate urea tanks to use SCR-Urea
- SCR-Urea technology has numerous potential health, safety and environmental issues
- SCR-Urea systems can be easily circumvented which results in no reduction and perhaps a potential increase in NOx emissions
- SCR-Urea is temperature dependent
- SCR-Urea requires a separate tank filled by driver



## PROStar + Leadership on Aerodynamics

- Making the most aerodynamic heavy trucks on the market
- Working with NASA and Lawrence Livermore National Laboratory
- Reducing trucks' aerodynamic drag
- Saving energy
- Cutting greenhouse gas emissions



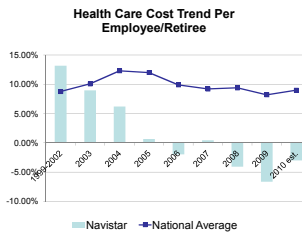
Up to 4.5% Fuel Economy Improvement vs. 2009 ProStar®



## Health Care Cost Containment

### Continued Improvements

- Cost trends much lower than national average
- Continued improvements
- Down 6.6% per capita
- Down 9.9% overall



## Reduced Costs from Improved Safety

### Continued Improvements

- 28% improvement in lost-time case rate (LTCR)
- 28% in incident frequency rate (IFR)



## Reduced Disability Costs, Absenteeism

### Continued Improvements

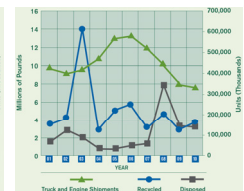
- Combined workers compensation and disability costs are 23% improved over the 3-year baseline
- Workers comp costs 21% better than baseline
- Disability costs 30% better than baseline
- Reduced controllable absenteeism



## Reduced Waste

### Non-Hazardous Waste Generation

### Hazardous Waste Generation



## Reduced Energy Use

### Improvements through June

- Energy costs down 19%
- 10-hour shifts cut emissions/unit by 16%
- 2013 Goals
- Reduce electric load 1% annually during production periods
- Non-production load at 35% of production load
- Proposed 20% GHG reduction



## Sustainable Design of Navistar's New World Headquarters



- Consolidating Navistar groups onto one site
- Renovating Alcatel-Lucent campus in Lisle
- Going from current WHQ of 250,000 to 2 million sq ft
- Working with Wildlife Habitat Council

## Advancing Sustainability at Navistar —The Road Ahead—

- Use sound science to assess the health, safety and environmental impacts of different technologies
- Develop low-emitting vehicles and engines
  - Near-zero emissions of NOx, PM, HCs, etc.
  - Decreased CO<sub>2</sub> emissions from hybrids, electric, etc.
- Reduce healthcare costs and improved employee safety over the last ten years
- Reduce energy use and thus GHG release at facilities
- Become even more economically sustainable through our expertise in emissions reduction technology