Navistar Truck Group
Green Initiatives

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Topics

- The Demand for Oil
- Green House Gas

Solutions Delivered
- Emissions
- Fuel Economy
- Hybrids

Future
- Emissions and Fuel Economy
- Partnerships to make it happen
**Big Drivers for Change**

- **World oil**
- **Greenhouse Gas (GHG) standards**

*We’re not in danger of running out of oil soon. What matters is …*

*When does the GAP between demand for oil and production capacity occur?*

Source: Advanced Technology Division; Office of Transportation and Air Quality; U.S. Environmental Protection Agency
China wants half its population to be “middle class” by 2020

Wall Street Journal
2007 US Greenhouse Gas Inventory by Sector

- Commercial and Industrial: 46%
- Transportation: 33%
- Homes: 21%
- Automobiles and Trucks: 26%
- Other: 7%

Source: EIA, Annual Energy Outlook 2007
1 Gallon of Diesel Consumed = 22 Pounds of Carbon Dioxide Produced

A 10% Fuel Efficiency IMPROVEMENT in all NA HD tractors would deliver:

178,250,000 fewer gallons consumed
1,971,000 fewer tons of CO₂ produced
Solutions Already Delivered

MaxxPower APU
Saves 1,800 gals of fuel
& 20 tons of CO2

DuraStar Hybrid
Saves 1,500 gals of fuel
& 16 tons of CO2

ProStar Aerodynamics
Saves 1,600 gals of fuel
& 17 tons of CO2

Plug in HEV IC School Bus
Saves 700 gals of fuel & 6 tons of CO2

RouteMax
Saves 1,350 gals of fuel
& 15 tons of CO2

Note: Savings are per vehicle per year.
Solutions Already Delivered:
Hybrid Electric Vehicle Facts

Fuel Saved Annually

- $552 *1
- 138 Gallons
- 12,500 Miles

- ~ 600-900 Gallons Saved
- 20,000 Miles
- $2,400 to $3,600 *2

- ~ 1,000-1,500 Gallons Saved
- 12,000 Miles
- 3 Hrs / Day Work-site Ops
- $4,000 to $6,000 *2,3

- ~ 1,200-1,900 Gallons Saved
- 9,500 Miles
- 6 Hrs / Day Work-site Ops
- $4,800 to $7,600 *2,3

- ~ 2,800-3,500 Gallons Saved
- 120,000 Miles
- 9 Hrs / Day Overnight “Hotel Load”
- $11,200 to $14,000 *2,4

Emissions Reduced**

- HC: 70%
- CO: 60%
- NOx: 40%

** Over the road & Worksite Ops

** Based on independent 3rd party testing

Note: Compared to non-HEV.

*1 Assume 21mpg; 30% improvement
*2 $4.00/gallon fuel
*3 Assume baseline: 7.5 MPG & 1.18 GPH idle
*4 Assume baseline: 6.5 MPG & 1.0 GPH idle
Future Technologies

Tractor Trailer
Up to 16% fuel economy improvement demonstrated in SAE Type II testing

Waste Energy Recovery
Recover some of the diesel fuel energy (~60%) that is lost to coolant and exhaust

Vehicle Electrification
Deliver fuel economy through electrifying the power train

Engine Application and Fuel Mapping

Cooling System / Air Management Optimization

Optimization … Combustion / Air Flow / Heat Exchangers

5-10% Electrical Components
10-15% Engine-Off at Idle
15-20% Engine Downsizing
25-35% Base Hybridization
Partnerships to make it happen

Industry
- Suppliers
- Major Components
- Vehicle OEMs
- Dealers
- Fleets
- Customers

Government
- DOT / DOE / DOD / EPA
- 21st Century Truck Partnership
- National Labs
- CARB
- HTUF

Universities
- Centers of Excellence
- Specific technology development
- Consortiums
- Partnerships
Thank You