



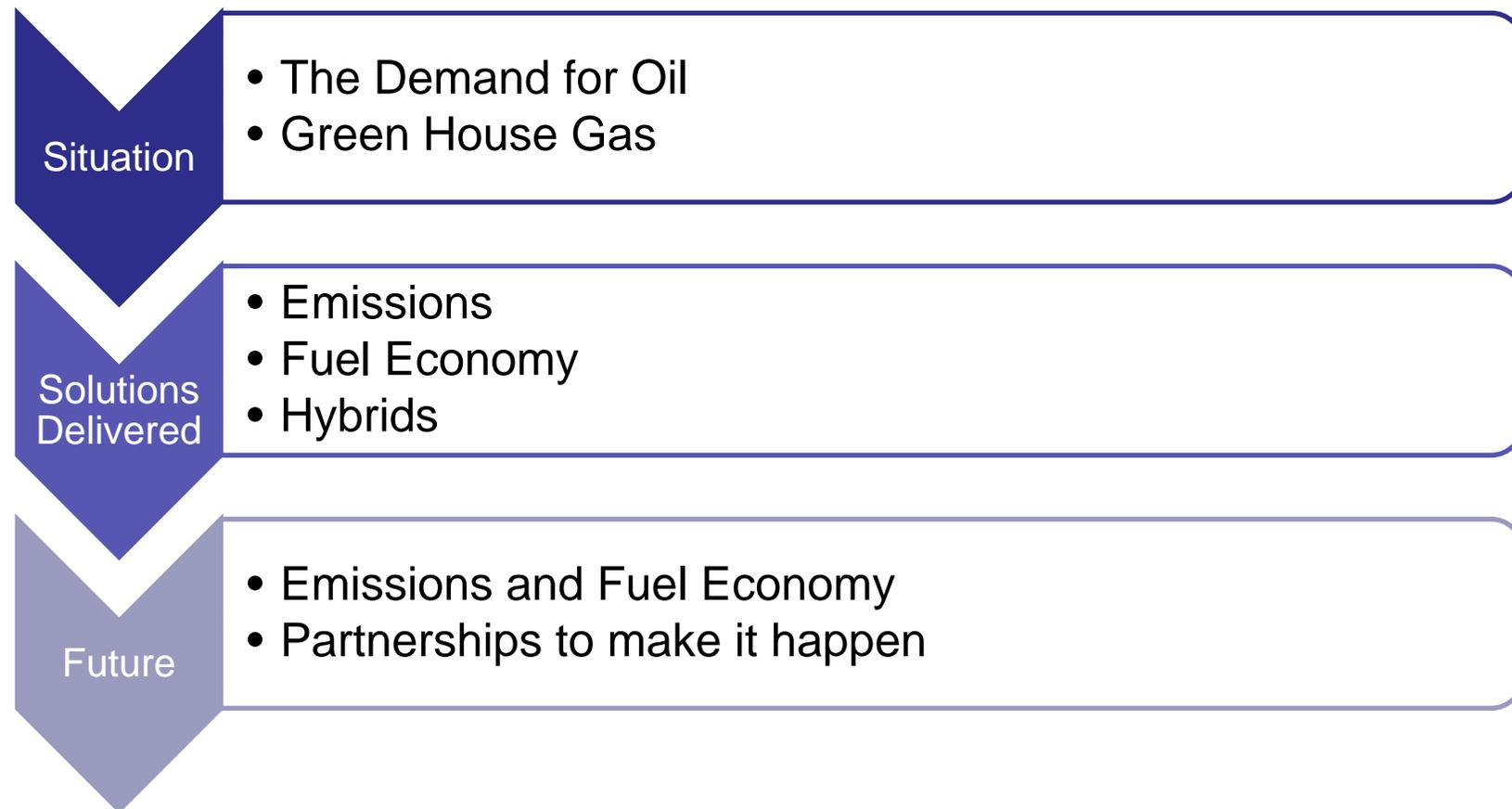
## Navistar Truck Group Green Initiatives

*Steve Bruford*  
*Vice President, Global Product Creation*

*October 2008*



# Topics

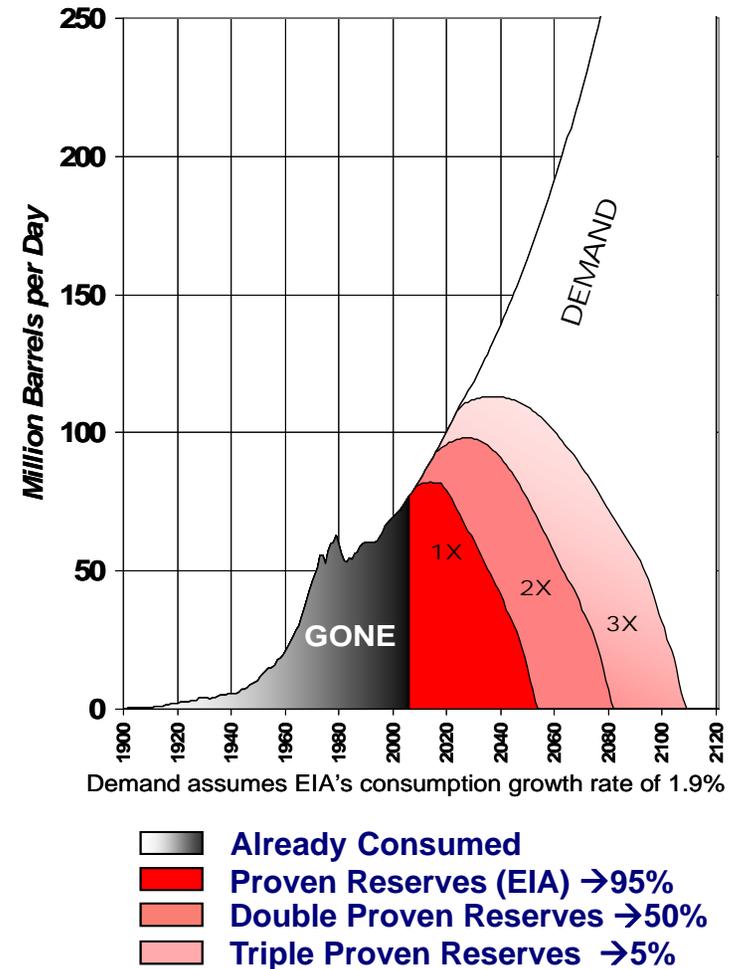


## Big Drivers for Change

- ⇒ 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

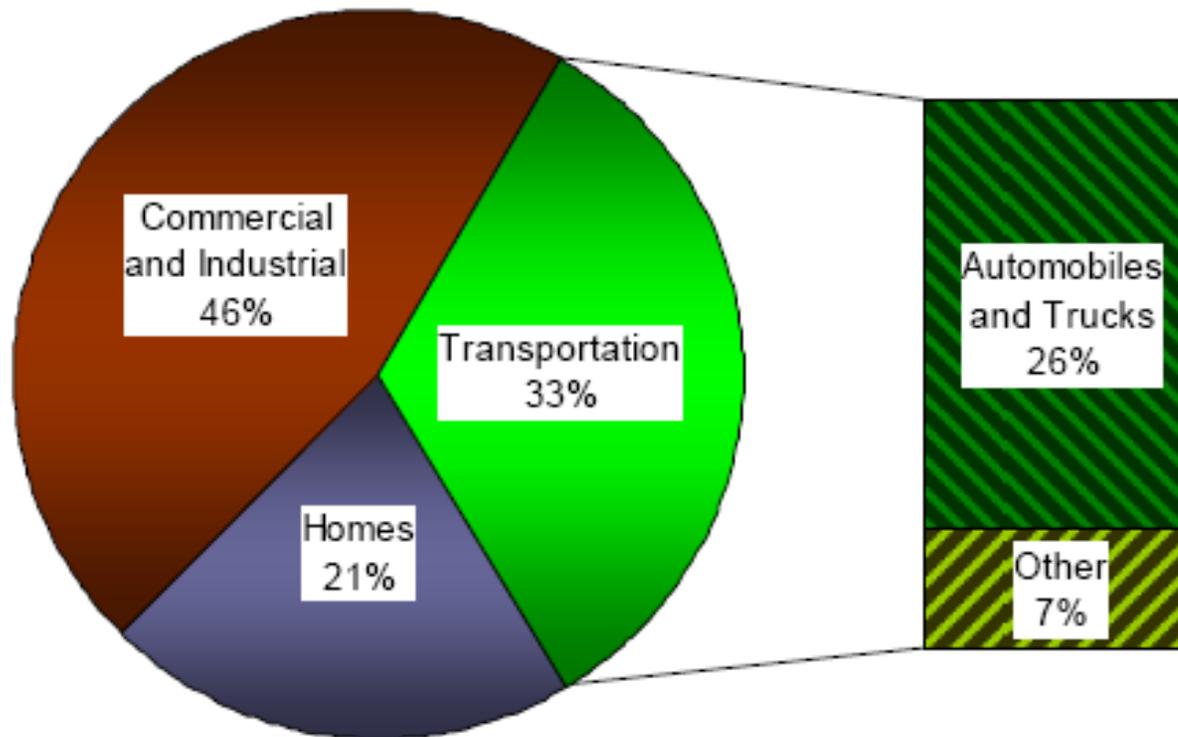
*Wall Street Journal*

**Cars in India/China  
2004**

**Cars in India/China  
2050**



## 2007 US Greenhouse Gas Inventory by Sector



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



## DuraStar Hybrid

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



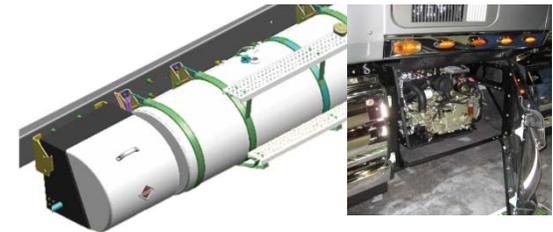
## ProStar Aerodynamics

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



## MaxxPower APU

Saves 1,800 gals of fuel  
& 20 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

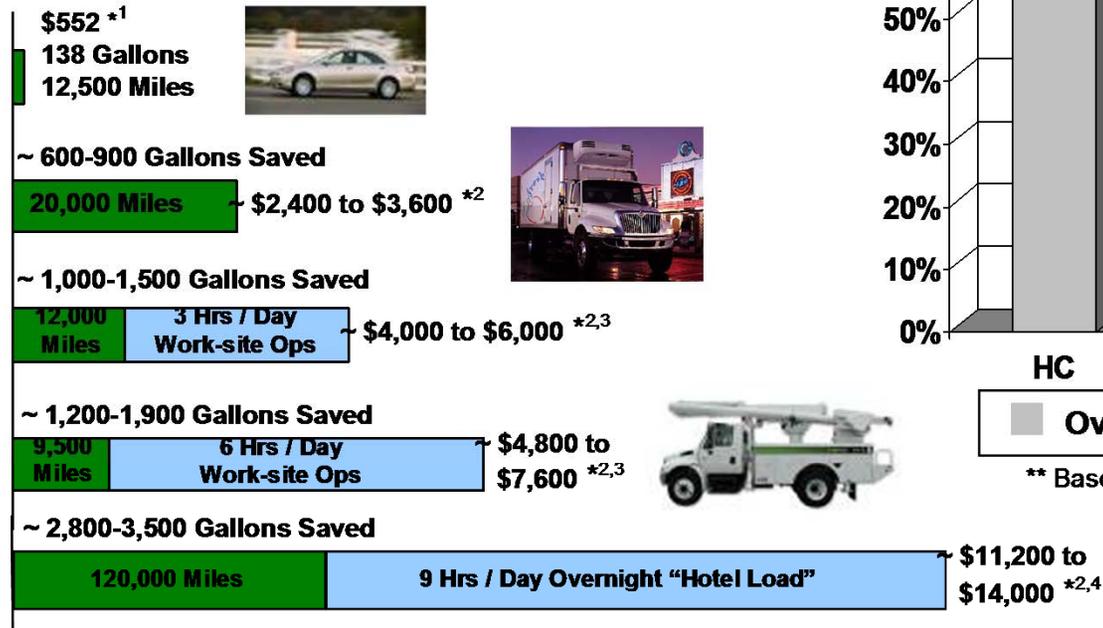


Note: Savings are per vehicle per year.



# Solutions Already Delivered: Hybrid Electric Vehicle Facts

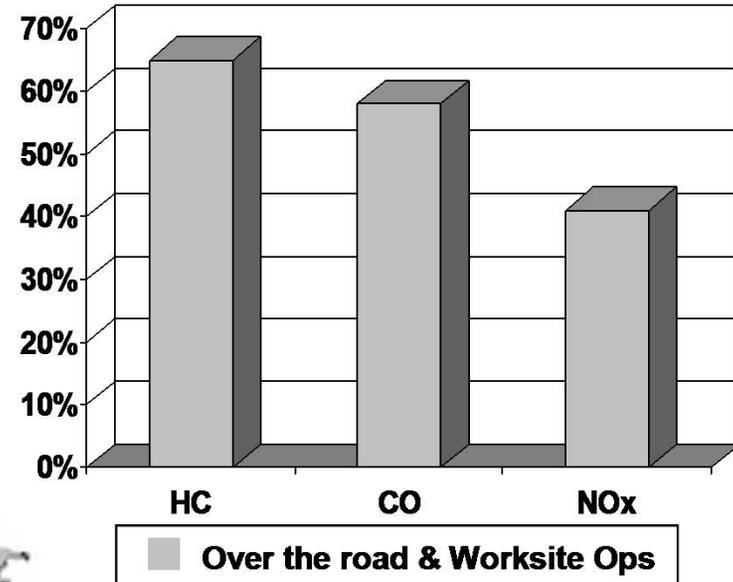
## Fuel Saved Annually



■ Over the Road  
■ Engine off work-site

- \*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

## Emissions Reduced\*\*



\*\* Based on independent 3<sup>rd</sup> party testing



Note: Compared to non-HEV.

## 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

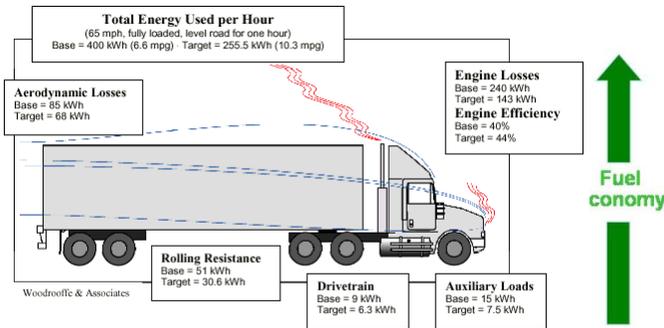


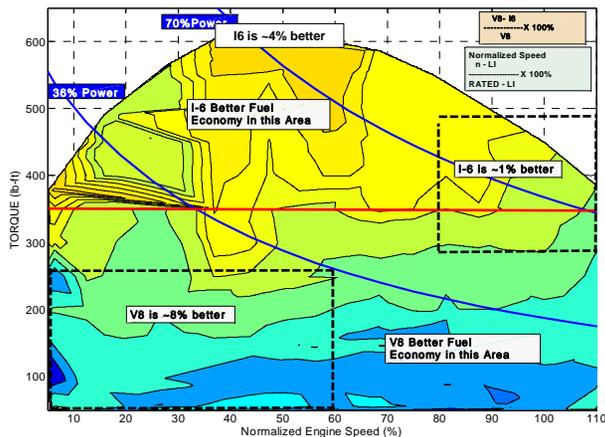
Fig. 4.1. Class 8 truck energy audit.

## Vehicle Electrification

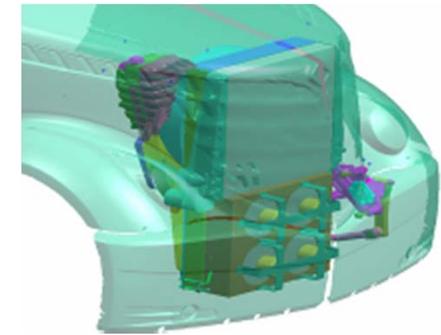
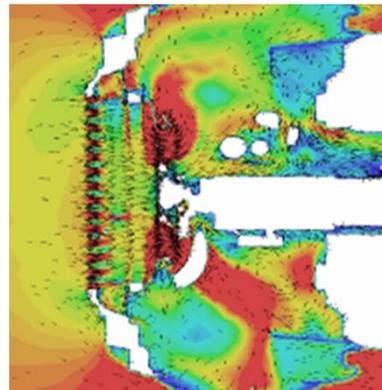
Deliver fuel economy through electrifying the power train



## Engine Application and Fuel Mapping



## Cooling System / Air Management Optimization



## Optimization ... Combustion / Air Flow / Heat Exchangers

# Partnerships to make it happen



Industry

Suppliers  
Major Components  
Vehicle OEMs  
Dealers  
Fleets  
Customers



Government

DOT / DOE /  
DOD / EPA  
21<sup>st</sup> Century  
Truck Partnership  
National Labs  
CARB  
HTUF



Universities

Centers of  
Excellence  
Specific  
technology  
development  
Consortiums  
Partnerships



Thank You

