

Major Economies Meeting on Energy Security and Climate Change

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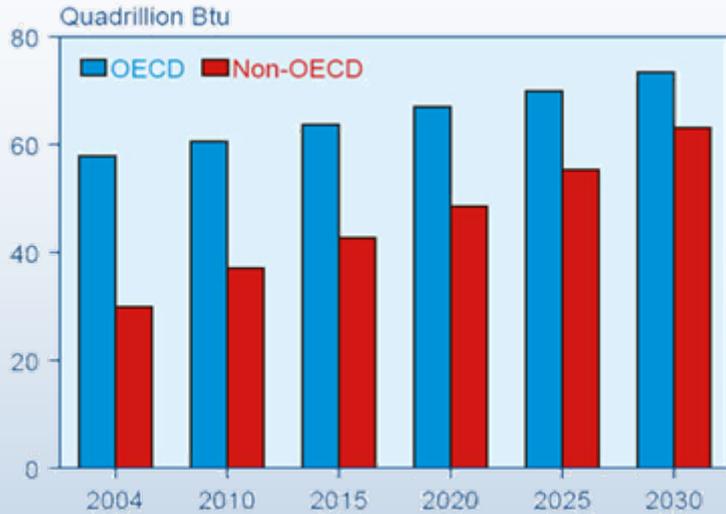
Transportation: Vehicle and Fuel Technology

- Scale of the issue
- Sector status
- Technology opportunities
- Key challenges

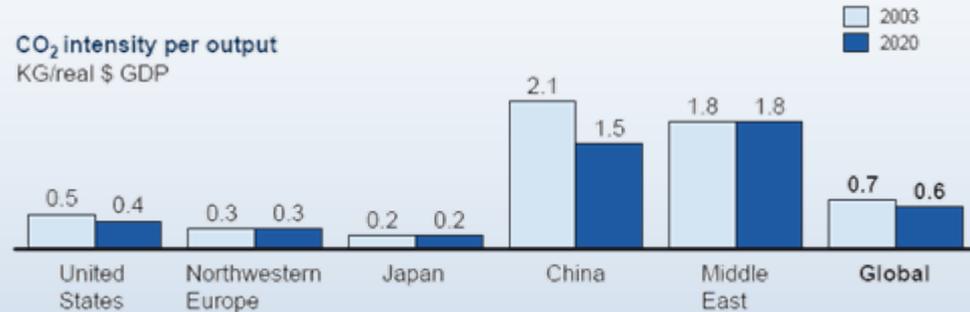


Setting the Context

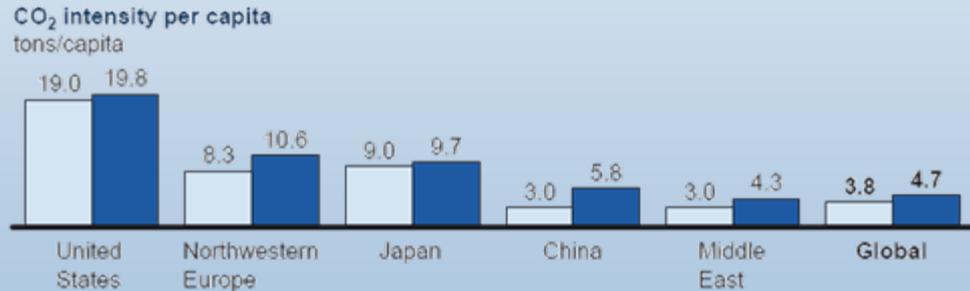
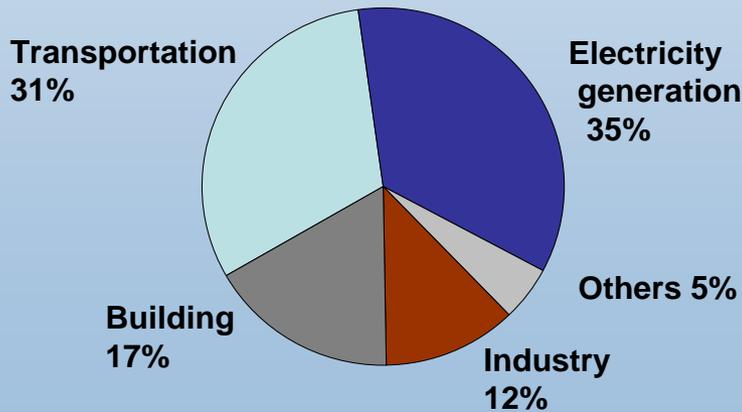
**Transportation Sector
Energy Consumption 2004-2030**



**CO₂ Intensity
per Output and per Capita**

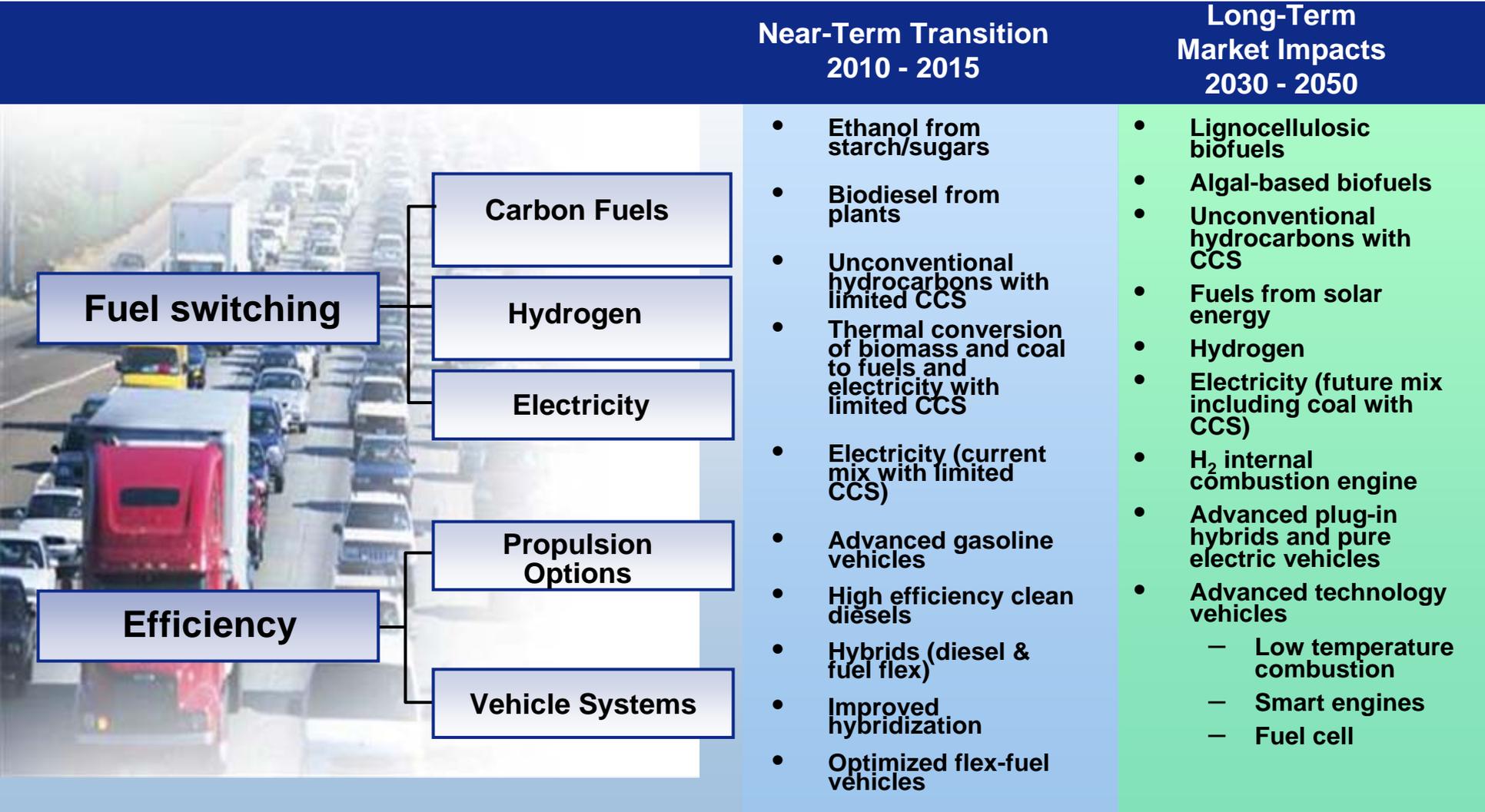


**2003 North America CO₂ Inventory
Total 6805 Mt CO₂**



Sources: 1) 2004: Derived from EIA, International Energy Annual 2004 (May-July 2006). Projections: EIA, System for the Analysis of Global Energy Markets (2007) 2) Honda Motor Company, *GHG Emissions Reduction From Mobile Sources* (Sept 19, 2007) 3, 4) McKinsey Global Institute, *Curbing Global Energy Demand Growth: The Energy Productivity Opportunity* (May 2007)

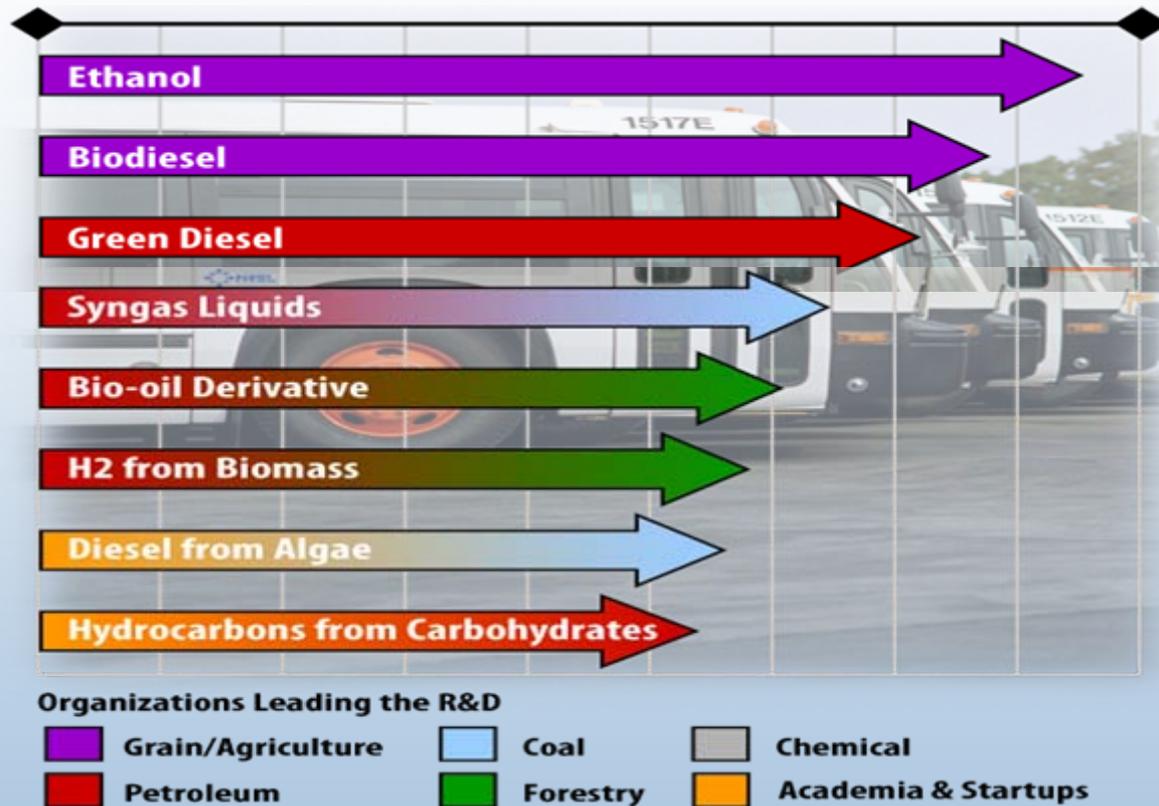
Options for Reducing Carbon Emissions in Transportation



....different technical and market risks

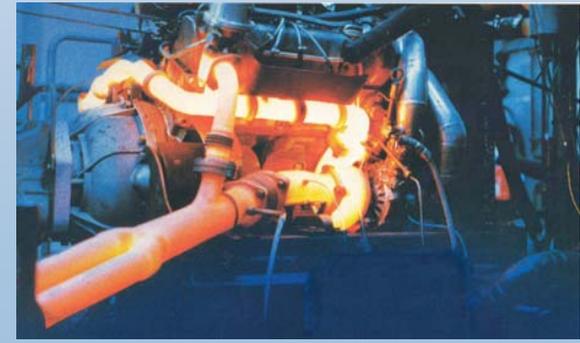
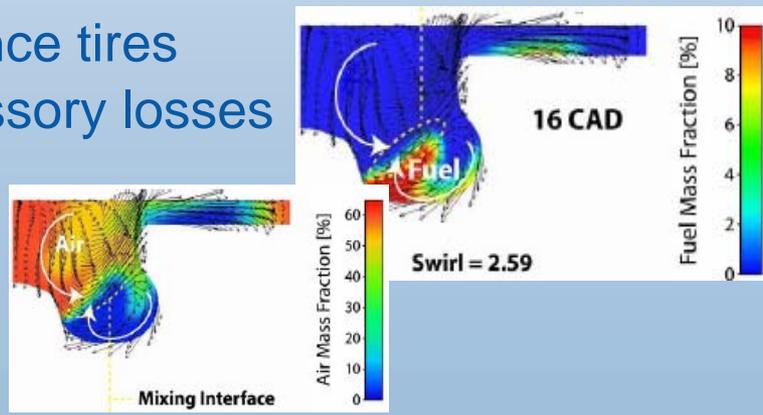
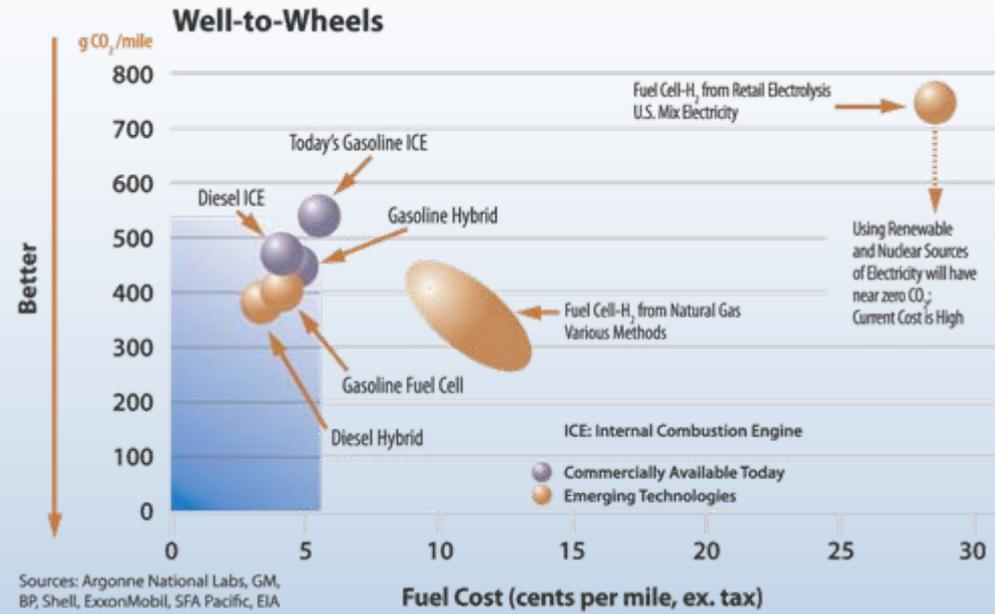
Transportation Fuels

- Advanced fossil fuels
 - Carbon neutral
- Biofuels
 - Next gen biofuels
 - Sustainability
- Hydrogen
 - Production
 - Storage
 - Use
- Electricity
 - Fossil (CCS)
 - Nuclear
 - Renewables



Vehicles

- Engine technology
- Transmission efficiency
- Power electronics
- Advanced motors
- Battery storage
- Reduced losses
 - Lightweight materials
 - Low draft coefficient
 - Low resistance tires
 - Lower accessory losses



Infrastructure



Reducing Carbon in the Transportation Sector

Technologies

Reducing Risk

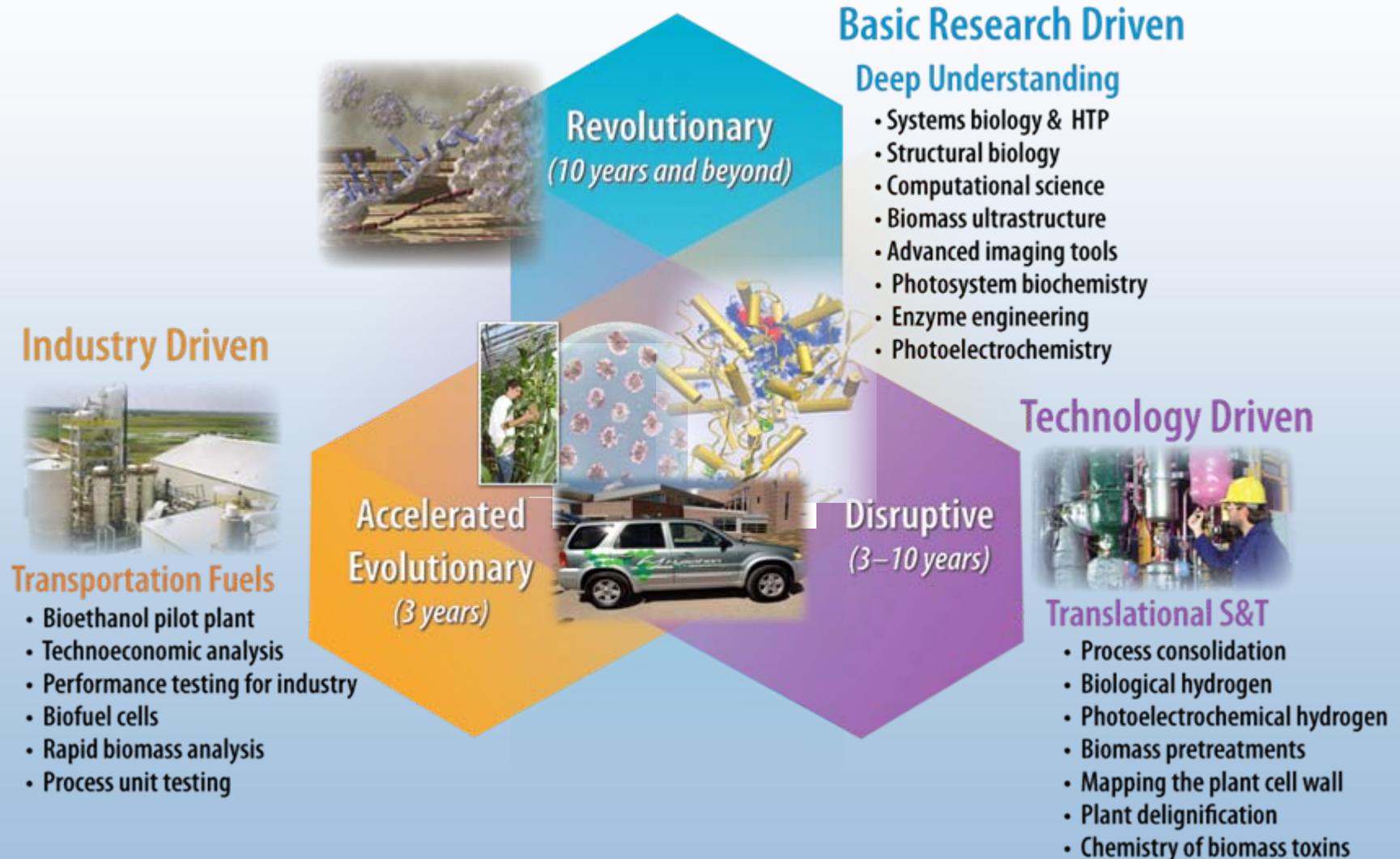
Mobilizing Capital

Policies

Markets



Technology Investment Pathways



Key Challenges

- Dramatically increase vehicle efficiency
- Expand and diversify fuel production from clean sources
- Transform transportation (vehicle/fuel) infrastructure

***Invest in technology innovation
to create long-term transportation opportunities***