NEW VEHICLE TECHNOLOGIES
FOR GHG REDUCTIONS

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Mobile Sources Technical Review Subcommittee
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Technologies Needed for GHG Reductions

Advanced Propulsion Technology Strategy

- Improved Vehicle Fuel Economy & Emissions
- Displace Petroleum
- IC Engine and Transmission Improvements
- Hybrid Electric Vehicles (including Plug-In HEV)
- Battery Electric Vehicles
- Hydrogen Fuel Cell

Energy Diversity

- Petroleum (Conventional & Alternative Sources)
- Bio Fuels (Ethanol E85, Bio-diesel)
- Electricity (Conventional & Alternative Sources)
- Hydrogen
Add Increasing Levels of Technology

CAFE / Fuel Economy “Bang for the Buck”

Incremental Variable Cost [$]
Advanced diesel technology is available today and can help reduce our nation's dependency on foreign oil.

Diesel can improve fuel economy by an average of 30% and lower CO2 emissions when compared to equivalent gasoline engine.

Light duty diesels could grow from a 3% market share in 2004 to 12% in 2012 in U.S.

Diesels make up half of all passenger vehicles sold in Europe. About 2/3 of Chrysler products in Europe are diesel.
Special Edition 10th Anniversary GEM

- Commemorates 10 years of green transportation at Global Electric Motorcars LLC
- Battery-powered, zero tailpipe emission vehicles
- Available as 2-, 4- and 6-passenger models, utility vehicles
- More than 35,000 GEM neighborhood electric vehicles worldwide
- Driven combined 200 million miles, preventing 150 tons of tailpipe pollutants and saving nearly 10 million gallons of gasoline
- Used in master planned communities, university and corporate campuses, and local, state and national government agencies
- Recognized by WestStart-CALSTART with 2007 Blue Sky Merit Award for its positive impact on air quality in California
2009 Chrysler Aspen HEMI® Hybrid

- Hybrid fuel efficiency combined with full-size SUV performance, capability and utility

- HEMI® with Multiple Displacement System coupled with hybrid technology

- Combination of low- and high-speed electric continuously variable transmission (ECVT) modes creates advanced, two-mode hybrid

- Delivers more than 25 percent overall fuel economy improvement

- Full-size SUVs boast nearly 40 percent fuel economy improvement in the city

- 6,000 pounds towing capability

- Repealed some oil and gas incentives.

- Forces 36 billion gallons of alternative fuel into the transportation fuel pool without consideration of whether customers will buy it.

- Resets fuel economy standards for cars and trucks at 35 miles per gallon overall new vehicle fleet average by 2020.

- Replaces light bulbs.
Fundamentals of Sound Energy Policy

- Aim at enhancing energy security by addressing
  - Availability
  - Commercial and social sustainability
  - Uses all available energy sources in an intelligent way

- Aim at creation of alternatives to energy that is currently obtained from use of depleting fossil fuels.

- Aim at reducing emissions of carbon in all sectors.

- Bring the customer into the program.
U.S. CO2 Emissions (Man-Made) by sector

- Ultimately, we need an economy-wide response on energy.
- Economy-wide is needed to achieve scale necessary to balance cost.
- Personal transportation – passenger cars and light trucks – make up 20 percent of U.S. CO2 emissions.
How Much Petroleum Can Biofuels Displace?

- Various bio-fuels scenarios demonstrate that petroleum consumption can be reduced.
- Petroleum consumption can be reduced by over 30% compared to DOE’s projections if:
  - All Gasoline is E10
  - All Diesel fuel is B20
  - 30% E85 FFV production in 2010 with 100% E85 use
  - 50% E85 FFV production in 2012 with 100% E85 use
Ethanol Use Capacity

Capacity to use Ethanol – E10 + E85 Vehicles *

Fuel – Billions of Gallons/Year

Renewable Fuel Standard

* Air Improvement Resources, Inc.
Limitations of Renewable Fuel Standard (RFS)

- RFS does not assure alternative fuel will be preferred by the consumer over regular gasoline and diesel fuel.

- RFS specifies the volume of alternative fuel to be introduced into commerce over a prescribed time, but not a mechanism to insure its use.

- RFS does not ensure the de-carbonization of fuel on a lifecycle basis, within the transportation fuel pool.
Create Carbon Cap on Fuel – which would result in fuels being priced at a point where customers will prefer to buy it

Precedent in auto industry: CAFE standards focus on performance, let the industry determine how to meet standards

Carbon Cap would enable fuel industry to determine best mix of blends, markets and pricing to achieve required carbon limits
Summary

- Energy reduction must be addressed economy-wide and at least nation-wide to achieve necessary scale.

- Transportation accounts for 20% of man-made GHG emissions leaving another 80% to be addressed.

- Transportation sector GHG reductions will be accomplished by:
  - Advancing vehicle energy conversion technologies.
  - Introducing an expanded array of vehicles capable of using alternate fuels such as ethanol and bio-diesel.
  - Adding a carbon cap on liquid fuels.
  - Educating consumers as to how to use transportation energy more efficiently.

- Research necessary to reduce the cost and address other environmental and social concerns of deploying new transportation technology and alternate fuel must be completed.
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