



# **Biofuels: Ensuring and Sustaining Competitiveness**

**David Friedman**

**2007 Biobased Industry Outlook Conference**

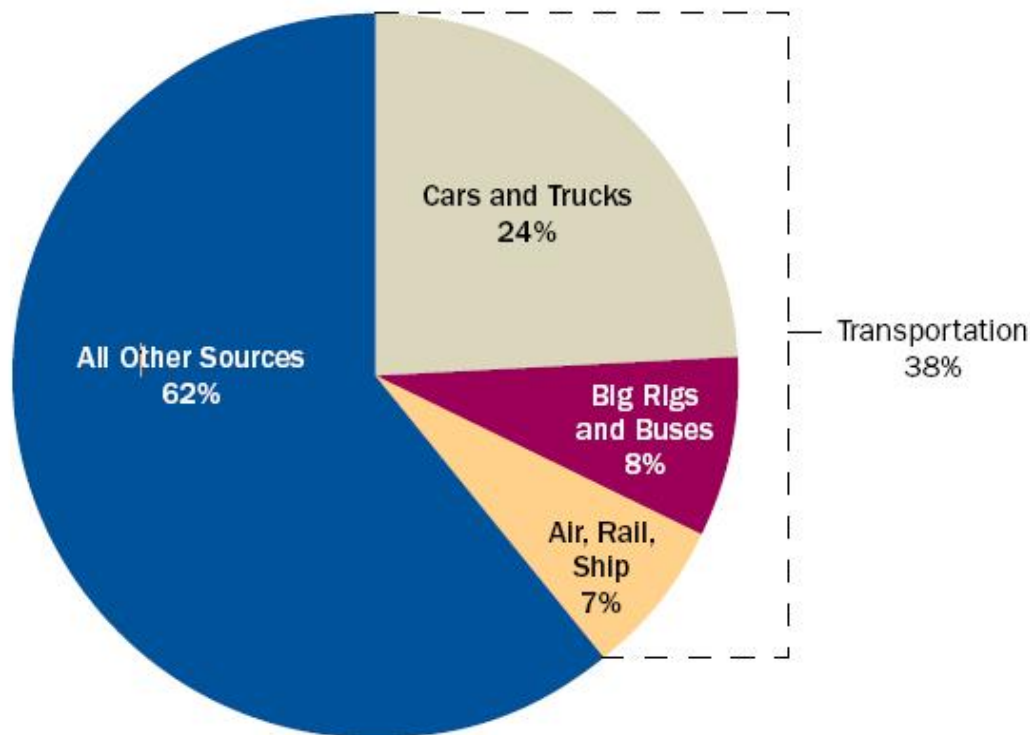
**November 6, 2007**

# Our Oil Addiction

- US Oil and Petroleum Products: over 20 million barrels per day
- Imports: 60% at about \$1 billion per day
- US light-duty cars and trucks ~ 40% US oil use

# Global Warming Pollution

FIGURE 1 Transportation's Share of U.S. Heat-trapping Emissions (2005)

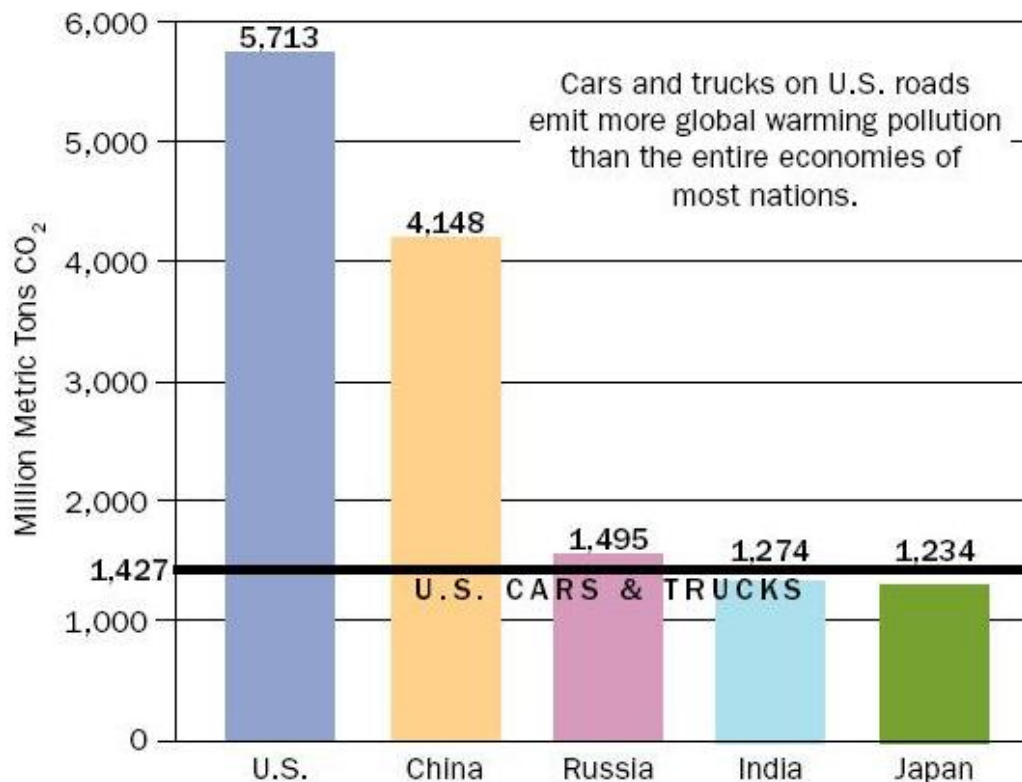


NOTE: Totals for sectoral emissions have been rounded.

SOURCE: Tailpipe emissions data from the U.S. Environmental Protection Agency (EPA 2007a). To estimate full fuel cycle emissions, we applied the emissions factor for gasoline (50% reformulated gasoline and 50% conventional) from Wang (2006). For sectoral emissions, this factor is a gross approximation, since each transportation fuel (e.g., diesel, jet fuel, locomotive fuel, marine fuel) will have a unique upstream carbon footprint.

# Global Warming Pollution

**FIGURE 2 Top Five Global Warming Polluters from Fossil Fuel Combustion (2004)**



NOTE: To estimate full fuel cycle emissions, we applied the emissions factor for gasoline (50% reformulated gasoline and 50% conventional) from Wang (2006).

SOURCES: Data for China, Russia, India, and Japan from Marland et al. (2007). Data for U.S. economy-wide emissions and car and truck tailpipe emissions from the EPA (2007a).

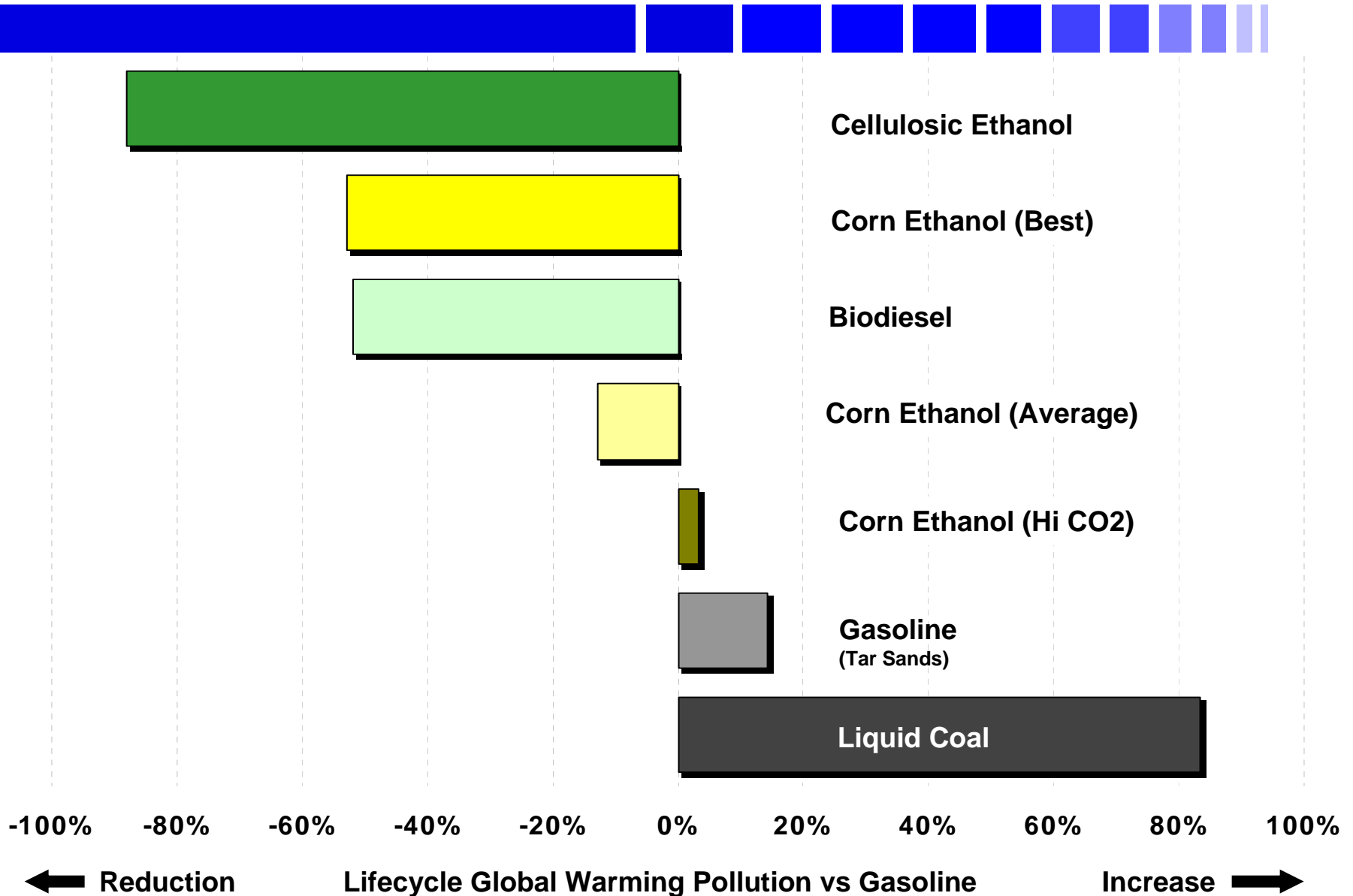
# Sketching Out Competition



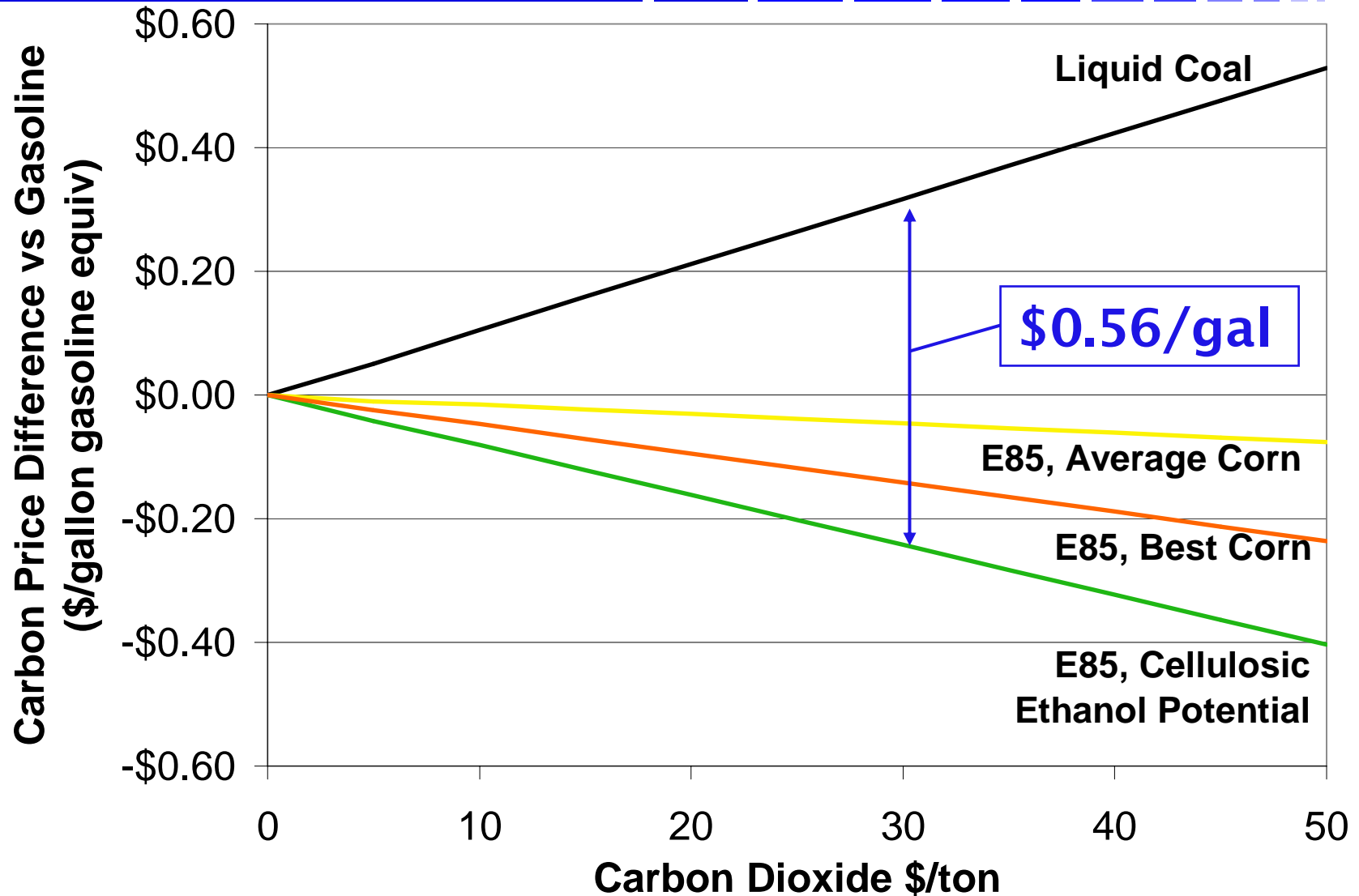
	Imports	Global Warming	Cost	Infrastructure	Readiness
Gasoline	- -	-	-	+	++
Liquid Coal	++	--	+	+*	?
Tar Sands	-	-	-	+	+
Conventional Ethanol	++	+ -	-	-	++
"Advanced" Biofuels	++	++	+	-	?
Hydrogen	++	++	?	--	--
Electricity	++	++	+	-	--

This is a very rough, personal assessment.

# Global Warming Pollution: Renewable and Alternative Fuels

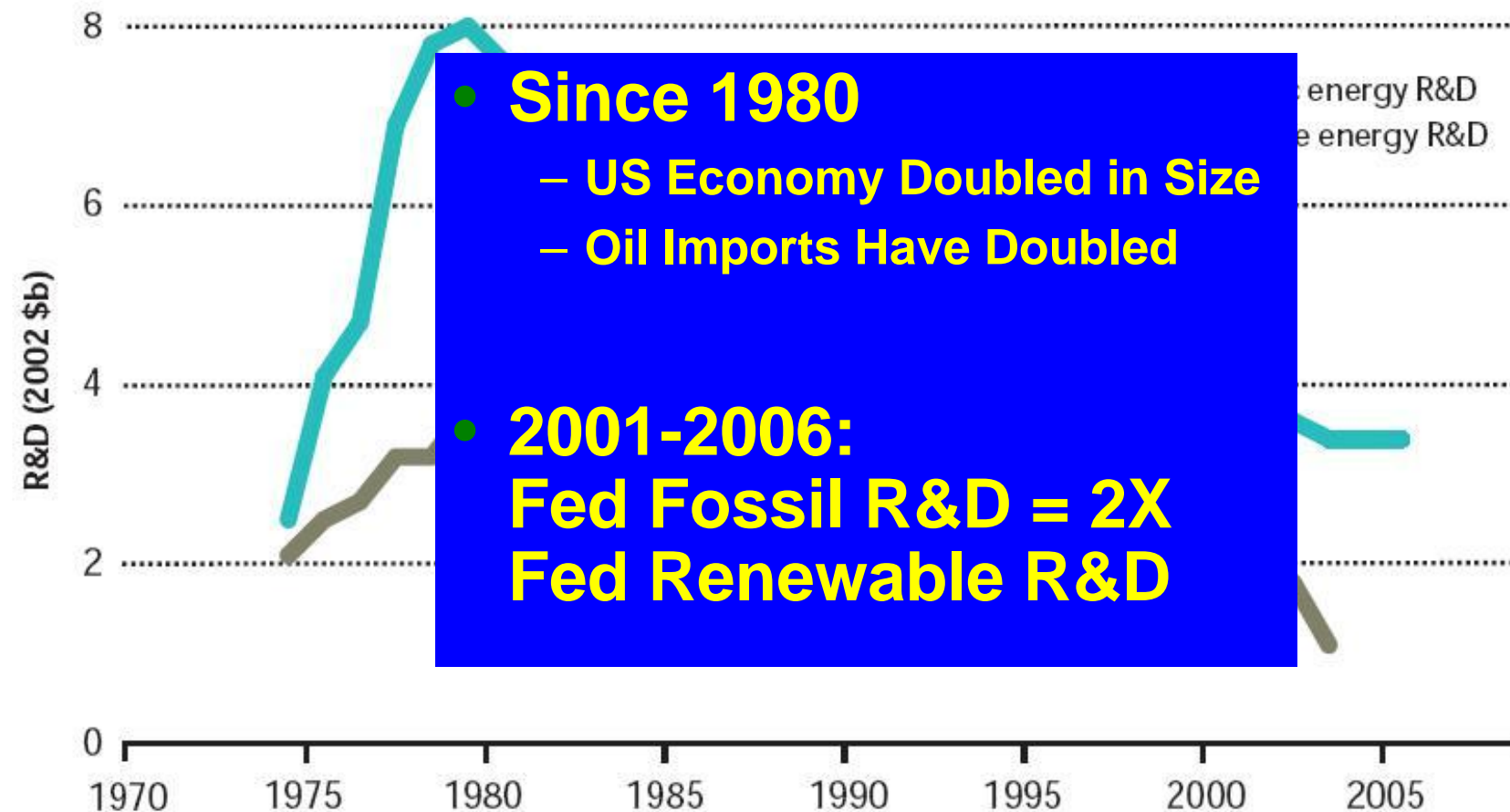


# A Competitive Market by Counting "Carbs"



# Put Your Money Where Your Mouth Is

Declining energy R&D investment by both public and private sectors



# Keep a Fuel of the Future around for the Future

## Mountain top removal mining for coal



**And leave fuels of the past in the past.**

# UCS Vanguard: Partnering with Complimentary Technologies

- Uses technology in today's cars
- 40% reduction in Emissions
- Consumer saves thousands of dollars!!

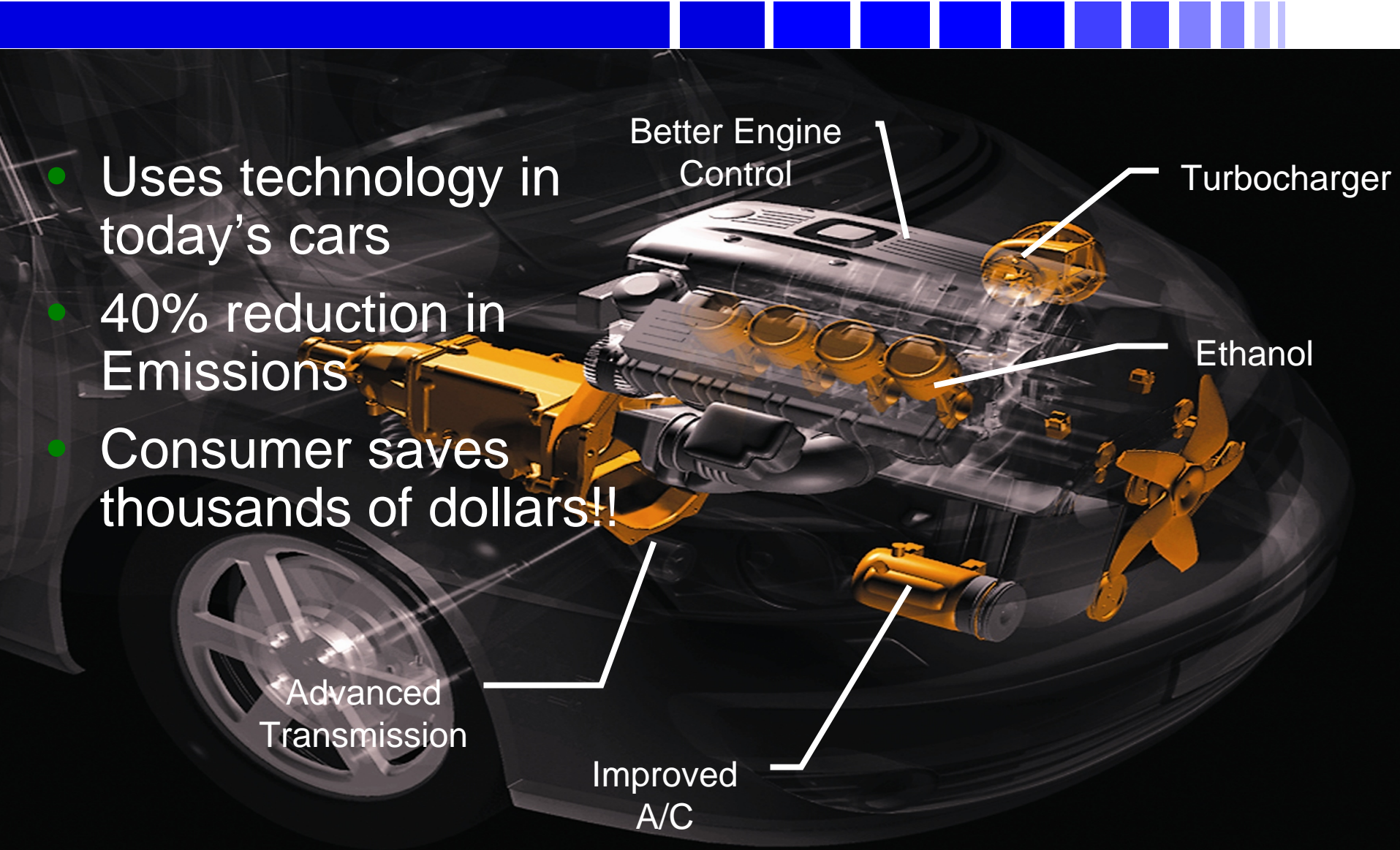
Better Engine Control

Turbocharger

Ethanol

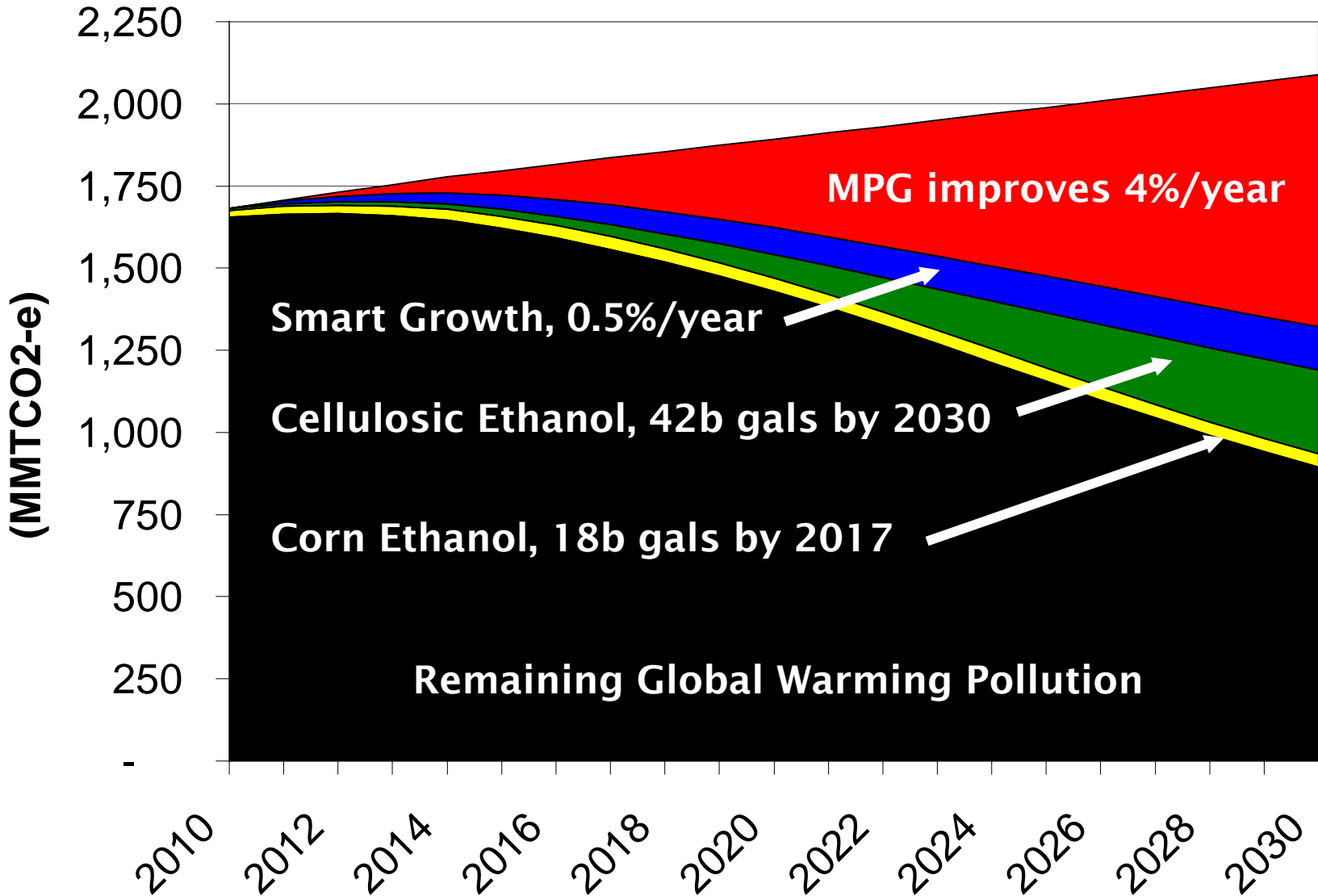
Advanced Transmission

Improved A/C



# A Portfolio of Policies

**Car and Truck Global Warming Pollution**



**Thank You**

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