

DOE DEER Conference Panel Discussion on "Future of Internal Combustion Engines" October 4, 2011

Drop In Fuels: Where the Road Leads

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Factors that could cause actual results or events to differ materially include, but are not limited to, crude oil and natural gas prices; refining and marketing margins; potential failure to achieve, and potential delays in achieving expected reserves or production levels from existing and future oil and gas development projects due to operating hazards, drilling risks, and the inherent uncertainties in interpreting engineering data relating to underground accumulations of oil and gas; unsuccessful exploratory drilling activities; lack of exploration success; potential disruption or unexpected technical difficulties in developing new products and manufacturing processes; potential failure of new products to achieve acceptance in the market; unexpected cost increases or technical difficulties in constructing or modifying company manufacturing or refining facilities; unexpected difficulties in manufacturing, transporting or refining synthetic crude oil; international monetary conditions and exchange controls; potential liability for remedial actions under existing or future environmental regulations; potential liability resulting from pending or future litigation; general domestic and international economic and political conditions, as well as changes in tax and other laws applicable to ConocoPhillips' business.

Other factors that could cause actual results to differ materially from those described in the forward-looking statements include other economic, business, competitive and/or regulatory factors affecting ConocoPhillips' business generally as set forth in ConocoPhillips' filings with the Securities and Exchange Commission (SEC), including our Form 10-K for the year ending December 31, 2008. ConocoPhillips is under no obligation (and expressly disclaims any such obligation) to update or alter its forward-looking statements, whether as a result of new information, future events or otherwise.

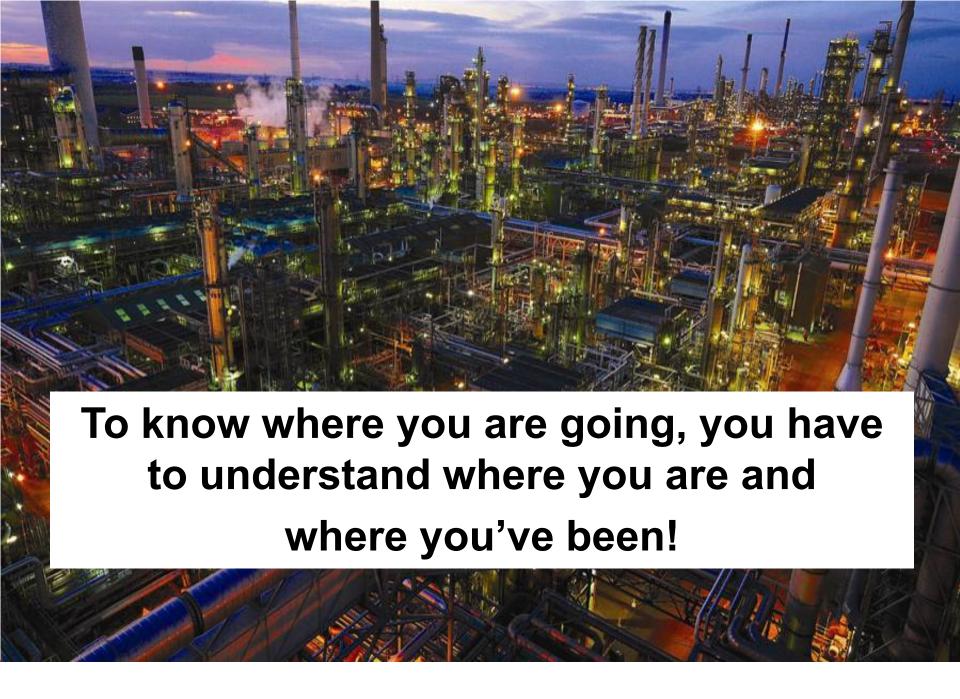
Cautionary Note to U.S. Investors – The U.S. Securities and Exchange Commission permits oil and gas companies, in their filings with the SEC, to disclose only proved reserves that a company has demonstrated by actual production or conclusive formation tests to be economically and legally producible under existing economic and operating conditions. We may use certain terms in this presentation such as "oil/gas resources," "oil in place," "recoverable bitumen," "exploitable bitumen in place," and "bitumen in place" that the SEC's guidelines strictly prohibit us from including in filings with the SEC. The term "reserves," as used in this presentation, includes proved reserves from Syncrude oil sands operations in Canada which are currently reported separately as mining operations in our SEC reports. Under amendments to the SEC rules, mining oil sands reserves will no longer be reported separately. U.S. investors are urged to consider closely the oil and gas disclosures in our Form 10-K for the year ended December 31, 2008.

### **Outline**

Timeline of Fuels Transition

- Key Industry Drivers
- Renewable Fuels Mandate

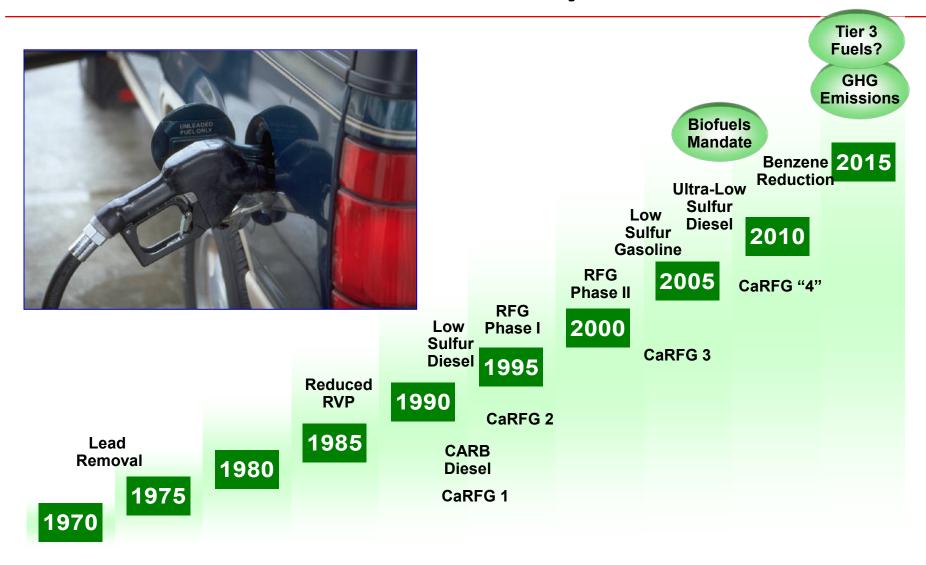
- Drop-In Fuel Pathways
- Summary



#### **Timeline of Fuels Transition - Historical Events**

- 1970s Gasoline Lead Removal
- 1980s Volatility Controls
- 1990s Reformulated Gasoline & Diesel Sulfur Reduction
- 2000s Gasoline & Diesel Desulfurization and Renewable Fuels
- 2010+ Benzene Reductions
   GHG and LCFS

### **Evolution of Fuel Quality Mandates**



### **KEY Industry Drivers**

- Renewable Fuel Mandates
- Low Carbon Fuels Standard (LCFS) California
- CAFÉ Standards: Current and Proposed
- U.S. Light-Duty Vehicle Sales Rebound?
- Incremental Costs of Increased Fuel Efficiency

#### **Renewable Fuels Mandates**

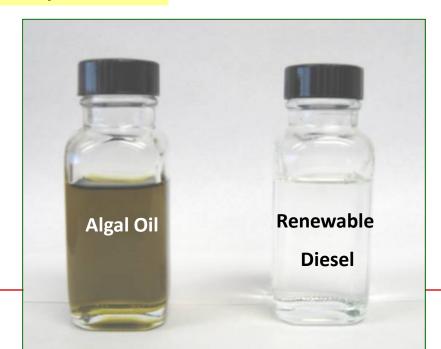
#### 2005/2007 – Renewable Fuels (RF) Standards

- EPAct05 7.5 Billion Gallons RF
- EISA07 36 Billion Gallons RF by 2022
  - 4 Categories of RF
    - Bio-massed Based Diesel
    - Non-Advanced
    - Other Advanced
    - Advanced Cellulosic

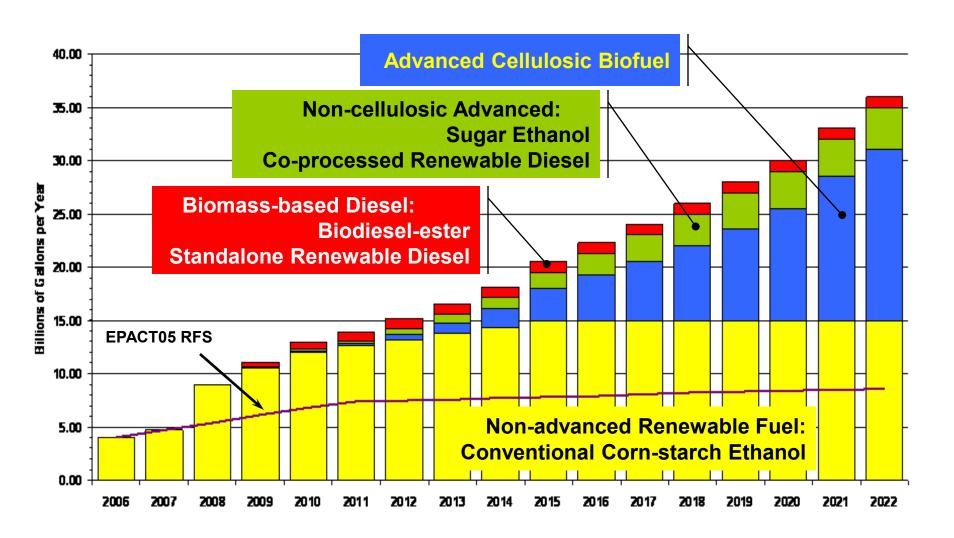
**Predominately Ethanol** 

- Energy Differences
  - Neat Gasoline:
    - @ ~125,000\* BTU/gallon
  - Ethanol
    - @ ~84,500\* BTU/gallon (1/3 less than gasoline)

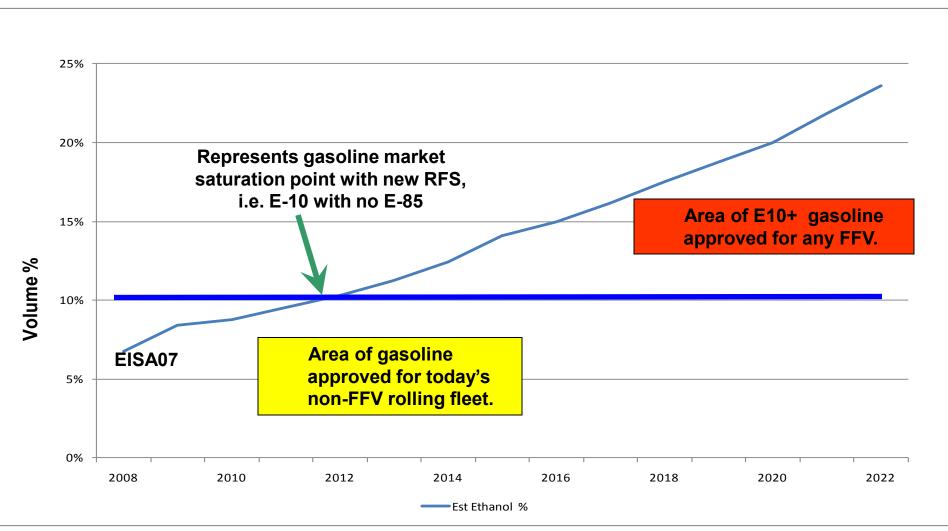
\* Source: EIA AEO2011



### EISA07 Renewable Fuel Standard (2007-2022)

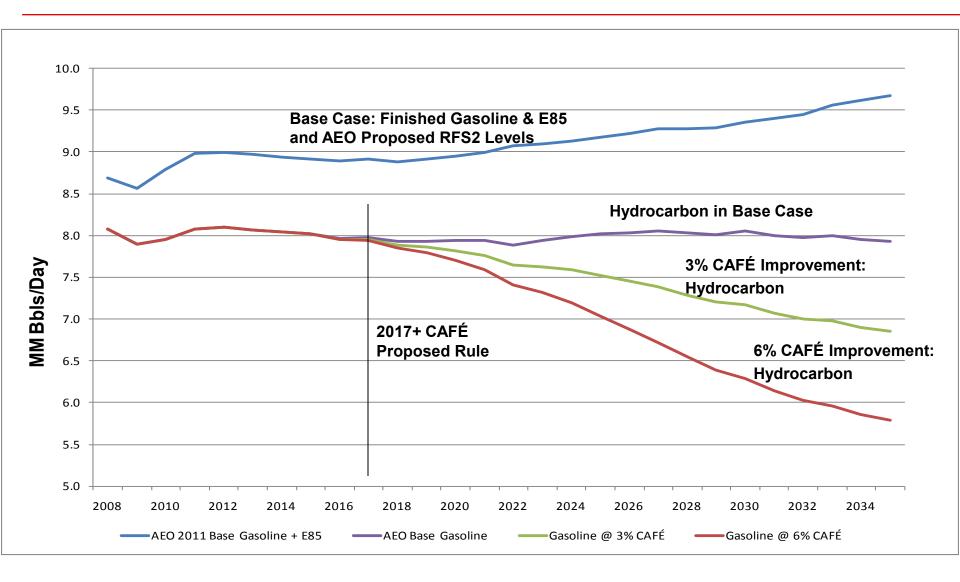


#### **Estimated Volumetric Ethanol % of Gasoline Pool**



Source: Base Gasoline demand from EIA AEO 2011 and DOE VISION model

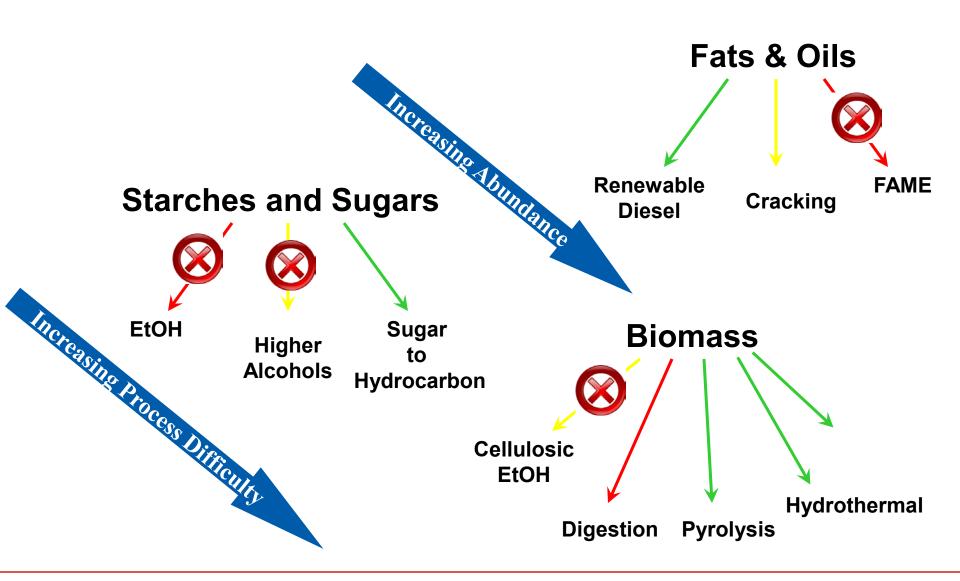
### **Projected Impact on Hydrocarbon Fuels**



# What is a Drop-In Fuel?

- Fully compatible with current vehicles
- Fully compatible with current infrastructure
- Energy content same as traditional fuels
- Same molecules as in traditional fuels

# **Drop-in Fuel Pathways**



# Petroleum, Renewable & Biodiesel

$$CH_3(CH_2)_7CH_2CH_2(CH_2)_7CH_3$$

Petroleum Diesel

$$CH_3(CH_2)_7CH_2CH_2(CH_2)_7CH_3$$

Renewable Diesel

$$CH_3OC(CH_2)_7CH=CH(CH_2)_7CH_3$$

Biodiesel or Fatty Acid Methyl Ester (FAME)

## Summary

While the challenges of Corporate Average Fuel Economy and the Renewable Fuels Standard are imminent, hydrocarbon in motor vehicle fuels continue to have a viable future for decades to come!

# The Road Ahead Will Be Challenging



The Vehicle/Fuel Relationship Remains Strong!