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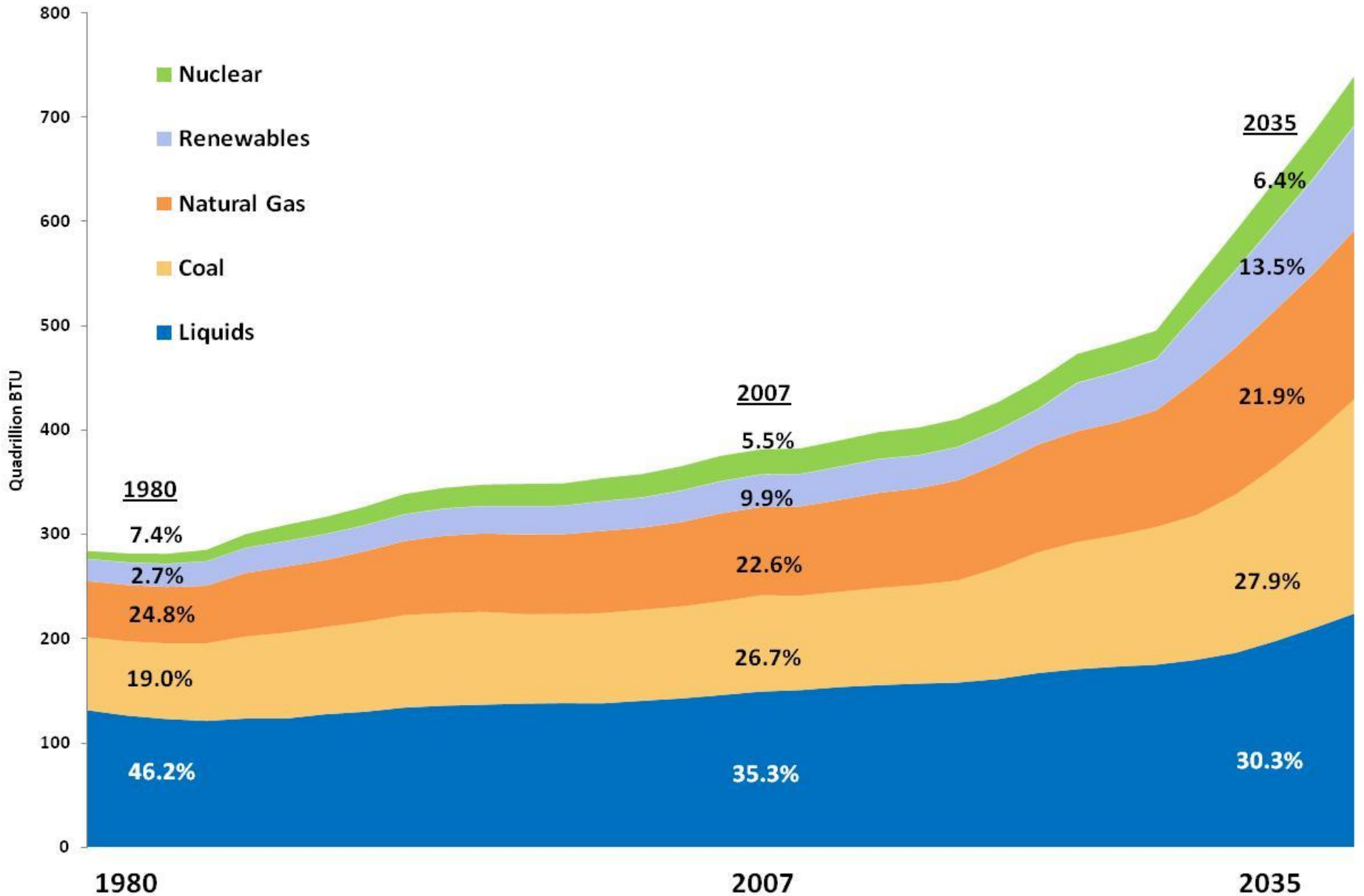
# Renewable Fuels Issues

Patrick Kelly  
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March 28, 2011

API International Trade and  
Customs Conference  
Houston, TX

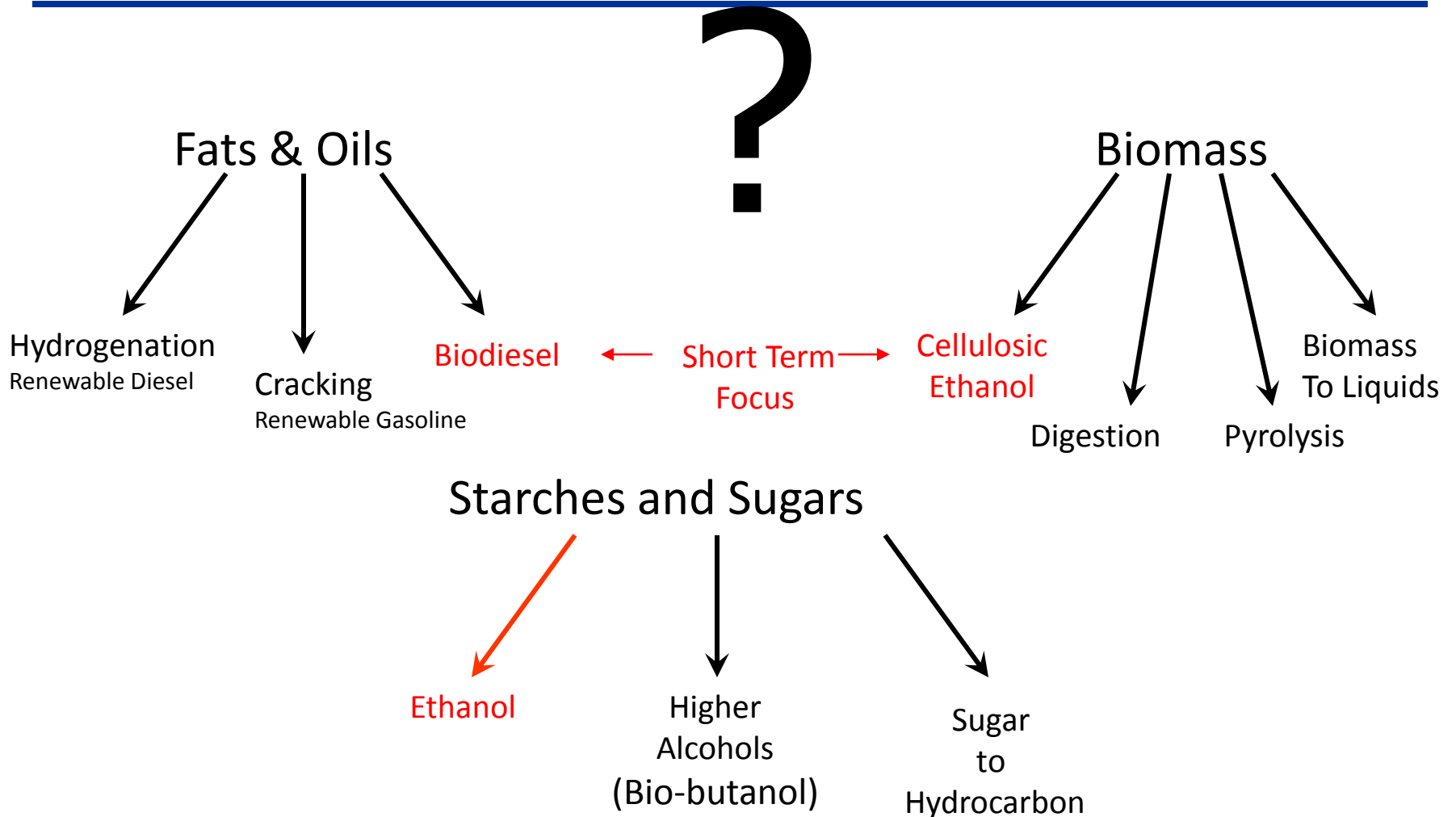
- Given the current and projected worldwide energy demand, The U.S. needs *all* sources of commercially viable energy, as well as a greater commitment to energy efficiency and energy conservation
  - ✓ Biofuels, including ethanol are an important resource
- Almost 90% of all gasoline now produced in the U.S. includes a 10% blend of ethanol
- API members have long been pioneers in developing alternatives and expanding our utilization of existing sources of energy
- RFS2 mandates are law and the blend wall is approaching
- Increased amounts of renewable fuels are likely

# Future Global Energy Demand (The world will require 49 percent more energy in 2035 than in 2007)

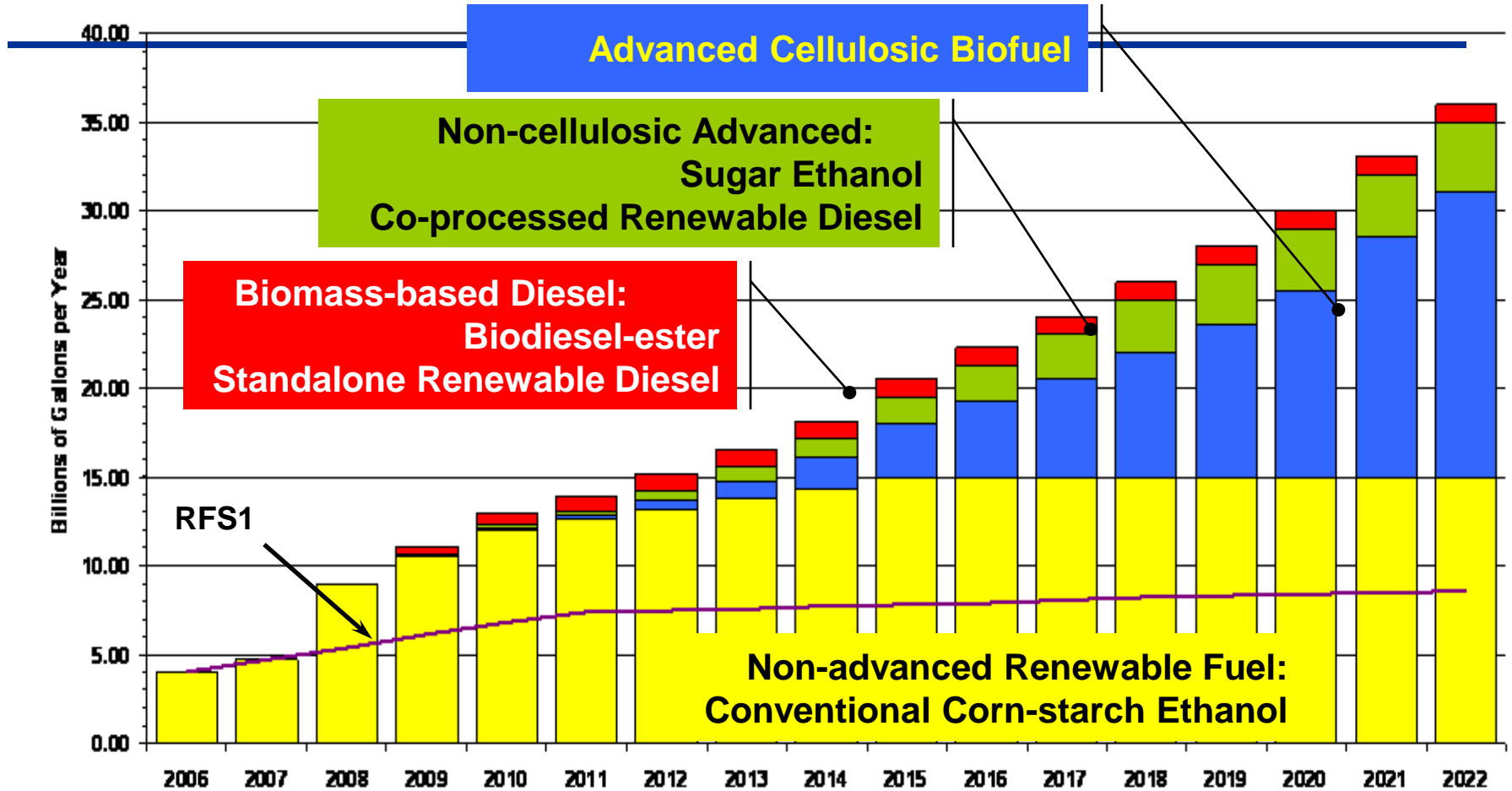


Source: EIA, International Energy Outlook 2010

# Too Early to Pick Winners/Losers



# EISA Renewable Fuel Standard (2007-2022)



**50% GHG**

**50% GHG**

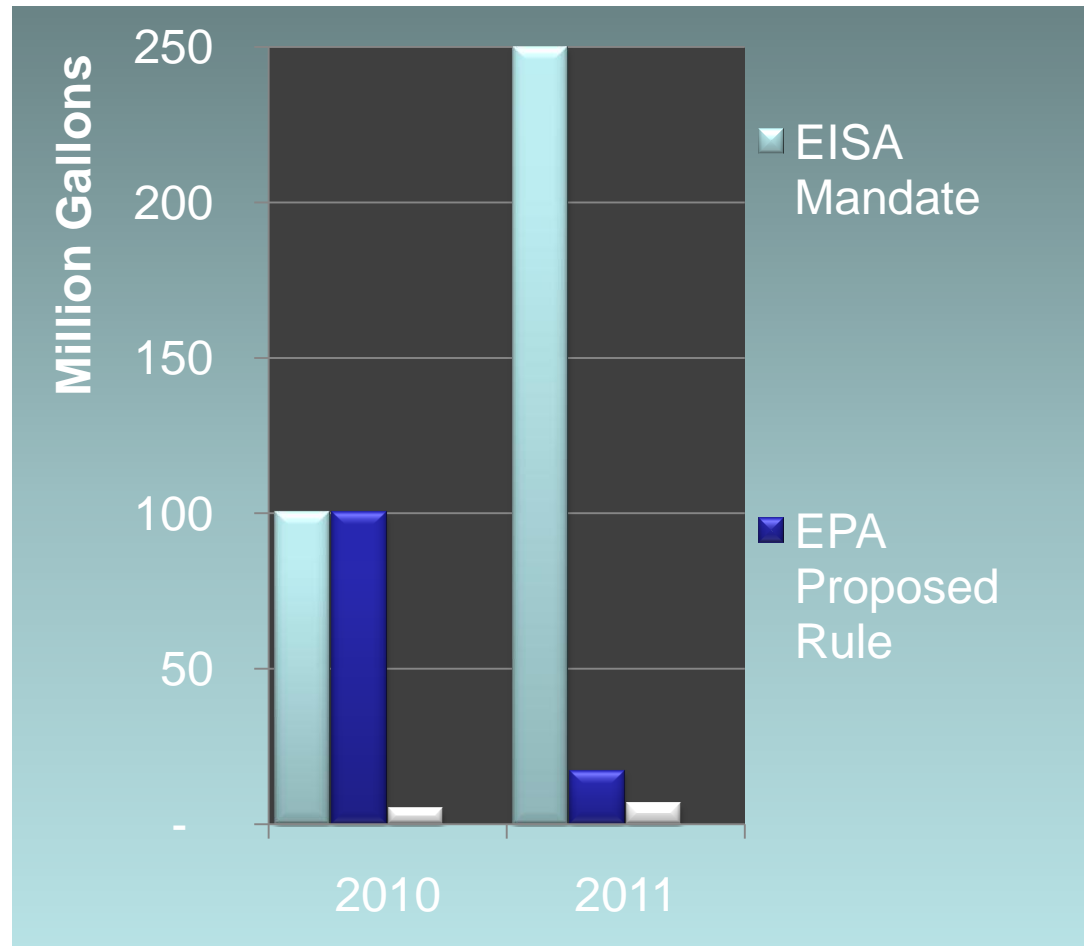
**60% GHG**

**20% GHG\***

\*For new construction only. Existing corn-based ethanol facilities have no reduction requirement.

# Cellulosic Mandates

- Feasibility reviews are necessary to any technology forcing program
- EPA continues to make overly optimistic projections of cellulosic biofuel availability
- Mandated volumes should be based on 3 months of continuous operation



# Renewable Blendwall

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- When does industry hit the blendwall?
  - 2010 – Obligated Parties Required to blend over 10%
    - Must rely on RIN market or credit carryover
    - Small Refiners become obligated parties in 2011
  
- What are affects if E15 partial waivers are utilized
  - 2014 Based on EIA projections (AEO2011)
  
- Principal blendwall determinant -- **Gasoline demand**
  - Lower gasoline usage would make the blendwall occur sooner
  - Many other factors will impact the timing, including:
    - Cellulosic Waivers
    - Vehicle Fleet turnover
    - FFV market penetration

To meet the RFS, ethanol can be used in gasoline in 3 ways:

## 1. Up to 10% (by volume) blend

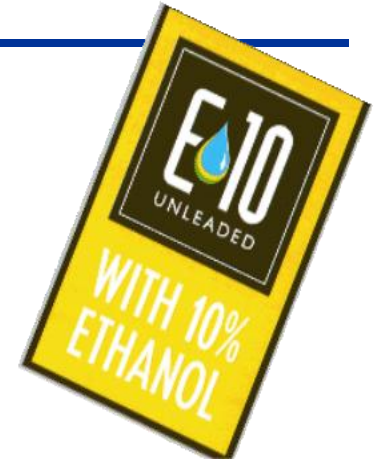
- Can be used in all vehicles and engines
- Ethanol above 10% volume can't be used in non-flexible fuel vehicles -- E10 "blend wall"

## 2. E10+ blend

- E10+ is gasoline containing ethanol at greater than 10% for use in conventional (non-flexible fuel) vehicles
- EPA granted waivers allowing the use of E15 in 2001 and newer vehicles

## 3. E85

- An alternative fuel containing 70-85% ethanol which must be used in a flexible-fuel vehicle



# E15 Partial Waiver

- October 13, 2010 – EPA granted partial waiver for E15 in MY 2007 and newer light duty vehicles
- January 21, 2011 – EPA granted partial waiver for E15 in MY 2001-2006 light duty vehicles
- Did not approve E15 for older vehicles (pre-2001)
- Did not approve for use in heavy duty vehicles or nonroad equipment



➤ ***Partial waiver includes four conditions***



# Conditions on E15 Waiver

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Conditions to reduce the potential for misfueling include the following:

- Manufacturers and Sellers of E15 must submit a plan addressing the conditions of the waiver to EPA for approval
- Retail fuel dispensers must have labels indicating that E15 is only for use in MY2001 and newer motor vehicles
- Product Transfer Documents (PTDs) must accompany all transfers of fuels for E15 use
- Parties must participate in a survey of compliance at fuel retail dispensing facilities to ensure adequate enforcement of labeling requirement.



# Justification for E15 Waiver Approval

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- Long Term and Immediate Exhaust Emissions Impacts
  - Long Term and Immediate Evaporative Emissions Impacts
  - Impact of Materials Compatibility on Emissions
  - Impact of Drivability and Operability on Emissions
- 
- The DOE/CRC Catalyst Durability Study was applied as justification for areas outside the intended scope (materials compatibility, OBD, evaporative testing, engine wear, drivability, etc.)
-

# EPA's E15 Waiver Decision was Premature

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- API's primary goal is customer satisfaction and program success at the consumer level
  - Premature action puts consumer satisfaction at risk
  - If customer satisfaction is compromised, the credibility of our industry and the RFS2 program will be questioned and challenged
- There is extensive vehicle testing currently underway that must be completed
  - Emissions systems issues (e.g., evaporative durability, OBD) *and*
  - Vehicle performance issues (e.g., base engine durability, which influences customer expectations, safety and could also reveal an emissions issue)
  - Interim reports show problems with E20, and indicate potential problems with E15 that must be further investigated
- Extensive infrastructure testing is also underway



# Manufacturer Limits on Allowable Ethanol Content in Conventional Vehicles

**Table 5-1**  
**Manufacturer Limits on Allowable Ethanol Content in Conventional Vehicles**  
 (Based on Owners Manual Review Conducted by Herman and Associates)

<b>Manufacturer</b>	<b>1999</b>	<b>2000</b>	<b>2003</b>	<b>2006</b>	<b>2009</b>	<b>2010</b>
Audi	10%	10%	-	10%	10%	10%
Bentley	- <sup>a</sup>	-	-	10%	10%	10%
BMW	10%	10%	10%	10%	10%	10%
Chrysler	10%	10%	10%	10%	10%	10%
Ford	10%	10%	N.S.	10%	10%	10%
GM	N.S. <sup>b</sup>	N.S.	N.S.	N.S.	10%	10%
Honda/Acura	10%	10%	10%	10%	10%	10%
Hyundai	10%	10%	10%	10%	10%	10%
Jaguar	10%	10%	10%	10%	10%	10%
Isuzu	-	N.S.	N.S.	10%	-	-
Kia	10%	10%	10%	10%	10%	10%

# New Transportation Fuel – What needs to happen

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- Sierra Research: Review of Regulations and Requirements
- Identification and Review of State/Federal Legislative and Regulatory Changes Required for the Introduction of New Transportation Fuels
  - “...the introduction of higher-level blends into the marketplace is not simple or straightforward”.
  - “EPA needs to recognize and consider these issues in addition to waiting for all of the emissions and performance data to be collected.”

# New Transportation Fuel What's required?

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State and Federal requirements must still be addressed, as well as practical challenges in bringing E15 to market

- EPA Regulations
  - Registration, Reformulated Gasoline modeling, detergency additives
- FTC and EPA Fuel Rating Labeling Requirements
- State Fuel Requirements
  - Blend level caps, vapor pressure limits, fire safety codes, NIST specifications
- ASTM Specifications

# New Transportation Fuel What's required?

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## Infrastructure Issues

- Dispensing Infrastructure Compatibility, Listing (UL Certification), Functionality
- Vehicle Manufacturer Warrantees and Owner's Manual Recommendations refer to E10
- Non-road engines
- Consumer Choice and Customer Satisfaction
- Pipeline and Terminal Infrastructure

# E10+ Research Overview

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## **\$3 MILLION WORTH OF INFRASTRUCTURE COMPATIBILITY TESTING**

### **US Department of Energy**

- NREL – Dispensers, Piping, Stage II Equipment and STPs
- ORNL – Component materials, UST coupons

### **US EPA Office of Underground Storage Tanks**

- Leak Detection Systems

### **API**

- Misfueling Mitigation Measures
  - Flame Arresters
  - Stage I Vapor Recovery Equipment
-

# Possible E15 Pump Labels

EPA (Proposal)

API

**CAUTION!**

This fuel contains 15% ethanol maximum

Use only in:  
2007 and newer gasoline cars  
2007 and newer light-duty trucks  
Flex-fuel vehicles

This fuel might damage other vehicles.  
Federal law *prohibits* its use in other  
vehicles and engines.

The EPA proposal label features a white background with an orange border. At the top, the word "CAUTION!" is written in bold red letters inside a white rectangular box with a red border. Below this, the text "This fuel contains 15% ethanol maximum" is written in orange. A white rectangular area with an orange border contains the text "Use only in:" followed by three lines: "2007 and newer gasoline cars", "2007 and newer light-duty trucks", and "Flex-fuel vehicles". At the bottom, the text "This fuel might damage other vehicles. Federal law prohibits its use in other vehicles and engines." is written in black.

**E15 Gasoline**  
Contains 11-15% Ethanol

**WARNING!**

**CONSULT YOUR VEHICLE, ENGINE & EQUIPMENT MANUFACTURERS' FUEL RECOMMENDATIONS**

**Approved only for use in:  
Flex Fuel Vehicles, or 2007 and  
Newer Cars and Light-duty Trucks**

Federal law PROHIBITS use in other  
vehicles and non-road engines &  
equipment. Its use may cause damage  
to vehicles, engines & equipment.

Fuel economy is less than E0 or E10 gasoline

The API label has a white background with a black border. At the top, "E15 Gasoline" is written in large bold black letters, with "Contains 11-15% Ethanol" below it in a smaller black font. A horizontal orange bar with the word "WARNING!" in white bold letters spans the width of the label. Below the bar, the text "CONSULT YOUR VEHICLE, ENGINE & EQUIPMENT MANUFACTURERS' FUEL RECOMMENDATIONS" is written in bold black letters. The next line reads "Approved only for use in:" followed by "Flex Fuel Vehicles, or 2007 and Newer Cars and Light-duty Trucks" in bold black letters. Below this, the text "Federal law PROHIBITS use in other vehicles and non-road engines & equipment. Its use may cause damage to vehicles, engines & equipment." is written in black. At the bottom, "Fuel economy is less than E0 or E10 gasoline" is written in a smaller black font.

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