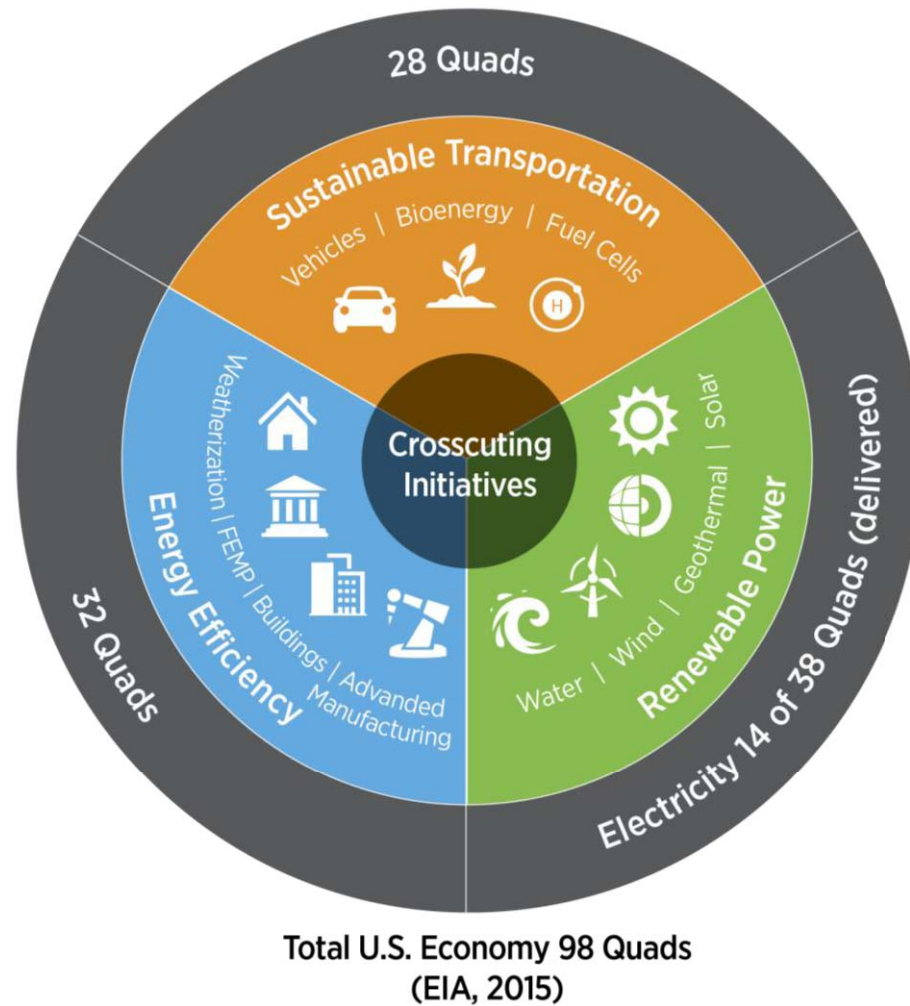


# EERE Overview - BETO Peer Review

March 2017

**Reuben Sarkar**  
Deputy Assistant Secretary  
Transportation

# EERE programs increase energy efficiency and develop sustainable options



- **Transportation: 93%** dependent on petroleum
- **Industry: On-site consumption 71%** petroleum or natural gas
- **Power: 35%** electricity generated from natural gas
- **Buildings: 80%** of electricity consumed

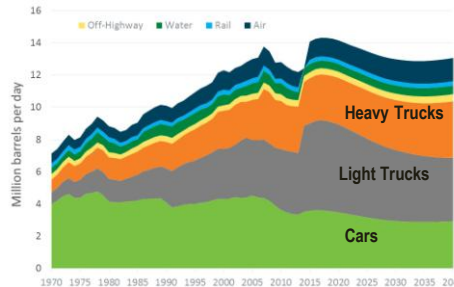
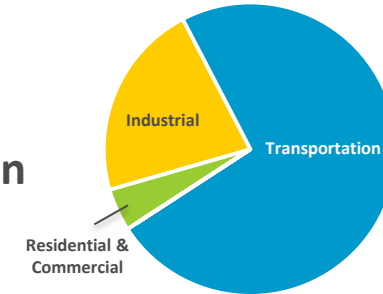
*Conduct applied R&D, validate performance, & reduce market barriers*

# Transportation & Energy Drivers



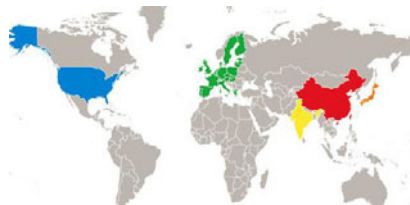
Transportation is **93%** dependent on petroleum

**70%** of total U.S. petroleum usage is for transportation



On-road vehicles account for **85%** of transportation petroleum usage

Transportation is the **2<sup>nd</sup>** most expensive spending category after housing



**75%** of cars & trucks are sold outside US - innovation drives US global competitiveness and domestic supply base

**Strategic Goal:** Improve **energy security**, **economic productivity**, and **competitiveness** while providing unprecedented access to **domestic, clean fuels** and **efficient, convenient, and affordable transportation** choices



## Sustainable TRANSPORTATION

Office of Energy Efficiency and Renewable Energy  
U.S. Department of Energy



**Fuel Diversification** | Domestic, Diverse, Alternative, Clean Fuels



**Vehicle Efficiency** | Energy Efficient Vehicle Technologies



**Mobility Systems** | Energy Efficient Transport Systems (People & Goods)



## Vehicles

- Advanced Combustion
- Fuels & Lubricants
- Material Technology
- Vehicle Systems
- Batteries
- Electric Drives
- Outreach, Deployment, Analysis

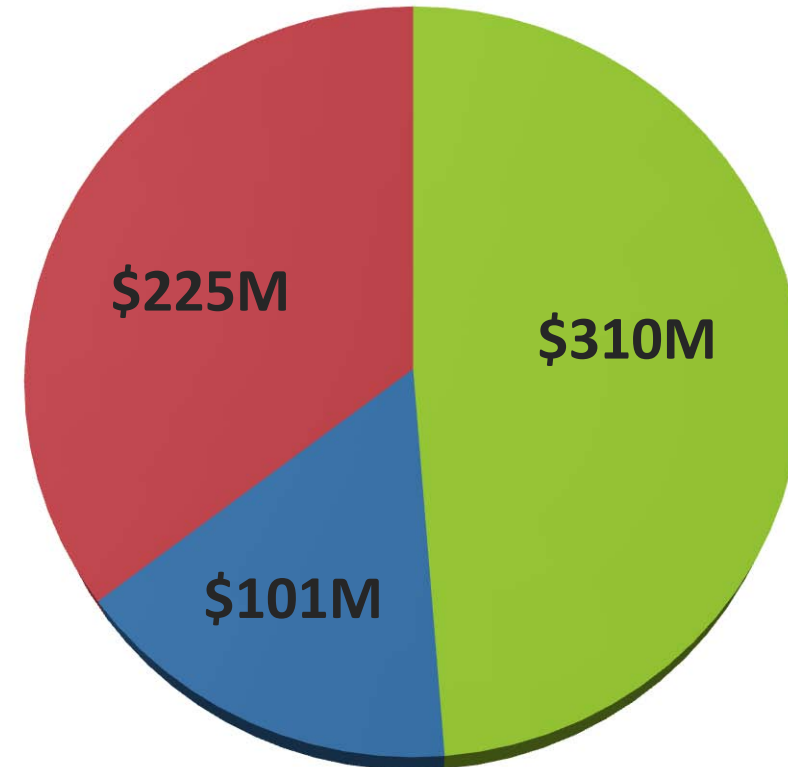
## Hydrogen & Fuel Cell

- Fuel Cell Systems
- Hydrogen Production & Delivery
- Safety Codes & Standards
- Technology Acceleration

## Bioenergy

- Drop-in Biofuels
- Bioproducts & Biopower
- Feedstocks & Logistics
- Conversion
- Demonstration
- Market Transformation

**\$636M FY16 Enacted**  
*(\$853M FY17 Request)*



■ Vehicles ■ Hydrogen & Fuel Cell ■ Bioenergy

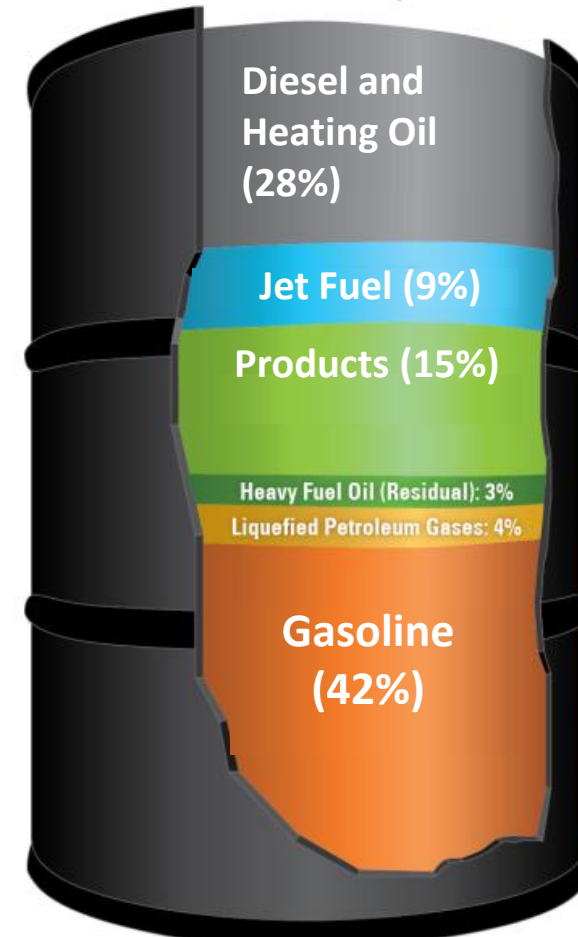
**1 billion tons of biomass can be produced sustainably in the U.S.**

- **50 billion gallons** (25% of U.S. transportation fuel)
- **50 billion lbs.** of high value chemicals
- **85 billion kWh** of electricity (power 7 million homes)
- **\$260 billion** in direct gross revenue contribution



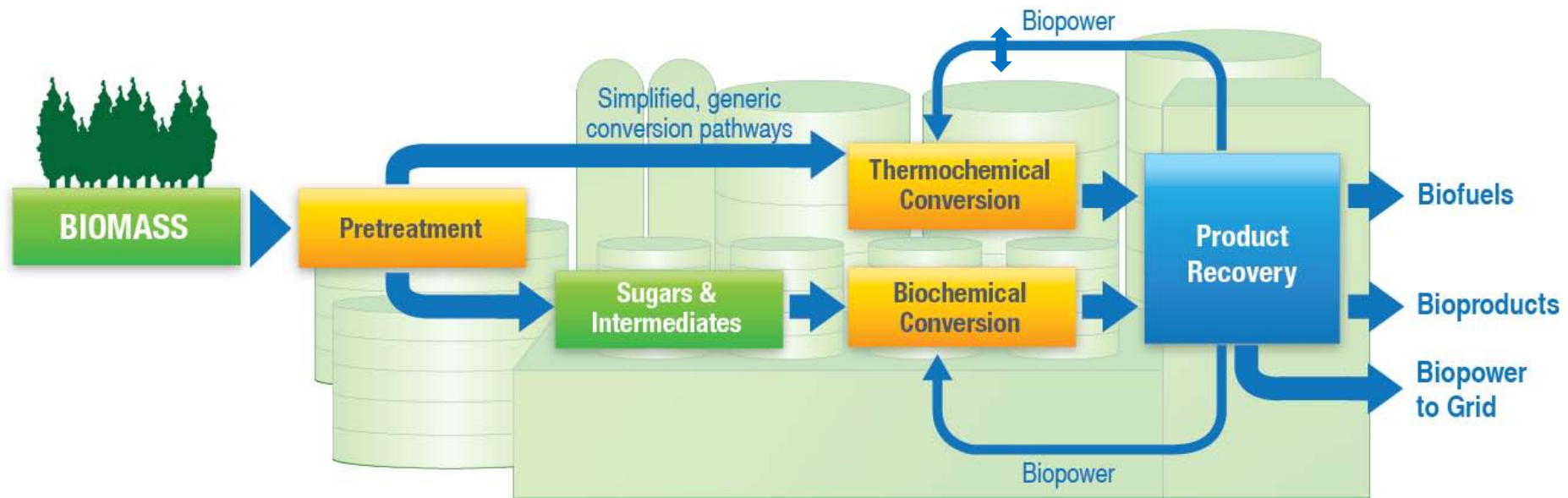
*Supports domestic economy and improves energy security*

- Only **~40% of a barrel** used to produce petroleum gasoline
- Increasing **energy security** by developing products from diverse, non-petroleum based sources
- R&D focus on **hydrocarbon “drop-in”** biofuels, jet fuels, and bio-based products



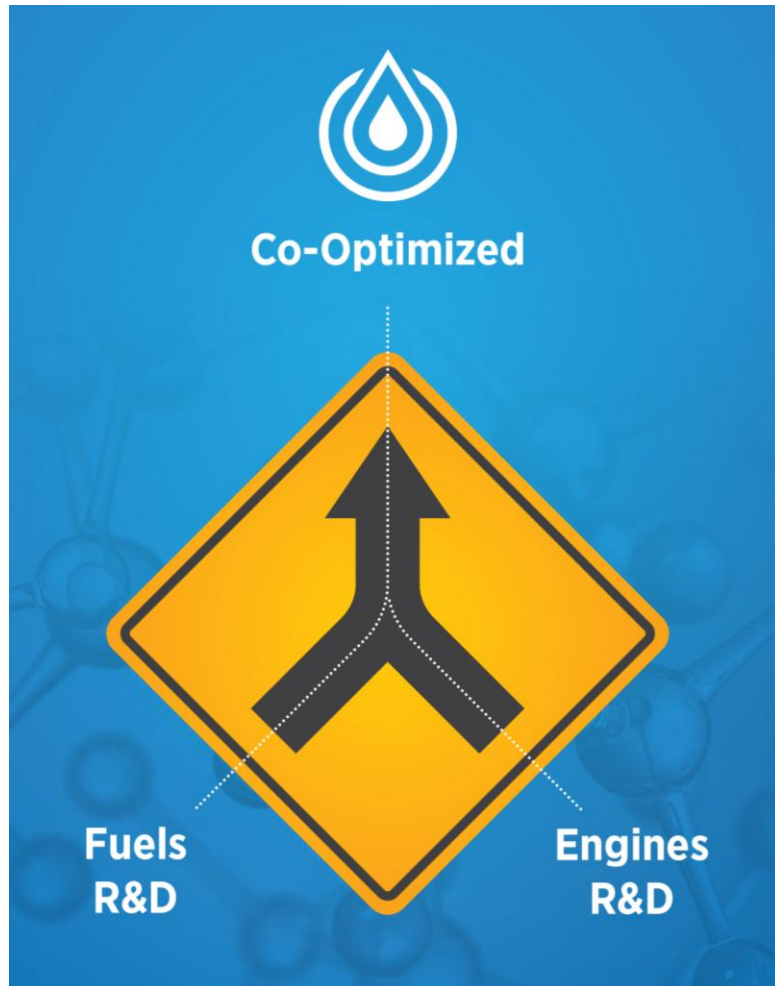
*Substituting an entire barrel with domestic fuels and feedstocks*

DOE works across entire supply chain from feedstocks to fuels & products



*Lowering technical risk and cost from lab R&D through production scale up*

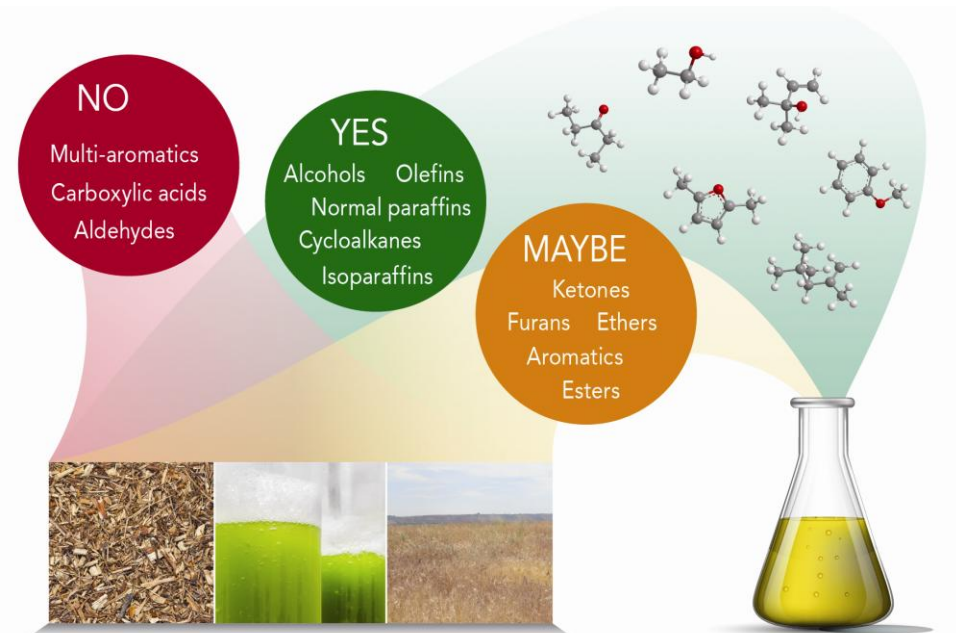




High performance, market-driven fuels enabling new high efficiency engines

## 9 National Labs in Partnership with Stakeholders:

-  **13** Light and heavy duty vehicle manufacturers
-  **8** Biofuel companies
-  **10** Oil companies/ Refiners and Retailers
-  **2** End consumer organizations



**Additional 15-20% fuel economy improvement possible (50% total)**



*Multi-lab consortium supporting R&D efforts*



# Sustainable TRANSPORTATION

Office of Energy Efficiency and Renewable Energy  
U.S. Department of Energy

## Questions

[Reuben.Sarkar@ee.doe.gov](mailto:Reuben.Sarkar@ee.doe.gov)