

DOCKET
06-AFP-1

DATE JUN 11 2007

RECD. JUN 11 2007

Renewable Diesel

“Keep Options Open”

June, 2007 Update


ConocoPhillips

Company Profile

- An international, integrated energy company. 11.4 billion BOE reserves
- The 3rd largest integrated energy company in the United States.
- 2nd largest refiner in U.S. – Approx 11% of the U.S. fuels market.
- 19 Refineries (15 wholly owned), 2.9 MBDP Worldwide.
- Pipelines and terminals operator for product and crude
- Approximately 38,000 employees worldwide
- Technology innovator and developer



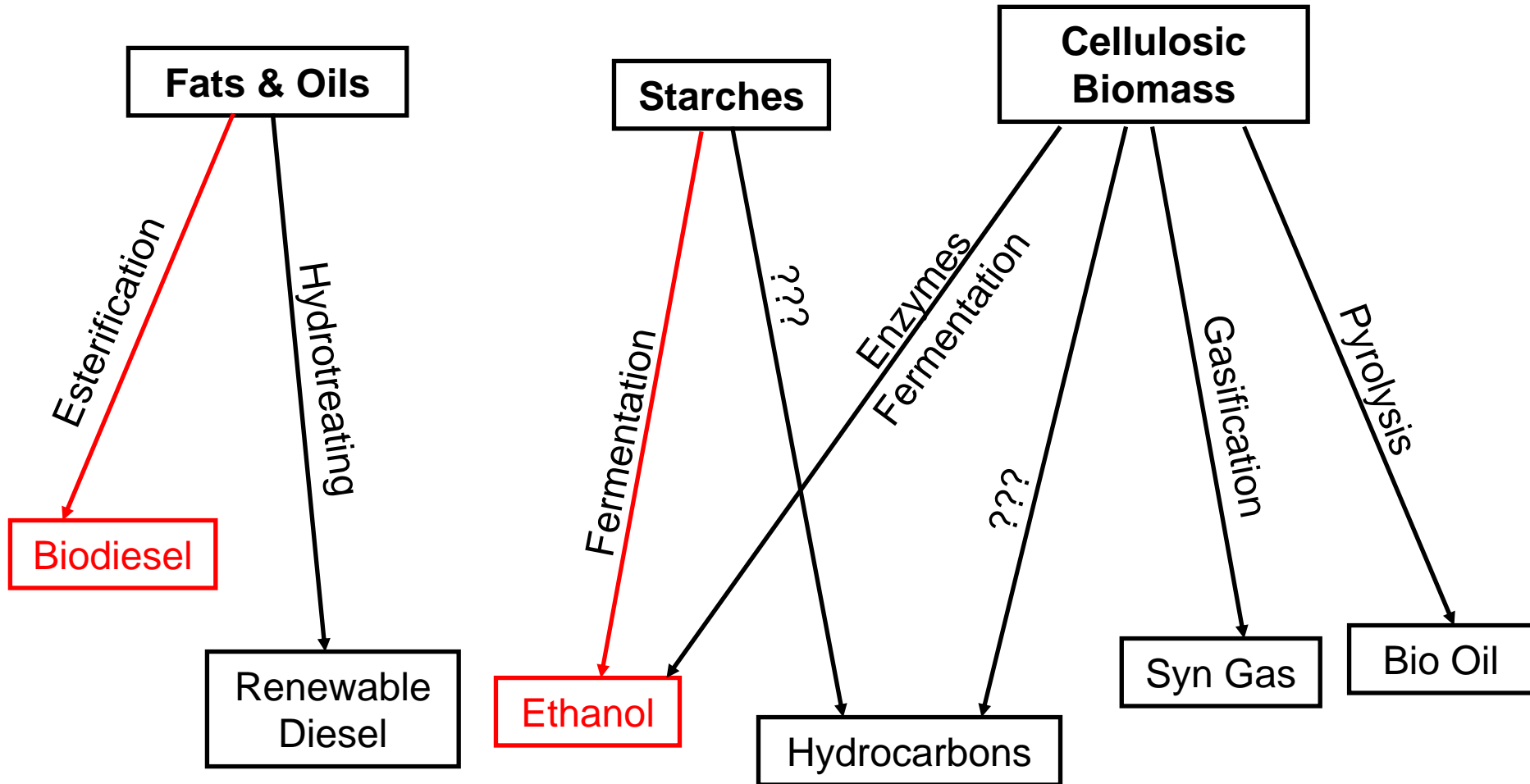
National Biofuels Policy Goals

- Energy Conservation / Security
- Agricultural / Rural Economic Support
- Climate Change / Sustainability

Second Generation Biofuels

- Large volume, low cost renewable resource
 - Ag/forest waste and oils, wood, grass, cane,
- Want flexible, efficient conversion technology
 - Makes the most of the resource
 - Should integrate with manufacturing infrastructure
 - Linked to distribution infrastructure
- Need conversion to market compatible fuel
 - Gasoline, Diesel
- Other Issues: Sustainability, Economics, Environment

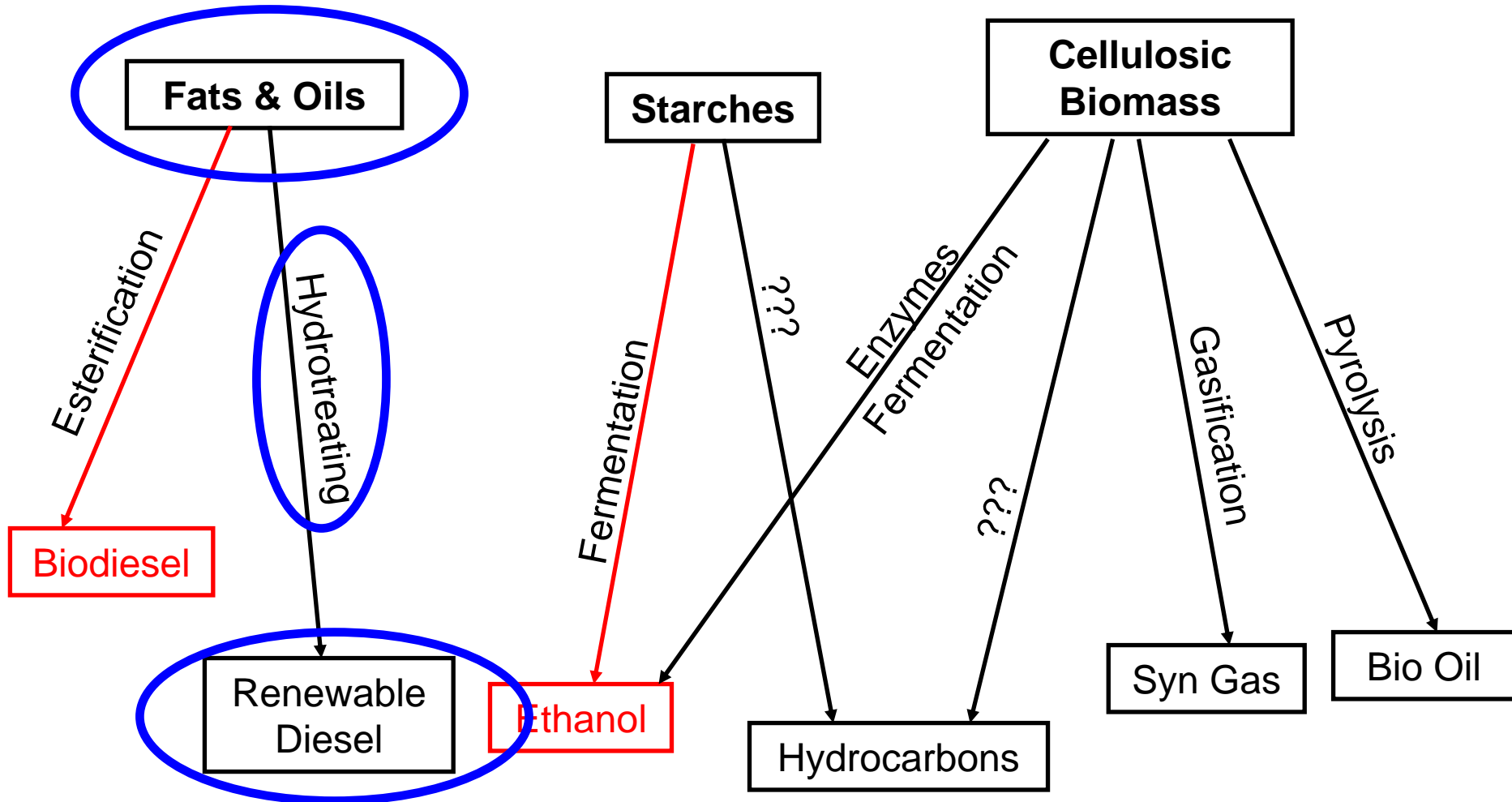
Biomass To Biofuels



First Opportunity: Renewable Diesel

- New Way to Make Diesel Fuel
- Refinery Scale and Costs
- Uses Fuel Distribution Infrastructure
- Stable Product

Biomass To Biofuels

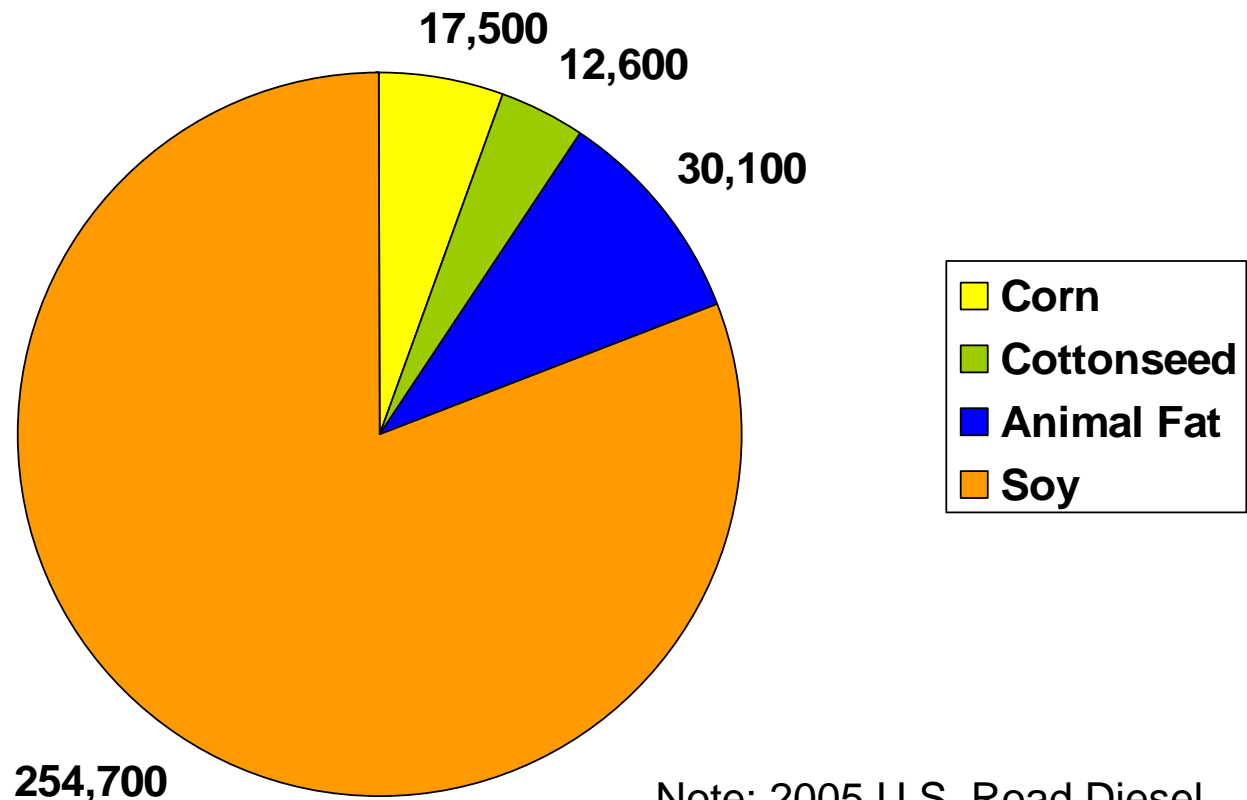


Feedstock

- Vegetable Oils, Waste Oils, & Animal Fats
 - Biodiesel works best on virgin vegetable oils
 - Renewable diesel process is insensitive to oil source (different sources have different amounts of hydrogen consumption)

2005 U.S. Fats & Oils Production

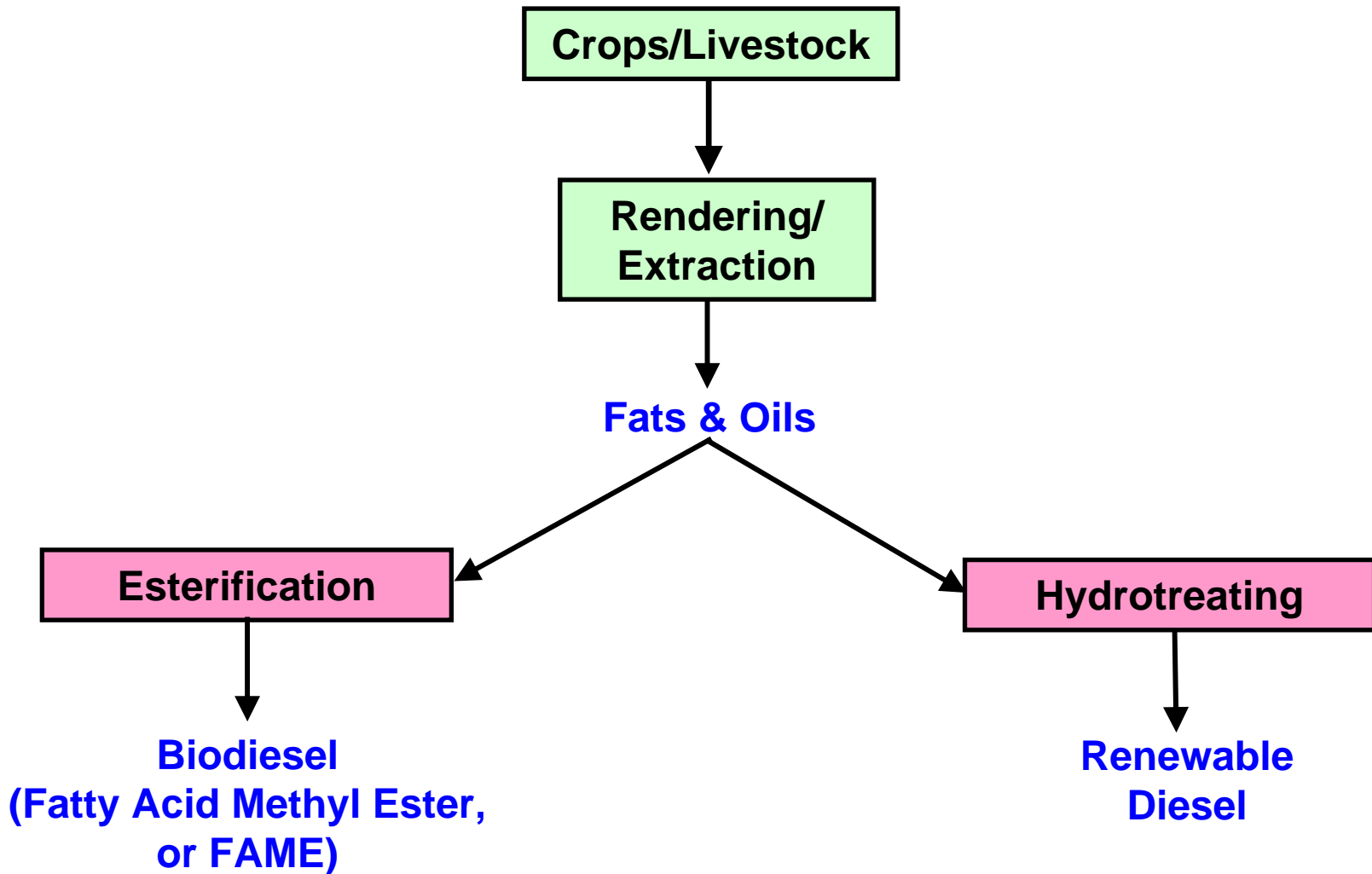
Barrels per Day (~315,000 total)



Source: 2005 US Census Data

Note: 2005 U.S. Road Diesel Demand was 2.5 Million bbl/day
Source: DOE/EIA-0535(05)

Fats & Oils Processing Options

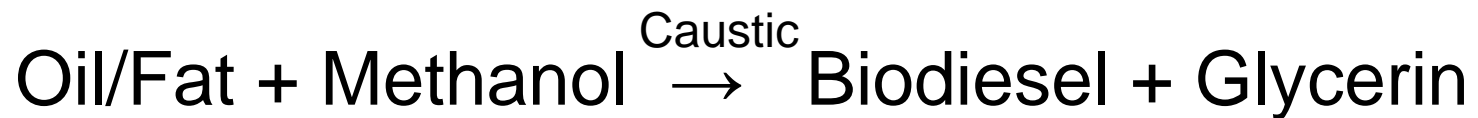


Renewable Diesel

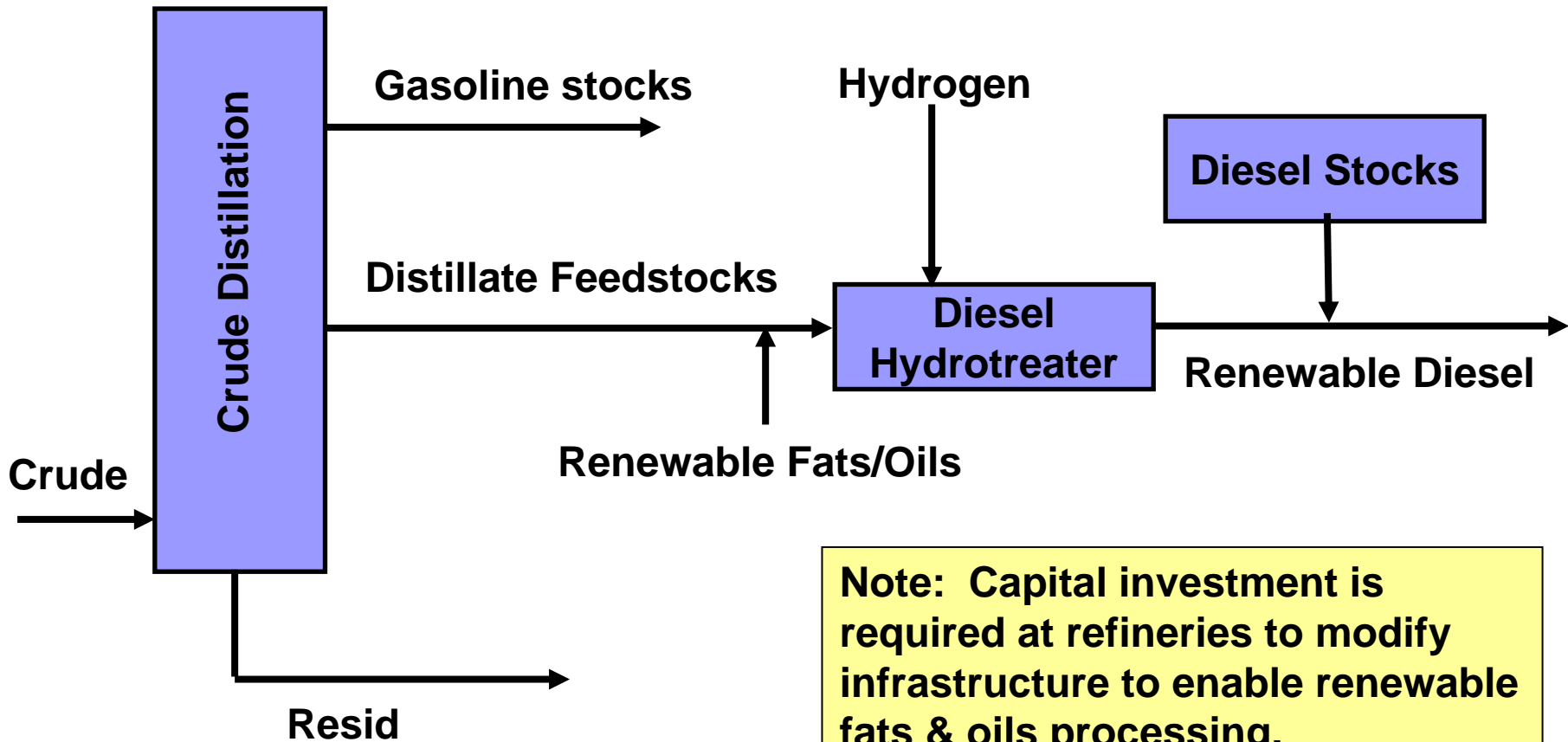
Commercial HDS catalyst



Biodiesel



Renewable Diesel Process



Note: Capital investment is required at refineries to modify infrastructure to enable renewable fats & oils processing.

Renewable Diesel Process

- Co-feed Renewable Fats/Oils to Diesel Hydrotreater
 - 150-2400 psi Hydrogen, 600-800°F
 - Normal reaction is sulfur removal (HDS)
- At HDS Conditions Fat Or Oil Conversion To Renewable Diesel Is 100%
 - C₃ backbone converted to propane (not glycerin)
 - Oxygen converted to CO₂ or H₂O

Renewable Diesel Compatibility

- High Level of Quality Control
- Meets ASTM D 975
- No New Molecules
- Can Blend Biodiesel
- No Transportation Limitations
 - Use existing pipeline & trucking infrastructure

Environmental Performance

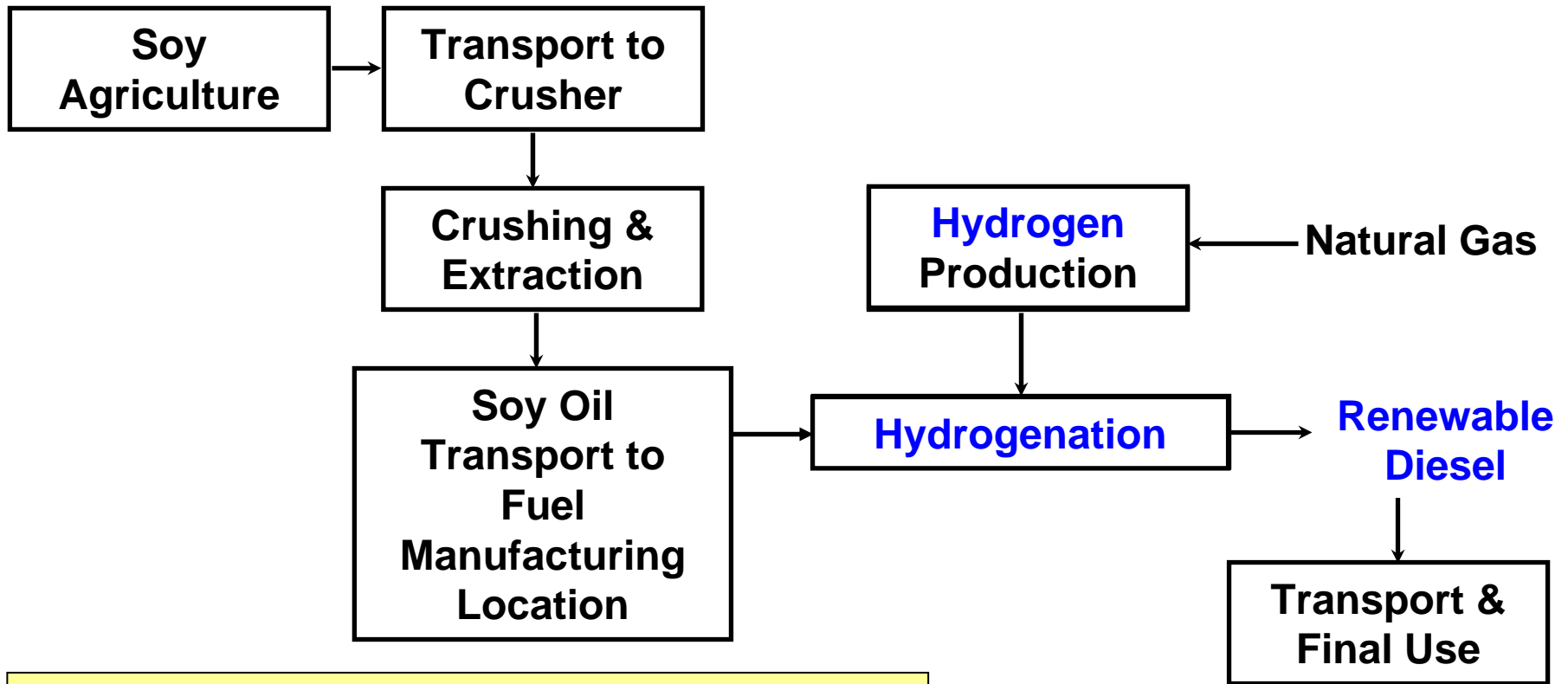
■ Criteria Pollutant Screening

- Renewable diesel blends have lower criteria pollutant emissions than ultra-low-sulfur-diesel (ULSD) for all four categories, nitrogen oxides (NO_x), hydrocarbon (HC), carbon monoxide (CO) and particulate matter (PM).
- Renewable diesel also has similar energy content to petroleum diesel and has no mileage penalty.

■ CO₂ - Life Cycle Analysis Results

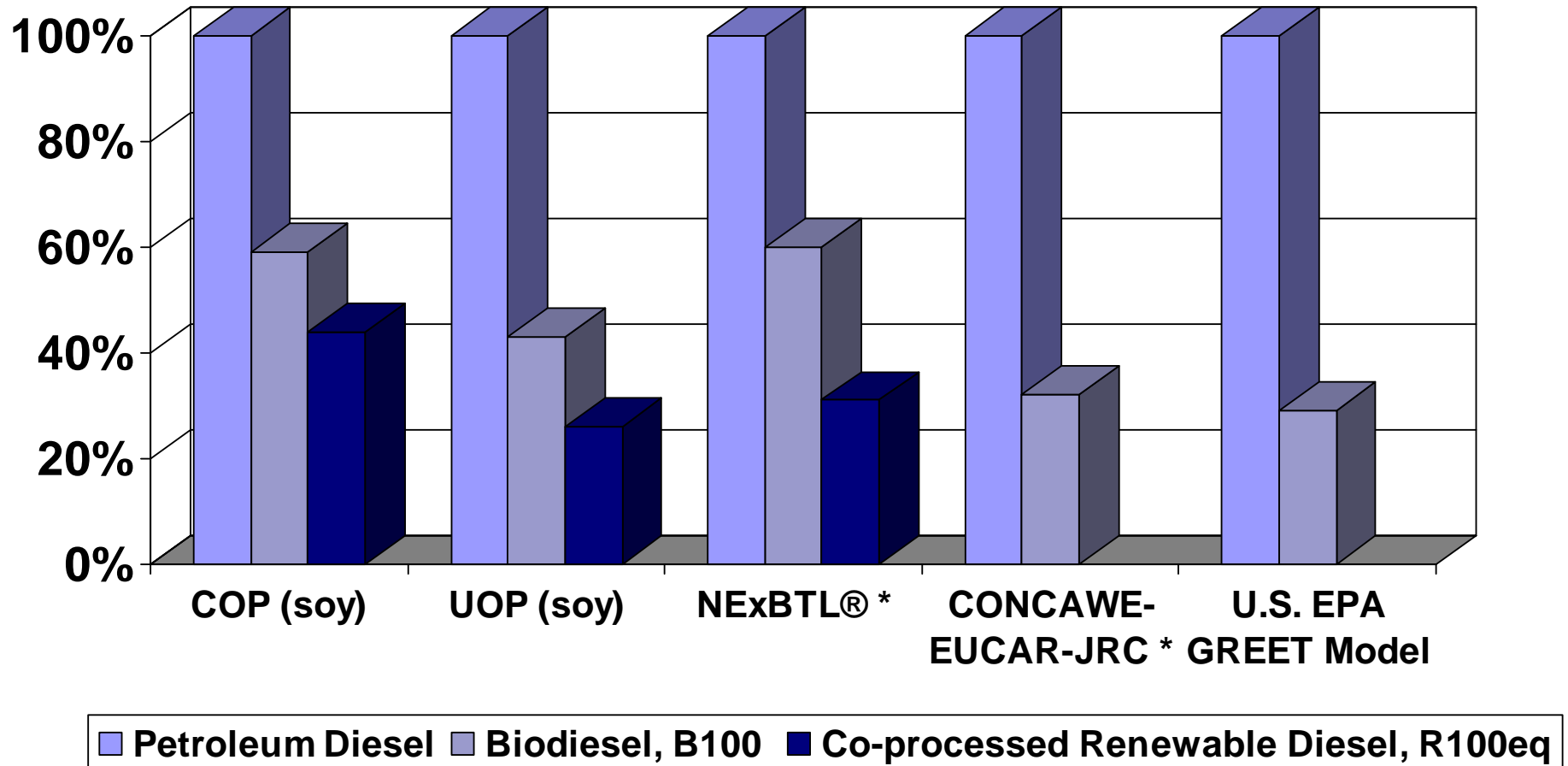
- Biomass conversion and use as a fuel has been identified as beneficial in reducing green house gases relative to conventional hydrocarbon fuels when assessed on a full life cycle basis. Life cycle analysis (LCA) shows the renewable diesel has lower CO₂ emissions than ULSD.

Bio/Renewable Diesel Lifecycle



Similar life cycle analysis can be performed for other renewable diesel feedstocks including beef tallow, canola (rapeseed), poultry fat and yellow grease.

Relative CO₂ Life Cycle Emissions



* Rapeseed Feedstock

COP Renewable Diesel Activity

- Commercial Production
 - Ireland: Diesel fuel with renewable content meeting EN 590 European diesel specification
- Tyson Partnership Announced 4-16-07
 - Up to 12,000 bbl/day from animal fat
 - Begin late 2007
- Ongoing Product & Process Testing

Renewable Diesel Summary

- Excellent Way To Incorporate Renewable Fats & Oils Into Diesel Fuel
- Feedstock Flexible
 - Converts Any Fat/Oil to Normal Diesel Fuel
- High Level Of Quality Control
- Meets ASTM D 975 Diesel Specification
- Transparent To Users
- Expands Opportunities For Farm Community

Hydrotreating Advantages

- Fuel Properties
 - Molecules already in diesel
 - Stability—no double bonds or oxygen
 - Higher cetane
- Infrastructure Compatible
 - Goes into pipeline
 - No terminal expenses
- Existing Refining Assets and Support
 - Time to implement
 - Fewer locations at quantity
 - Can splash blend biodiesel ester

Achieving Goals

- Energy Conservation / Security
Larger scale = increased adoption
- Agricultural / Rural Economic Support
Fuels size markets for agri-output
- Climate Change / Sustainability
Low carbon fuels consistent with goals

