

BIOMASS PROGRAM

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy



Biomass Program Overview
Kentucky Agricultural Summit - Bioenergy
Symposium

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The DOE's Biomass Program

The Biomass Program supports the following national priorities:



Dramatically
reduce
dependence
on foreign oil



Promote the use
of diverse,
domestic, and
sustainable
energy resources



Establish an
advanced
bioindustry
and create jobs



Reduce carbon
emissions from
energy production
and consumption

The Biomass Program forms cost-share partnerships with key stakeholders to develop, demonstrate, and deploy technologies for advanced biofuels, bioproducts, and biopower from lignocellulosic and algal biomass

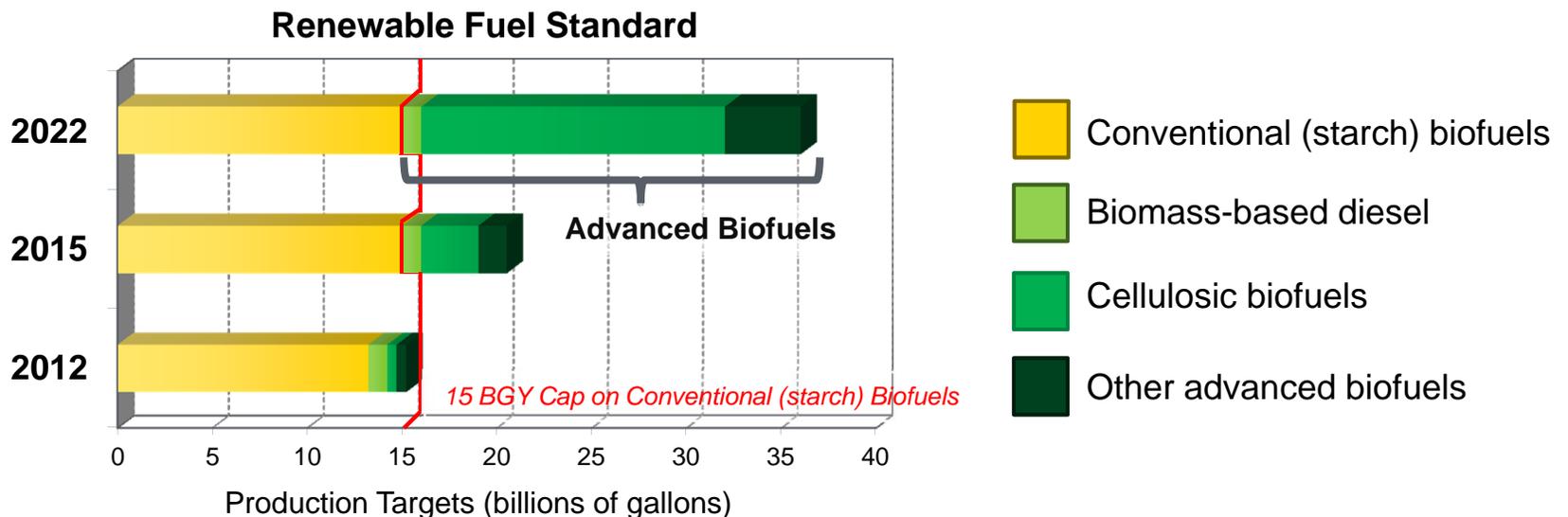
Key Policy Driver: Renewable Fuel Standard

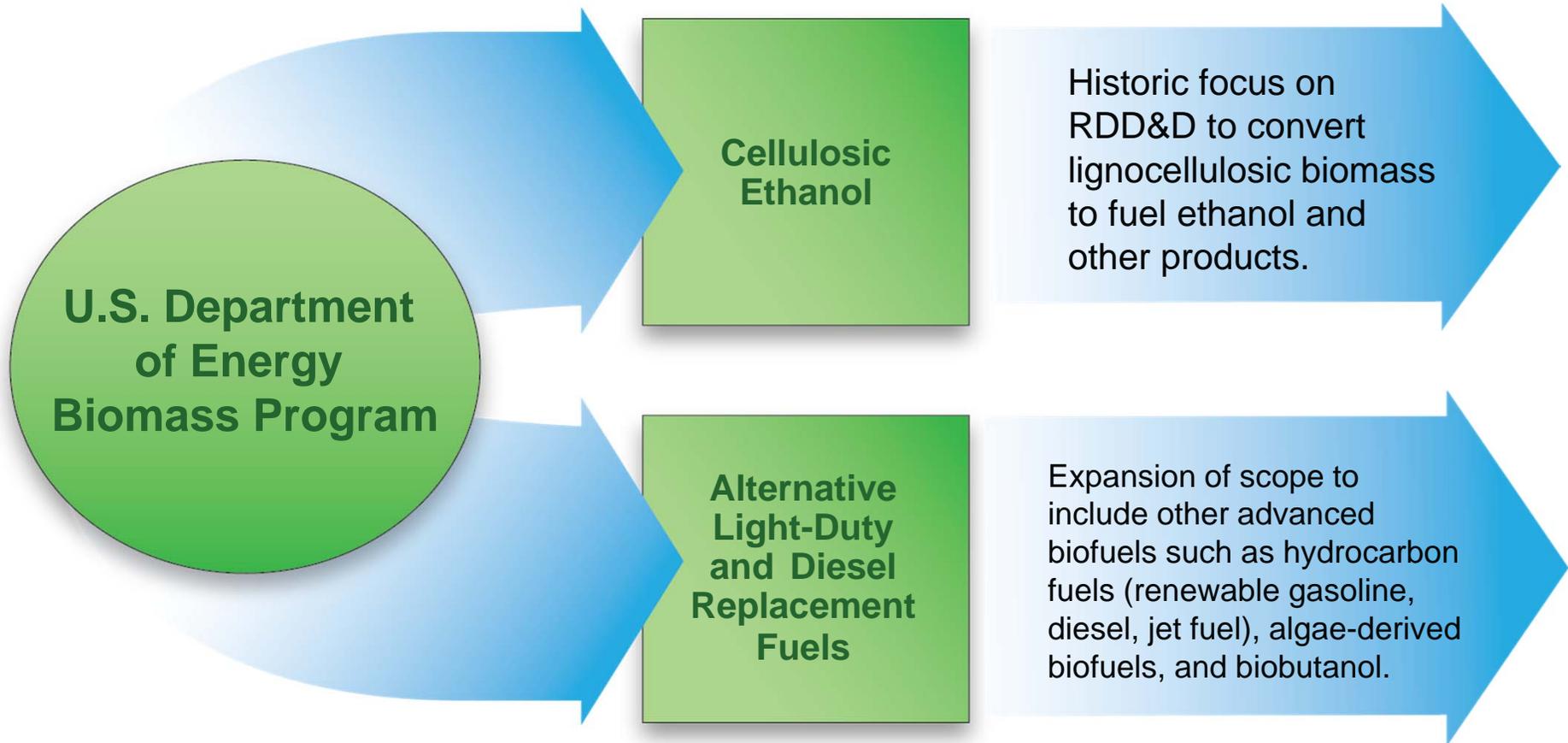
The Energy Independence and Security Act (EISA) of 2007 set aggressive goals:

- Move renewable fuels into the marketplace
- Reduce the nation's dependence on foreign sources of energy
- Reduce GHG emissions from the transportation sector

EISA established production volumes for the Renewable Fuel Standard Program (RFS), increasing the supply of renewable fuels to 36 billion gallons by 2022

The U.S. Department of Energy's (DOE) Biomass Program focuses on developing advanced biofuels to support meeting the RFS



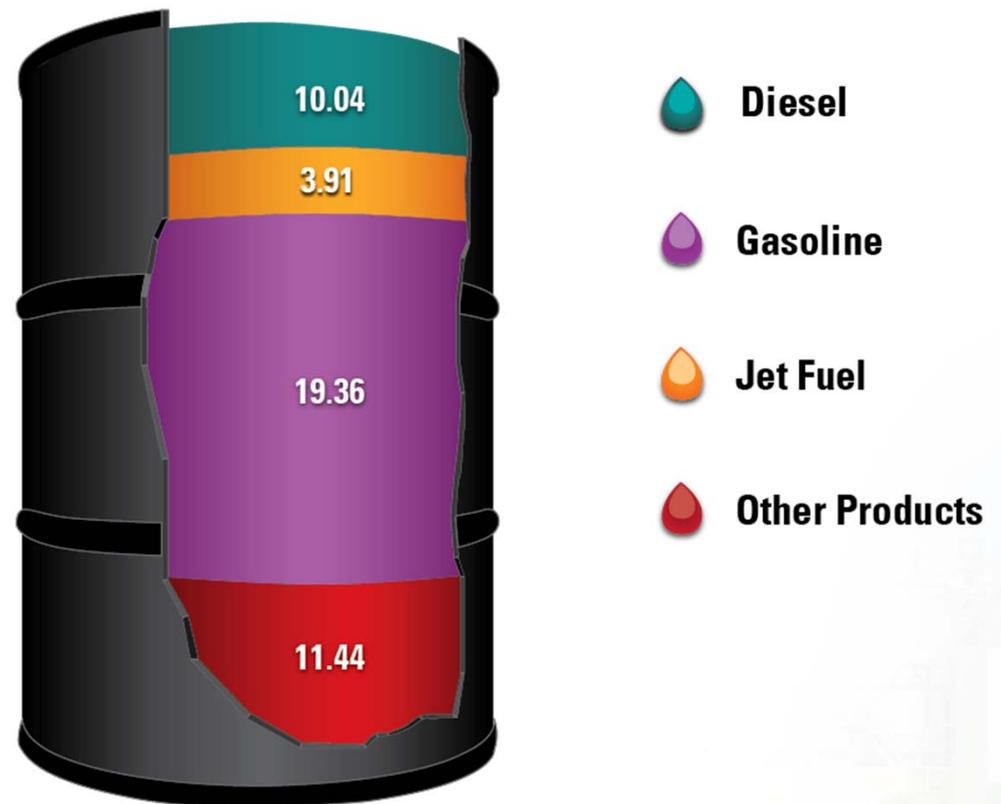


Replacing the Whole Barrel

The U.S. spends over \$300 billion/year on imported oil; that's about **\$1 billion/day**

- The U.S. transportation sector accounts for more than 70% of U.S. oil consumption
- Only about 40% of a barrel of crude oil goes toward light duty petroleum gasoline
- **Reducing dependence on oil requires developing technologies to replace gasoline, diesel, jet fuel, heavy distillates, and a range of bio-based chemicals and products.**

Products Made from a Barrel of Crude Oil (Gallons) in 2009



Source: Energy Information Administration

Biomass Program Supply Chain

The Program's portfolio is organized to reflect the biomass-to-bioenergy supply chain—from the source to the end user.



Feedstocks Supply

Develop sustainable technologies to provide a secure, reliable, and affordable biomass feedstock supply for the U.S. bioenergy industry

Conversion R&D

Develop technologies for converting feedstocks into cost-competitive liquid transportation fuels, as well as bioproducts and biopower

Integrated Biorefineries

Demonstrate and validate integrated technologies to achieve commercially acceptable performance and cost targets

Distribution, Infrastructure, and End Use

Support efforts to ensure that biofuels can safely, cost-effectively, and sustainably reach their market and be used by consumers as a replacement for petroleum fuels

Sustainable Feedstock Supply

Feedstock supply efforts focus on RD&D to develop and optimize cost-effective, integrated systems for:

- harvesting
- collecting
- storing
- preprocessing
- handling
- transporting



FEEDSTOCKS

Sustainable feedstocks, include:

- agricultural residues
- forest resources
- dedicated energy crops
- algae



ADVANCED PREPROCESSING



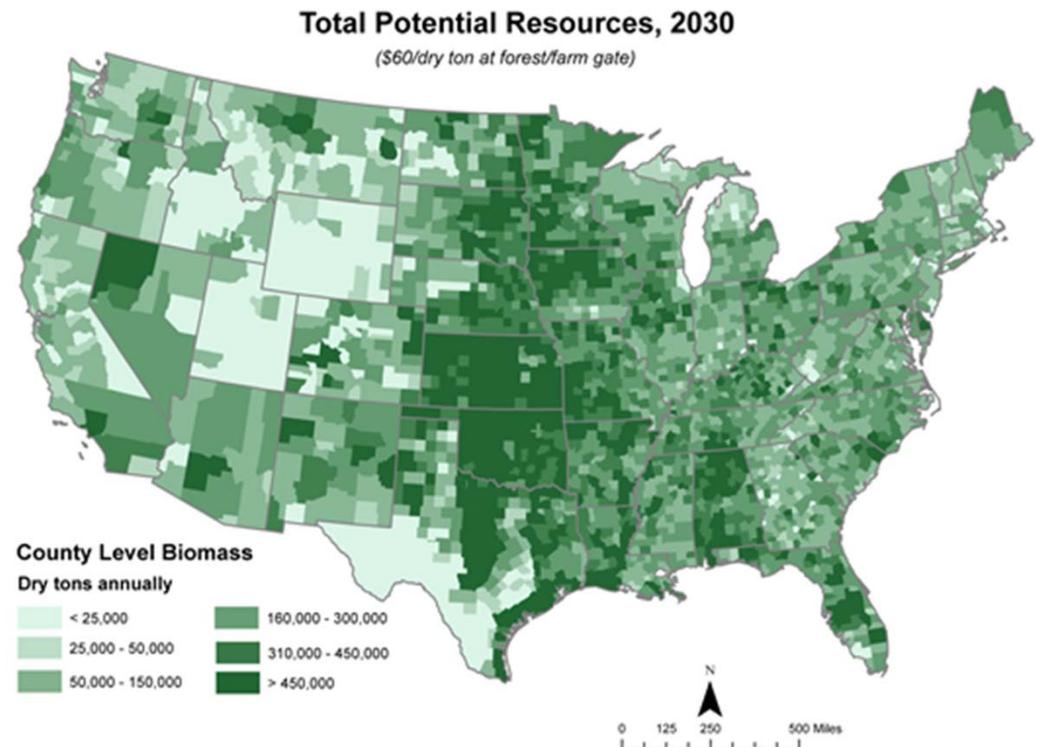
**UNIFORM FORMAT
TARGETS**

A new uniform format advanced supply system design will improve the capacity and efficiency of each feedstock logistics unit operation.

Update to the 2005 Billion Ton Study

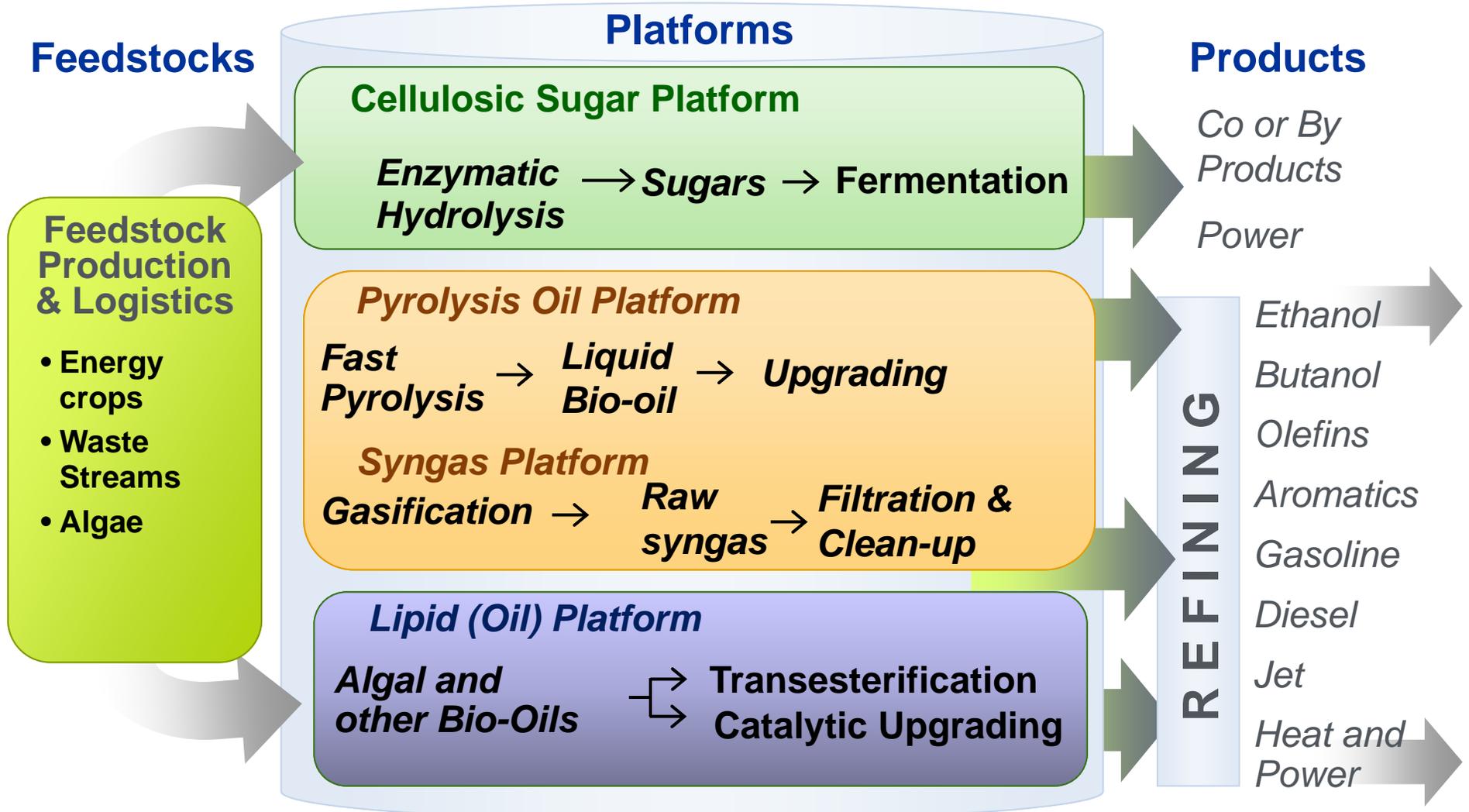
More robust analysis:

- Sustainability criteria at the field and stand level
- Updated baseline data
- Land use change modeling for energy crops
- County-level inventory and costs for all major feedstocks
- Competition with other commodities and crops



Data and analysis tools located on the Knowledge Discovery Framework:
<http://bioenergykdf.net>

Exploring Multiple Routes to Biomass



Research on multiple conversion pathways aims to improve the efficiency and economics of biofuels production.

Integrated Biorefinery Project Locations

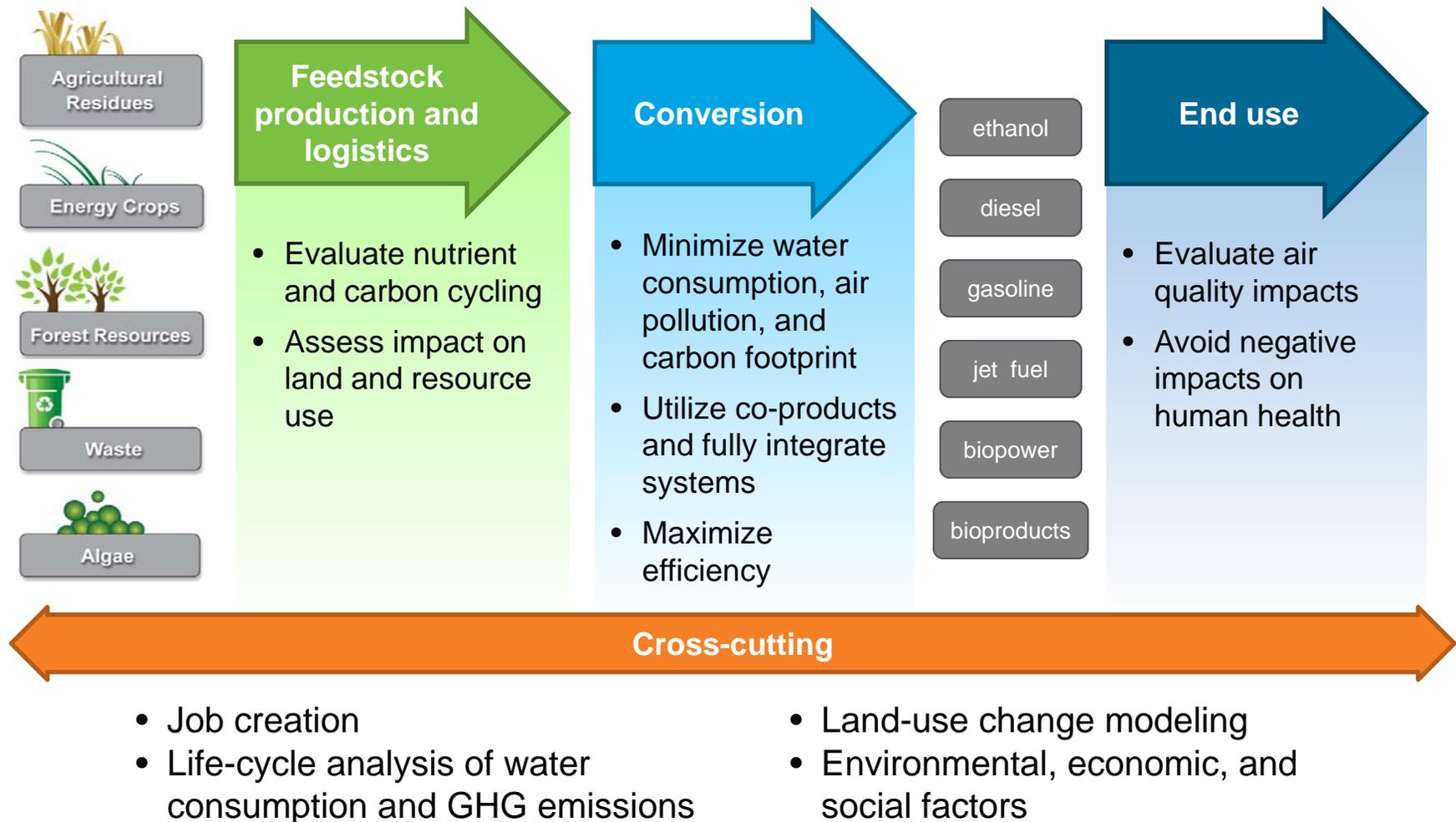
IBR PROJECTS

Approximate locations of current IBR projects at R&D, pilot, demonstration, and commercial scale



Sustainability Priorities

Developing and integrating the resources, technologies, and systems across the supply chain needed to grow a biofuels industry in a way that protects the environment



Sustainability Projects

Identifying and addressing the challenges for sustainable bioenergy production by working with research partners to conduct field trials, applied research, capacity building, and analysis.

Climate Change and Air Quality



In collaboration with NREL

Soil Health and Agronomics



In collaboration with INL

Land Use



In collaboration with multiple national labs & environmental and scientific communities

Water Quantity and Quality



In collaboration with ORNL

Biological Diversity



In collaboration with conservation International

