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BIOENERGY, CLIMATE,
AND ENVIRONMENT

FOOD PRODUCTION
AND SUSTAINABILITY

YOUTH, FAMILY,
AND COMMUNITY

FOOD SAFETY
AND NUTRITION

INTERNATIONAL
PROGRAMS

USDA NIFA

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NATIONAL INSTITUTE OF FOOD AND AGRICULTURE



Institute of Bioenergy, Climate, and Environment

- ✓ The Institute of Bioenergy, Climate, and Environment (IBCE) is one of four NIFA institutes that fund transdisciplinary, outcome-driven programs to address national science priorities.
- ✓ IBCE comprises three divisions: the Division of Bioenergy, the Division of Climate Change, and the Division of Environmental Systems.



Institute of Bioenergy, Climate, and Environment

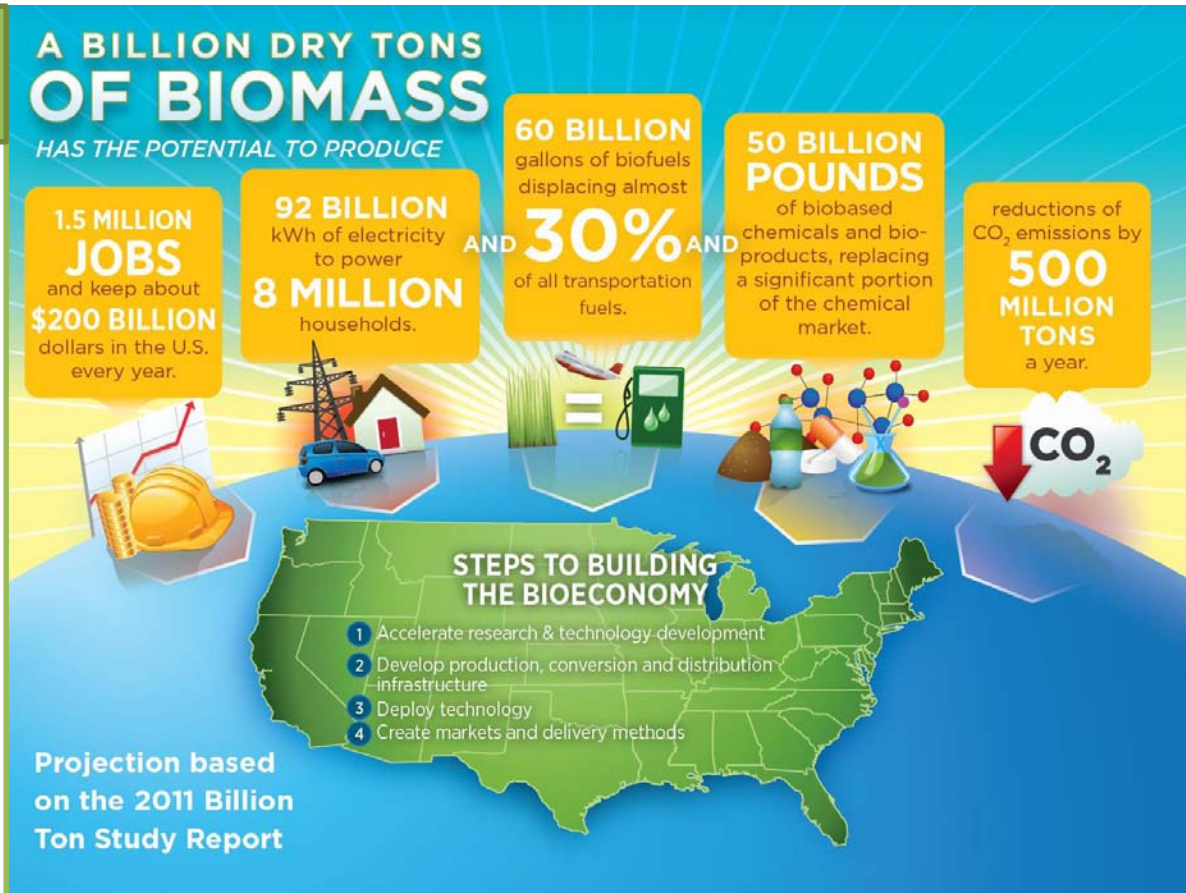
Why We Do Our Work

- Respond to Climate Variability.
- Achieve Sustainable Use of Natural Resources.
- Minimize the impact of Agriculture Practices on the Environment.
- Reduce Dependence on Foreign Petroleum.
- Create jobs in Ag based rural communities.

Growing the Bioeconomy

Increased Jobs and Economic Growth

- Bioeconomy boosts economic development in rural America, creating new jobs and providing new markets for farmers and ranchers
- Expanding the Bioeconomy can reduce our use of and conserve resources
- Follows the lead of George Washington Carver who developed 300 uses of peanuts for bioproducts
- Working with the Navy to develop bio-fuel of the future
- Developing advanced bio-chemicals in cooperation with private companies





The Bioeconomy opportunity = Jobs in Rural Communities

Operational vision - “Waste NOT - Want NOT”

Drivers:

Market opportunities

- Near term Pipeline Development

- Integrated solutions

- “Transition to” longer term sustainable higher value growth markets

Technology opportunities

- Feedstock development (production, logistics, conversion)

- New Uses (future gen high value bioproducts)

Global competitiveness

- Technology and Commercial Leadership in key segments

 - requires regional, infrastructure development

- Develop workforce talent to innovate and produce

- Support adoption efforts



New and Old Platforms Are Essential In Evolution Of Technologies For Solving Bioeconomy Challenges

EVOLUTION: AG PLATFORMS DRIVING VALUE

Genomics and Agronomics catalyze new system value:

These approaches enable multiple, complementary R&D platforms critical for Bioenergy Crops

Platforms	Inflection driver	Capability timelines
Agronomic inputs	Ag Biologicals/Designer Chemistries	2010s
Precision Farming	Digital/Sensor technology evolution	2010s
Advanced Breeding	Gene Editing	2000s
Ag Biotechnology	Genomics enablers	1990s
Germplasms gains through Breeding of Bioenergy Crops	New Crop Systems	1980s
Processing technologies for Bioenergy/bioproducts	New catalysts, enzyme and fermentation technologies	1980s

LEVERAGING ENABLERS DELIVERS TRANSFERABLE TECHNOLOGIES AND ATTRIBUTES TO BIOECONOMY



Building a sustainable Bioeconomy provides a secure path towards rural opportunities, energy independence...

Target: Healthy growing US Bioeconomy

Path: Sustainable Bioindustrials

Bioproducts/biomaterials

biofuels

Threats: Disruptive technologies
Policy shifts
Public acceptance

End game considerations:
Shift from volume drivers to value drivers
Exploit regional feedstock diversity
Identify and validate growth markets

CONCEPT



Priorities - outside of research funding

Strategic Analyses:

Disruptive technologies – stewardship responsibility

ROI – balance, weighing strategy, and innovation

Clarity of vision – biomass targets

LRP - biofuels and bioproducts

Transparent approach to targets:

Partner conversations (internal and external)

Facilitating partner conversations and networks (e.g. utilize SBIR)

Wish list:

Science and Technology pipeline balanced

Risk/Success probability

Balanced Portfolio: Short-term, Mid-term and Long-term projects

Technology advances – Integrating diverse tools and approaches...

Measure success - factors that encompass Research, Education, Extension



Working Together