



**Research, Education, and Economics  
Office of the Chief Scientist**

# **USDA Biomass R&D Activities**

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**Biomass Research & Development Board**

**Technical Advisory Committee**

**June 5, 2014**



# USDA Biomass R&D Activities

- **Foundation for Food and Agriculture Research**
- **Agricultural Act of 2014 Title IX Energy**
- **Agricultural Research Service**
- **National Institute for Food and Agriculture**
- **USDA Energy Web Portal**



# Foundation for Food and Agriculture Research

Sec. 7601 of the Agricultural Act of 2014 (P.L. 113-79) address problems of national and international importance:

- plant and animal health, production and products
- food safety, nutrition and health
- renewable energy, natural resources and the environment
- agricultural and food security
- agriculture systems and technology
- agricultural economics and rural communities



# Foundation for Food and Agriculture Research

- Independent, non-governmental, nonprofit corporation
  - 7 members from industry
  - 8 members identified by National Academy of Sciences
  - 2 or 3 yr terms initial appointment; 5 yr thereafter
- Ex-officio, non-voting, members
  - Secretary Agriculture
  - Under Sec for REE
  - Administrator ARS
  - Director NIFA
  - Director NSF

\$200 million initially which can only be used when matched at least 1:1 with non-federal funds



# **2012 Census of Agriculture Renewable Energy**

**Released May 2, 2014**

**2012 CENSUS OF  
AGRICULTURE**  
YOUR VOICE. YOUR FUTURE. YOUR RESPONSIBILITY.



# RENEWABLE ENERGY PRODUCTION

	2007 Farms	2012 Farms
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Renewable energy systems\*

23,451

57,299

Wind rights leased to others

N/A

10,181

\* Indicates significant change



# RENEWABLE ENERGY PRODUCTION 2012

	Farms
Solar Panels	36,331
Geoexchange Systems	9,403
Wind Turbines	9,054
Biodiesel	4,099
Ethanol	2,364
Small Hydro Systems	1,323
Methane Digesters	537



# TOP 10 RENEWABLE ENERGY STATES

Top States	Farms	Most common system
California	5,845	Solar panels
Texas	4,824	Solar panels
Illinois	3,046	Biodiesel
Iowa	2,463	Geoexchange systems
Indiana	2,397	Solar panels
Pennsylvania	2,234	Solar panels
Ohio	2,094	Solar panels
Colorado	2,013	Solar panels
Missouri	1,823	Solar panels
Minnesota	1,702	Geoexchange systems



# RENEWABLE ENERGY PRODUCTION, 2012

## TENURE OR PRINCIPAL OPERATOR

Production on Farm Operation	Full Owners	Part Owners	Tenants
Solar Panels	26,247	8,239	1,845
Geoexchange Systems	6,339	2,849	215
Wind Turbines	5,194	3,301	559
Biodiesel	1,740	1,904	455
Small Hydro Systems	1,021	242	60
Methane Digesters	332	182	23
Ethanol	869	1,232	263



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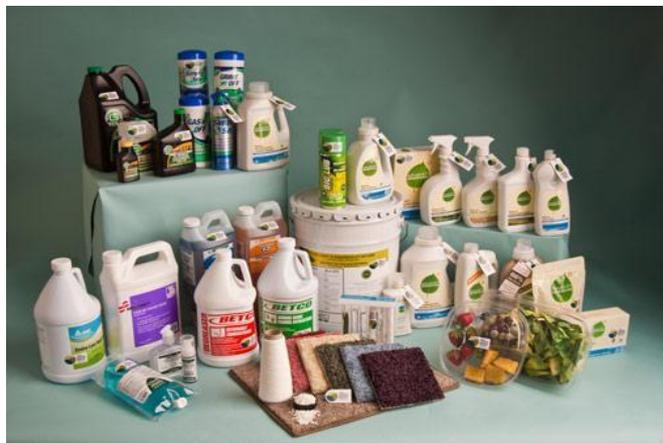
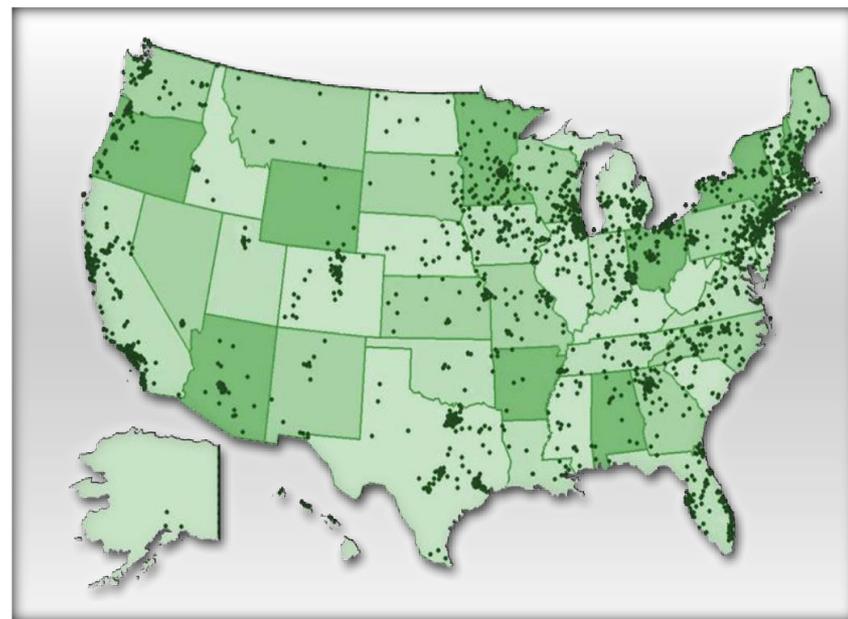
# Farm Bill Update



# Biobased Markets Program (9002)

## Commodity Credit Corporation \$3 M/yr

- Biobased products testing and labeling
  - Department committed to purchase \$1M FY14
  - Federal goal of \$10 M FY14
- Biopreferred/Biobased Labeling
- ≈ 1,000 individual products



[www.biopreferred.gov](http://www.biopreferred.gov)



# Business & Industry (B&I) Program and Biopreferred

**FY 2013 Business and  
Industry Program**

**12 projects**

**11 states**

**\$48.8 million**



## Nebraska's Laurel Biocomposites

- \$5 million loan for equipment and working capital
- convert distillers grain into a biobased resins
- Bioplastic pellets used in the shipping, lawn and garden, agriculture, and automotive industries



# B&I and BioPreferred Program Mix

- Laurel Biocomposites obtained USDA BioPreferred Program certification for bio-resin in 2013; 62% biobased content
- **'Biobased'** -- amount of new carbon vs. total organic carbon in product





# Biorefinery, Renewable Chemical, and Biobased Product Manufacturing

## Rural Development Agency (9003) BAP

- Loan guarantees for first-of-a-kind, commercial-scale projects
- Includes renewable chemical & biobased product
- Loans for manufacturing (up to 15%)
- \$100MFY14, \$50M in each FY15,16



*Concentrated algae, ready for extraction  
at Sapphire Energy, Columbus, New  
Mexico. (photo credit: Sapphire Energy)*



*INEOS New Planet BioEnergy facility, Vero  
Beach, Florida (photo credit: INEOS Bio)*



*Fully operational community digester,  
Fremont, Michigan (USDA photo)*

June 5, 2014

BR&D TAC



# Biorefinery, Renewable Chemical, and Biobased Product Manufacturing

## 2008 Farm Bill Funds BAP (9003)

- Closed Jan 30, 2014 - 8 applications
- \$510 M loan guarantee requested
- \$160 to \$190 M available
- TX, LA, GA, NC
- 5 Technologies
  - Green gasoline, diesel, and advanced aviation from woody biomass
  - Cellulosic ethanol from algae
  - 2 Anaerobic digesters swine slurry
  - Solid fuel pellets from woody biomass
  - 2 Biodiesel from waste greases and oils



# Rural Development Agency

- **Repowering Assistance Program (9004)**  
\$12 M until expended
  - payments to eligible biorefineries to replace fossil fuels used to produce heat or power to operate the biorefineries with renewable biomass
- **Bioenergy Program for Advanced Biofuels (9005)**  
\$15 M / yr
  - support and expand production of advanced biofuels refined from sources other than corn kernel starch.



# Rural Energy for America Program (REAP) Rural Development (9007)

Loan guarantees and grants to agricultural producers and rural small businesses to purchase and install renewable energy systems and to make energy-efficiency improvements

- \$12.38 million in grant funds
- \$57.8 million in loan guarantee
- Deadline for grants and grant/loan guarantee combinations is July 7, 2014.
- Deadline for loan guarantees is July 31, 2014.



# Biodiesel Fuel Education program (9006) NIFA

Educational programs which support advances in infrastructure, technology transfer, fuel quality, fuel safety and increasing feedstock production.

- Funds available \$960,000
- Closing June 27, 2014



# Biomass Crop Assistance Program Farm Service Agency (9010)

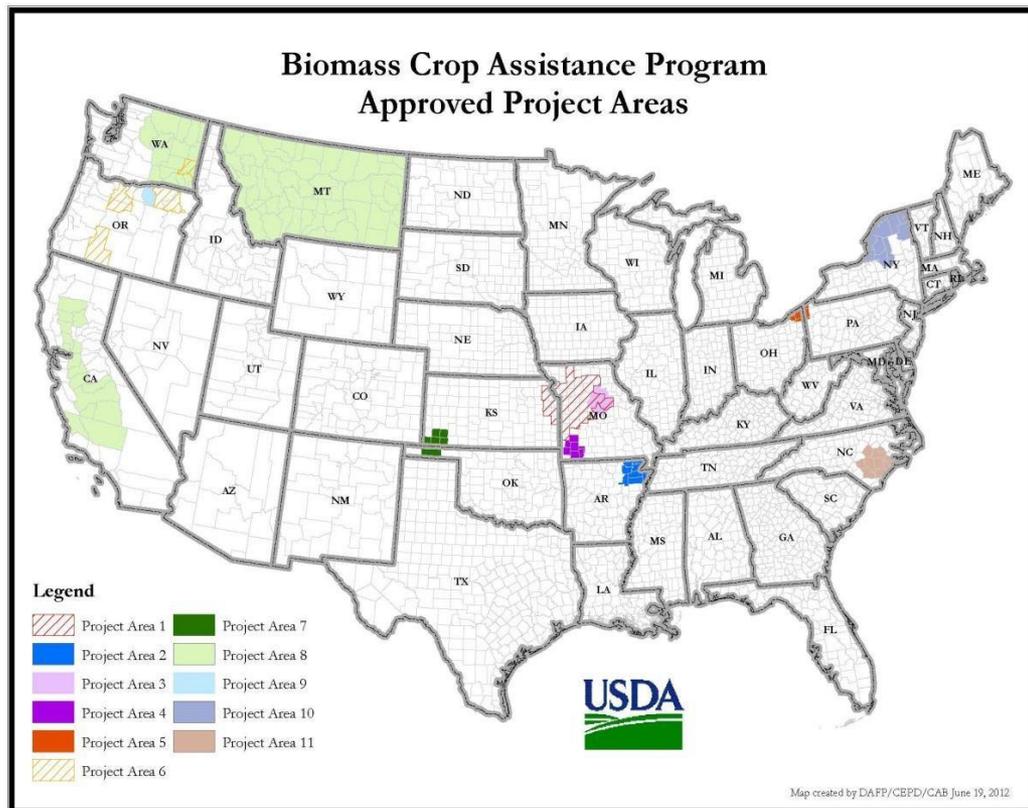
- Provides financial assistance to establish, grow and deliver biomass for energy or bio-based products
- Establishment and annual payments
  - capped rate for perennial crops at \$500 per acre (\$750 for SSD)
- CHST program matching payments for collection, harvest, storage, and transportation of eligible material for use in a qualified biomass conversion facility
  - \$1 for each \$1 per ton, up to \$20 per ton
  - not less than 10%, not more than 50% per year
  - Funding available beginning June 9<sup>th</sup>

\$25 million annually 2014 -2018



# Biomass Crop Assistance Program

- More than 50,000 acres
- over 1,000 producers estimate
- 7 varieties of dedicated energy crops including:
  - ✓ fast growing trees
  - ✓ energy grasses
  - ✓ oilseeds
- 11 Project Areas





# Natural Resources and Environment

## U.S. Forest Service

### *Wood to Energy Initiative Grants (9012)*

- Wood to Energy (W2E) for wood energy projects that require engineering services final design and cost analysis. Some or all of the woody biomass must come from National Forest Service System lands. Deadline 6/3/2014.



# Natural Resources and Environment

## U.S. Forest Service

### *Wood to Energy Initiative Grants*

#### ➤ Statewide Wood Energy Team Cooperative Agreements

support collaborative statewide wood energy teams that advance the installation of commercially viable wood energy systems in the public and private sectors that use woody biomass generated from National Forest System lands and other land ownerships. Deadline May 20, 2014

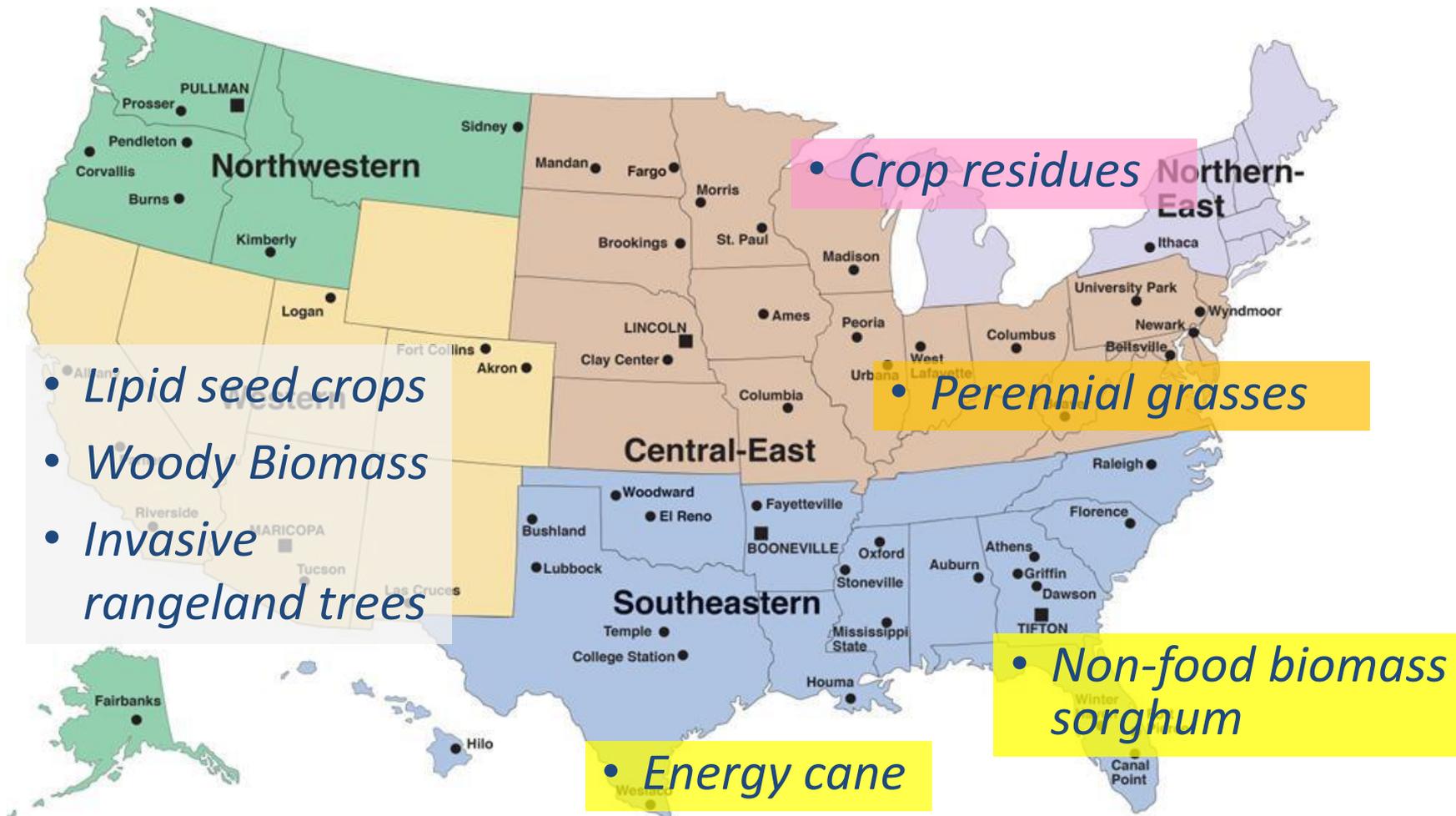


# USDA Research Efforts

- Research
  - Physical and social sciences
  - 5 Biomass Research Centers (ARS and FS Leadership)
    - Regional biomass focus
    - Integrate energy biomass crops into food and forestry production systems
    - Increase productivity and improve quality
  - National Institute of Food and Agriculture (NIFA)
    - Agricultural Food and Research Initiative (AFRI) – Coordinated Agriculture Projects (CAPS)
    - Biomass Research and Development Initiative

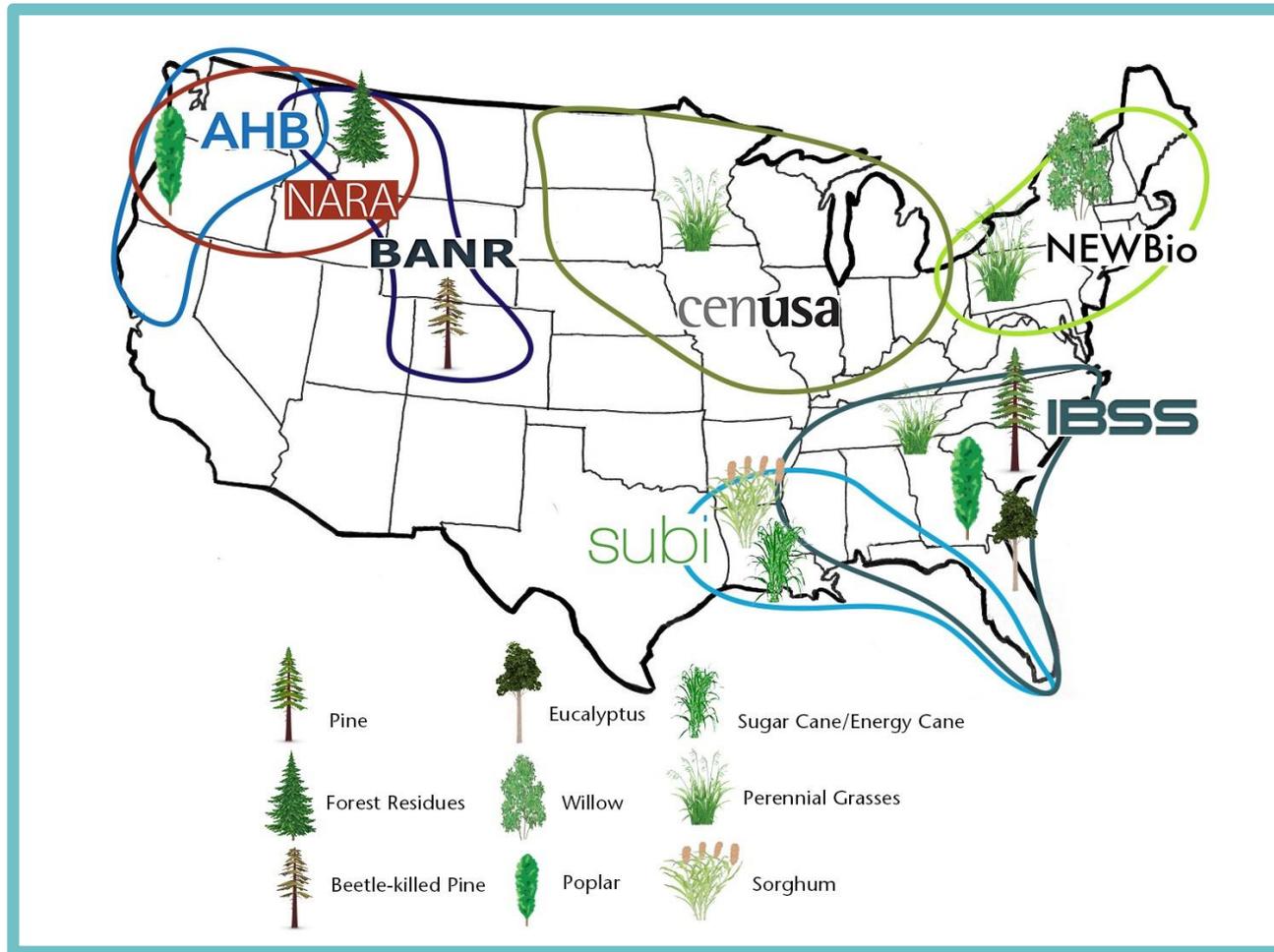


# ARS Regional Biomass Centers





# AFRI Biofuel Projects





# USDA Partnerships

- DOE, EPA, FAA, DOT, DOD, Navy
- Defense Production Act
- Farm to Fleet Program
- Interagency Working Group on Alternative Fuels
- Interagency Feedstock Working Group
- Public-private partnerships
- Farm to Fly Initiative
- CAAFI – Commercial Aviation Alternative Fuels Initiative
- Dairy Innovation Center



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**THANK YOU**



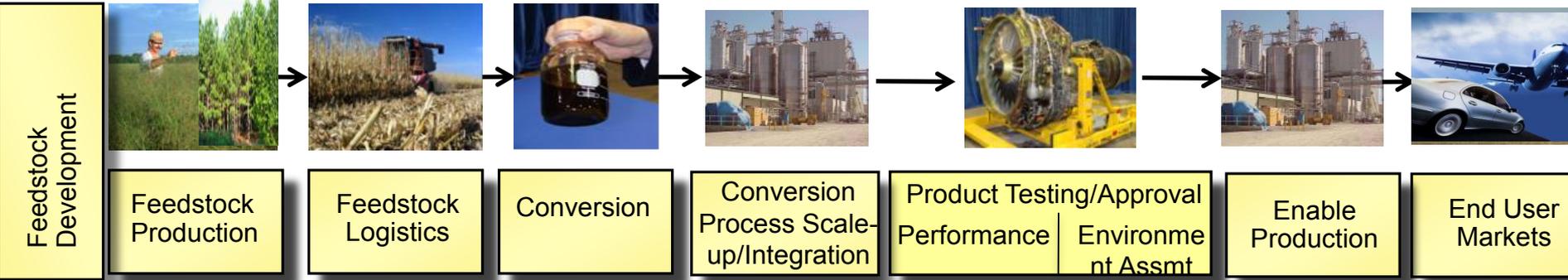
## **National Institute of Food and Agriculture Sustainable Bioenergy**

- Facilitate system-based approaches for development of sustainable supply chains for the production of biofuels, biopower, and bioproducts.
- \$150 M NIFA current five year investment in renewable regional supply chains.
  - Agriculture and Food Research Initiative: \$122 M (5 projects)
  - Biomass Research and Development Initiative: \$20 M (3 projects)
  - Non-competitive: ~\$6 M



# USDA Supply Chain Approach

[www.usda.gov/energy](http://www.usda.gov/energy)



**Feedstock Development & Production**

**Feedstock pathways – Integration - Scale Up Commercial Production**

**Efficiency Improvements  
Biofuels  
Heat and Power  
Biobased Products**

**Research and Education**

**Programs: Technical and Financial Assistance**

**Outreach**