



National Institute of Food and Agriculture
www.nifa.usda.gov

Biomass Research and Development Initiative (BRDI)

Briefing for Biomass R&D TAC

November 8, 2011

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Biomass Research and Development Initiative

OVERVIEW

- BRDI Update
- TAC Recommendations
- USDA/DOE Collaboration
- NIFA Review Process
- Post Award Management
 - Data management
 - Site visits



Biomass Research and Development Initiative FY 2011/2012

- Focus on advanced biofuels
- Interest in small scale processing
- Interest in rural-based processing and manufacturing
- Interest in biobased industrial products
- Funding range \$3M - \$7M
- Required integration of:
 - feedstock development/production, feedstock logistics,
 - feedstock conversion, product development
 - system analysis, e.g. life cycle analysis, impacts on food/feed supply



Biomass Research and Development Initiative FY 2011

- **USDA contribution - FY 2011 \$30 M, FY 2012 \$40 M**
- **DOE contribution - FY 2011 \$5M, FY 2012 \$?**
- **DOE Office of Biomass and Golden Field Office administer pre-application process**
- **Approximately 248 pre-applications reviewed for 2011**
- **51 pre-applications invited**
- **USDA-NIFA administers the invited full application process**
- **Awards anticipated in February/March 2012**
- **FY 2012 solicitation announced March 2012**



Biomass Research and Development Initiative

- **FY 2009 required Technical Area (C) Analysis**
- **FY 2010 required integration of all three technical areas; funding range \$3M-\$7M**
- **FY 2011 continues with integrated, comprehensive approach**



Biomass Research and Development Initiative

How is BRDI responsive to TAC recommendations?

- Topics of interest expanded beyond alcohol fuels
- Topics of interest include biofuels, biopower and bioproducts
- Integration of feedstocks and conversion technologies
- Include animal manure as a feedstock of interest for biopower (gasification)
- Attention to woody biomass (combined heat and power)
- Attention to quantifying environmental, economic and social impacts (life cycle perspective)



Biomass Research and Development Initiative

How do USDA and DOE collaborate?

- Jointly prepare the annual solicitation
- Draft moves concurrently through USDA and DOE approval process and Biomass R&D Board is briefed
- Mutually agree on the Evaluation and Selection Plan
- Jointly select reviewers
- NIFA staff participate in the pre-application review
- Mutually agree on the Chairpersons' Report
- DOE representative attends full application review
- Jointly discuss final ranking and recommendations for awards



Biomass Research and Development Initiative

NIFA Full Application Review Process

- 4 reviewers/application
- 30 days for reviewers to enter comments and scores into electronic Peer Review System (scores are not numeric)
- Reviewers convene in Washington DC to discuss each application and come to consensus on ranking
- Top ranked applications recommended for funding



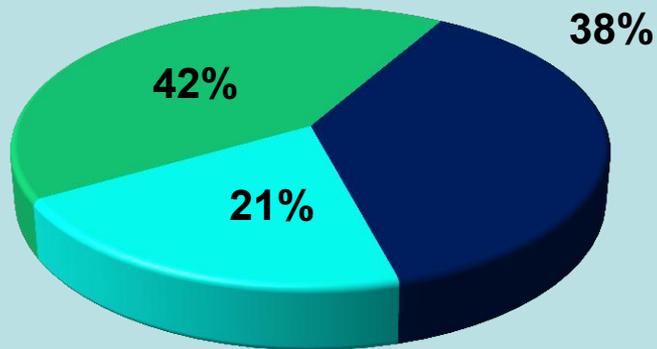
Biomass Research and Development Initiative

- Reviewers selected from expertise databases maintained by DOE and by NIFA
- Conflicts of interest are identified by NIFA staff in advance of assignments of full applications
- Conflict of Interest and Confidentiality Statements are part of the Peer Review System



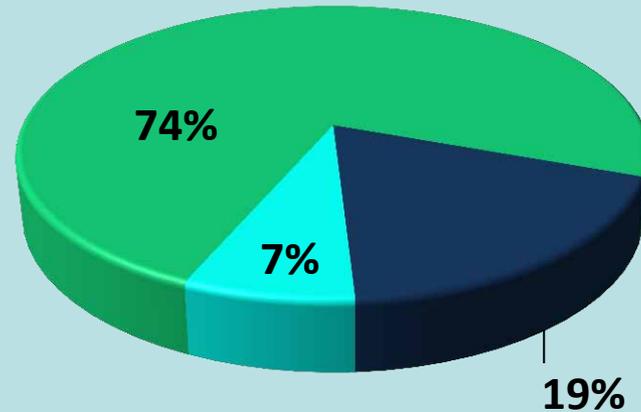
2010 BRDI Review Panel Composition

2010 Pre-Application Merit Review Panel Composition



- Industry/Small Business
- Government
- Academia

2010 Full Application Peer Review Panel Composition

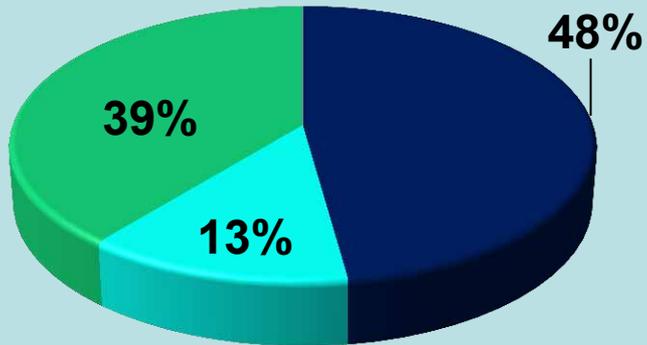


- Industry/Small Business
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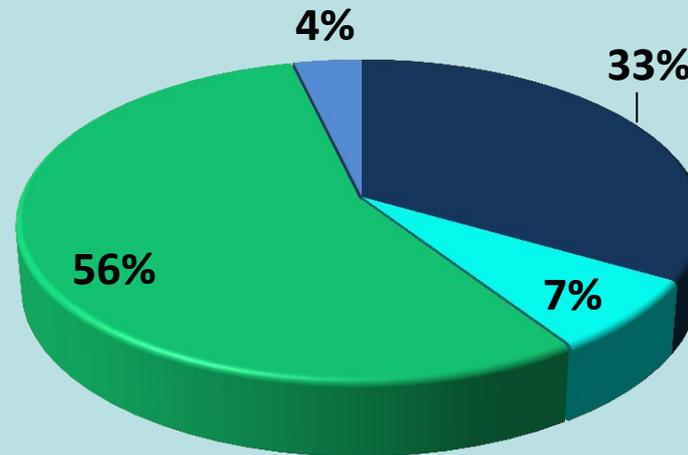
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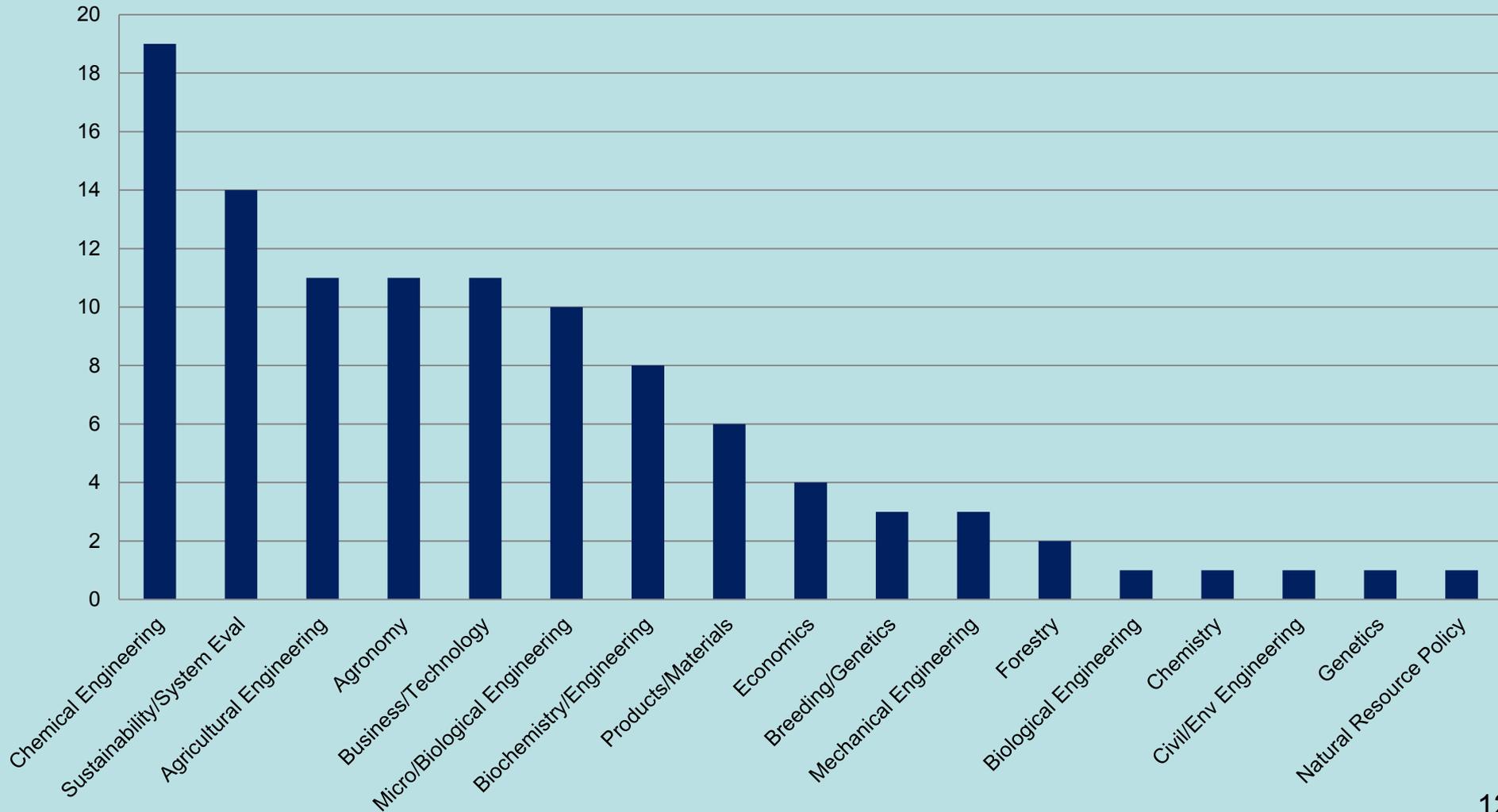
2011 Full Application Peer Review Panel Composition



- Industry/Small Business
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BRDI Panelist Expertise 2010-2011





BRDI Post-Award Management

- National Agricultural Library is developing a life cycle inventory
 - Repository for data collected by projects
 - Develop unit process data sets representing US field crop production to serve as initial LCA data in the *Digital Commons Database* which will be expanded to include industrial operations at all stages of the life cycle of the product
 - Data will be publically available



BRDI Post Award Management

- How can we quantify sustainability?
- What data should be collected?
- Global Bioenergy Partnership (GBEP)
<http://www.globalbioenergy.org/>
- Criteria and indicators from international perspective that take into account developing countries
- BRDI will be a test case for the GBEP framework

Annex: The GBEP sustainability indicators for bioenergy

In the below table, the set of twenty-four GBEP sustainability indicators for bioenergy, are set out under the three pillars, with the relevant themes listed at the top of each pillar.

PILLARS		
GBEP's work on sustainability indicators was developed under the following three pillars, noting interlinkages between them:		
Environmental	Social	Economic
THEMES		
GBEP considers the following themes relevant, and these guided the development of indicators under this pillar:		
Greenhouse gas emissions, Productive capacity of the land and ecosystems, Air quality, Water availability, use efficiency and quality, Biological diversity, Land-use change, including indirect effects.	Price and supply of a national food basket, Access to land, water and other natural resources, Labour conditions, Rural and social development, Access to energy, Human health and safety.	Resource availability and use efficiencies in bioenergy production, conversion, distribution and end-use, Economic development, Economic viability and competitiveness of bioenergy, Access to technology and technological capabilities, Energy security/Diversification of sources and supply, Energy security/Infrastructure and logistics for distribution and use.
INDICATORS		
1. Life-cycle GHG emissions	9. Allocation and tenure of land for new bioenergy production	17. Productivity
2. Soil quality	10. Price and supply of a national food basket	18. Net energy balance
3. Harvest levels of wood resources	11. Change in income	19. Gross value added
4. Emissions of non-GHG air pollutants, including air toxics	12. Jobs in the bioenergy sector	20. Change in consumption of fossil fuels and traditional use of biomass
5. Water use and efficiency	13. Change in unpaid time spent by women and children collecting biomass	21. Training and re-qualification of the workforce
6. Water quality	14. Bioenergy used to expand access to modern energy services	22. Energy diversity
7. Biological diversity in the landscape	15. Change in mortality and burden of disease attributable to indoor smoke	23. Infrastructure and logistics for distribution of bioenergy
8. Land use and land-use change related to bioenergy feedstock production	16. Incidence of occupational injury, illness and fatalities	24. Capacity and flexibility of use of bioenergy



BRDI Post Award Management

- **USDA-funded projects FY 2005 – 2007**
- **20 projects closing out**
- **2-3 subject matter experts, primarily from academia, also USDA-ARS, NSF**
- **Standardized reporting to the Research Progress Performance Report (RPPR)**
- **Reports will serve as mechanism for information and technology transfer**
- **Reports will provide information for the Secretaries' annual report to Congress**



Biomass Research and Development Initiative Concurrent Activities

- **FY 2011 full applications due November 22, 2011**
- **Data management strategy under development**
- **Site visits underway**
- **Review panel will convene January 17-19**
- **Awards anticipated February/March**
- **FY 2012 solicitation announced in March**



Biomass Research and Development Initiative

FY 2009 Awards

(A) Feedstock Development

- Sustainable Feedstock Supply Systems (OK State Univ.)
- Conditionally Activated Proenzymes (Agrivida)

(B) Biofuels and Biobased Products

- Food and Yard Waste into Biogas and Bioproducts (Yenkin-Majestic Paint Corp.)
- Cellulosic Isobutanol Fermentation Biocatalyst (Gevo, Inc.)
- Kinetic Models of Biomass Gasification (GE Global Research)
- Production of Polyitaconic Acid from Northeast Hardwood Biomass (Itaconix, LLC)
- Improving Biorefinery Economics through Microchannel Hydroprocessing (Velocys, Inc.)



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FY 2009 (continued)

(C) Biofuels Development Analysis

- **Environmental Sustainability and Capacity of Forest-based Biofuel (University of Minnesota)**
- **Analysis of the Global Impacts of Second Generation Biofuels (Purdue University)**



Biomass Research and Development Initiative FY 2010

- **Integrated Biorefinery at the Domtar Plymouth, North Carolina Paper Mill (Domtar)**
- **Developing a New Generation of Animal Feed Protein Supplements: Co-Products from Marine Algae Biofuel Production (Cellana)**
- **Technology to Enable Local Production of Biofuels from Energy Crops – (Exelus)**
- **Integration of Biofuels and Bioproducts Production into Forest Products Supply Chains Using Modular Biomass Gasification and Carbon Activation (US Forest Service)**
- **Green Technologies for Product Diversification in an Integrated Biorefinery (University of Kansas)**



Biomass Research and Development Initiative FY 2010

- **On-Farm Biomass Processing: Towards an Integrated High Solids Transporting/Storing/Processing System (University of Kentucky)**
- **Next-Generation Sweet Sorghums – Sustainable Production of Feedstocks for Fuels, Chemicals and Value-Added Products (University of Florida)**
- **Renewable Enhanced Feedstocks for Advanced Biofuels and Bioproducts Development Program (Metabolix)**