



**Biomass R&D Technical Advisory
Committee
August 14-15, 2013**

Elliott Levine
DOE Updates

Welcome to New Members

- New Co-Chair: Dr. Kevin Kephart, Vice President for Research, South Dakota State University
- Dr. Paul Bryan, Lecturer, Department of Chemical and Biomolecular Engineering, University of California, Berkeley
- Steve Csonka, Executive Director, Commercial Aviation Alternative Fuels Initiative, DBA Csonka Aviation Consultancy, LLC
- Claus Crone Fuglsang, Vice President, Bioenergy R&D, Novozymes North America, Inc.
- Dr. Man Kit Lau, Senior Scientist, BioAmber, Inc.
- Dr. Johannes Lehmann, Distinguished Professor, Dept. of Crops and Soil Sciences, Cornell University
- Christine McKiernan, Vice President of Engineering, BIOFerm Energy Systems
- Dr. Ray Miller, Director and Professor, Forest Biomass Innovation Center, Michigan State University
- Dr. Don Stevens, President, Cascade Science and Technology Research

TAC Housekeeping

Travel Process

- Natalie Roberts is the point of contact for all questions related to TAC travel and reimbursement. She can be reached at natalie.roberts@ee.doe.gov or 202-586-2325.
- Reimbursement deadline for the August meeting: **September 15th**

Future Meeting Dates

- Tentative date for week of Q4 meeting has been identified below and will be confirmed during the meeting:
 - Q4: Week of November 18-22, 2013

Q3 Binder Elements

Contents

1. Biomass R&D Technical Advisory Committee Meeting Agenda
2. Biomass R&D Act (as amended)
3. Biomass R&D Technical Advisory Committee Charter
4. Biomass R&D Technical Advisory Committee Members and Subcommittee Assignments
5. Biomass R&D Board Members and Operations Committee Members
6. Speaker Bios
7. 2013 TAC Grand Challenge Themes
8. 2013 TAC Meeting Dates
9. DOE and USDA Biomass Updates

Agenda at a Glance - Day 1

Wednesday, August 14th

Introduction and Welcome

- 8:00 am – 8:30 am: Breakfast (*to be provided for Committee*)
- 8:30 am – 8:40 am: Introduction and Welcome to New Members – *Co-Chairs*

DOE/USDA Updates

- 8:40 am – 9:00 am: DOE Updates – *Elliott Levine (DOE)*
- 9:00 am – 9:20 am: USDA Updates – *Todd Campbell (USDA)*

Presentations

- 9:20 am – 9:50 am: Subcommittee Instructions for End of Year Recommendations– *Co-Chairs*
- 9:50 am – 10:35 am: Overview of Selected Biomass R&D Board Agencies (*FAA and DOI*)
- 10:35 am – 10:50 am: Break
- 10:50 am – 11:40 am: Board Integrated Supply Chain White Paper – *Bryce Stokes (CNJV)*
- 11:40 am – 12:00 pm: Public Comment
- 12:00 pm – 1:00 pm: Lunch
- 1:00 pm – 1:45 pm: Federal Initiatives for Aviation Fuels (*DOD, DOE, USDA*)

Breakouts

- 1:45 pm – 2:15 pm: Subcommittee Instructions Continued– *Co-Chairs*
- 2:15 pm – 4:45 pm: Subcommittee Breakouts
- 4:45 pm – 5:15 pm: Biomass Research & Development Initiative Update – *Dr. Sonny Ramaswamy, (USDA) NIFA Director*
- 5:15 – 5:30 pm: Day 1 Subcommittee Report Out

Agenda at a Glance - Day 2

Thursday, August 15th

- 8:00 am – 8:30 am: Breakfast

Presentation

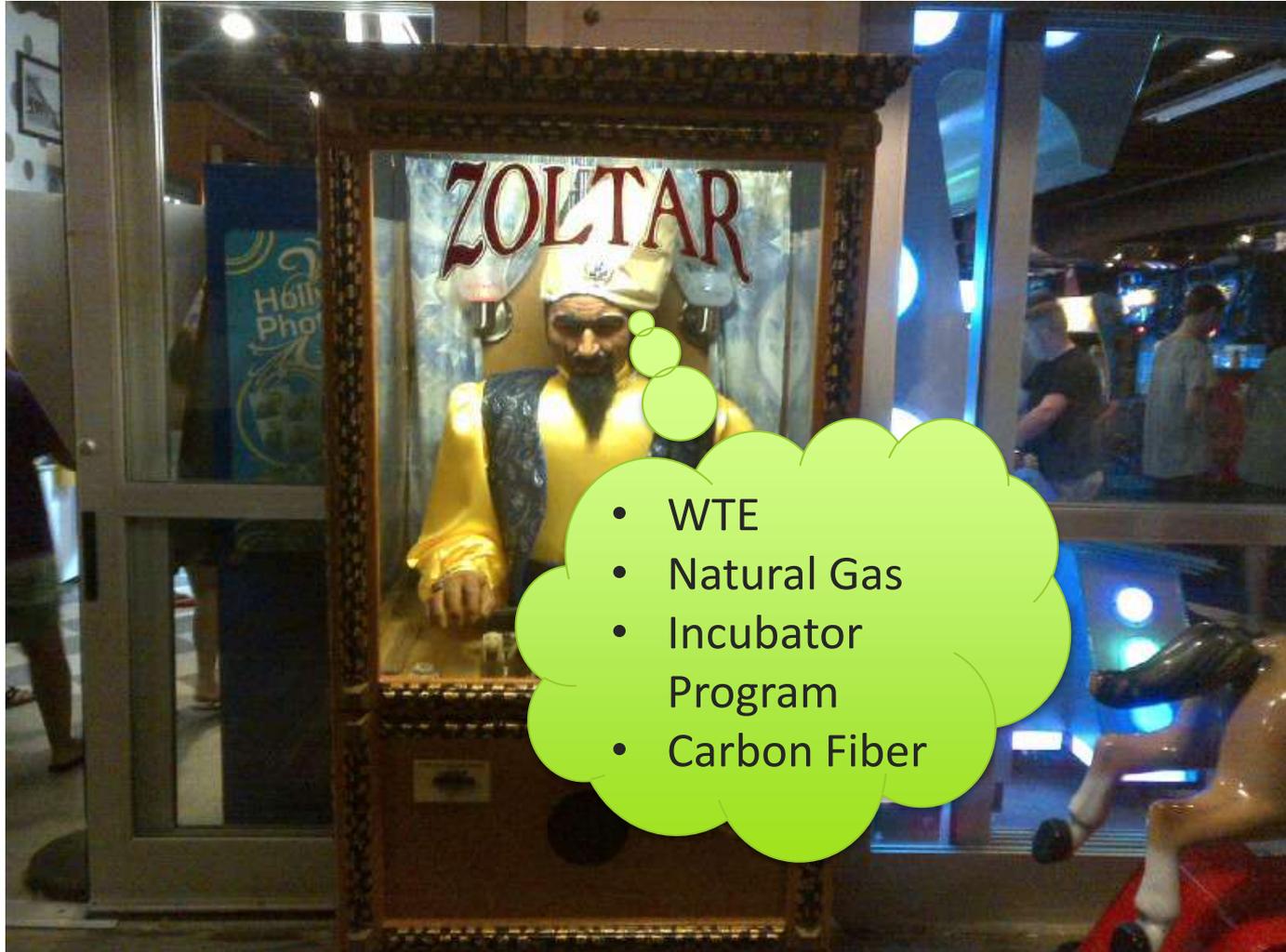
- 8:30 am – 9:15 am: Overview of Selected Biomass R&D Programs – *Sharlene Weatherwax (DOE)*

Breakouts

- 9:15 am – 10:30 am: Subcommittee Breakouts
- 10:30 am – 11:30 am: Subcommittee Report Outs
- 11:30 am – 12:00 pm: Next Steps and Preparation for 4th Quarter meeting
- 12:00 pm – 12:15 pm: Public Comment
- 12:15 pm – 12:30 pm: Closing Comments and Next Steps – *Co-Chairs*
- 12:30 pm – 1:00 pm: Lunch

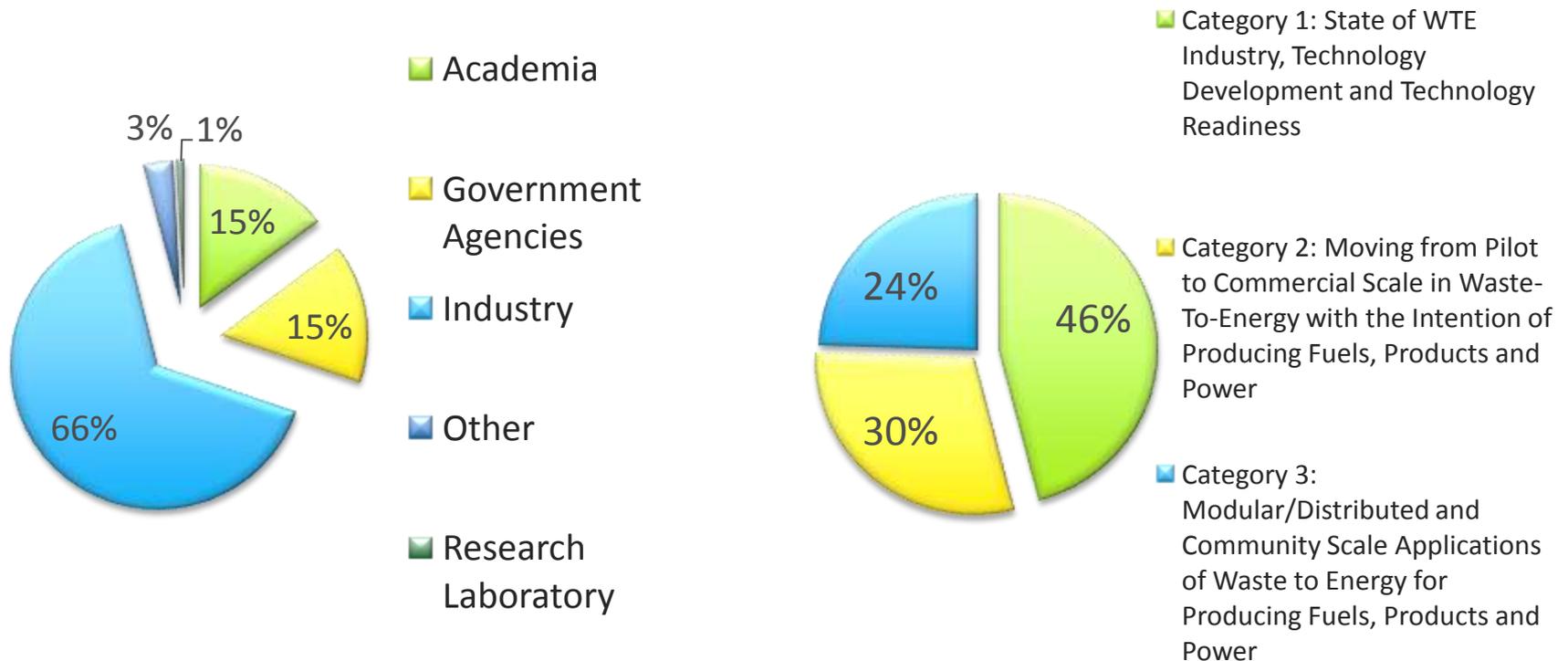
Adjourn

New Directions for the Bioenergy Technologies Office



Waste to Energy RFI Data Analysis

- Over 125 responses were gathered across the three categories
- Most responses from the current sample discussed thermal pathways utilizing MSW as needing federal assistance for RDD&D
- Major barriers included public perception of gasification as incineration; economic and financial challenges associated with risk; and technology immaturity



Natural Gas-Biomass to Liquids Workshop – Overview

The objective of the GBTL Workshop is to obtain input from industry, academia, research establishments, and other experts on pre-competitive R&D barriers to GBTL and effective roles for the DOE. This event is being held in coordination with tcbiomass2013, which is set to take place in Chicago immediately following the workshop.

- For more information on the GBTL Workshop, including registration information, please contact Ashley Rose, ashley.rose@ee.doe.gov

When: September 3, 2013

11:00 AM – 5:15 PM

Where: Chicago, Illinois

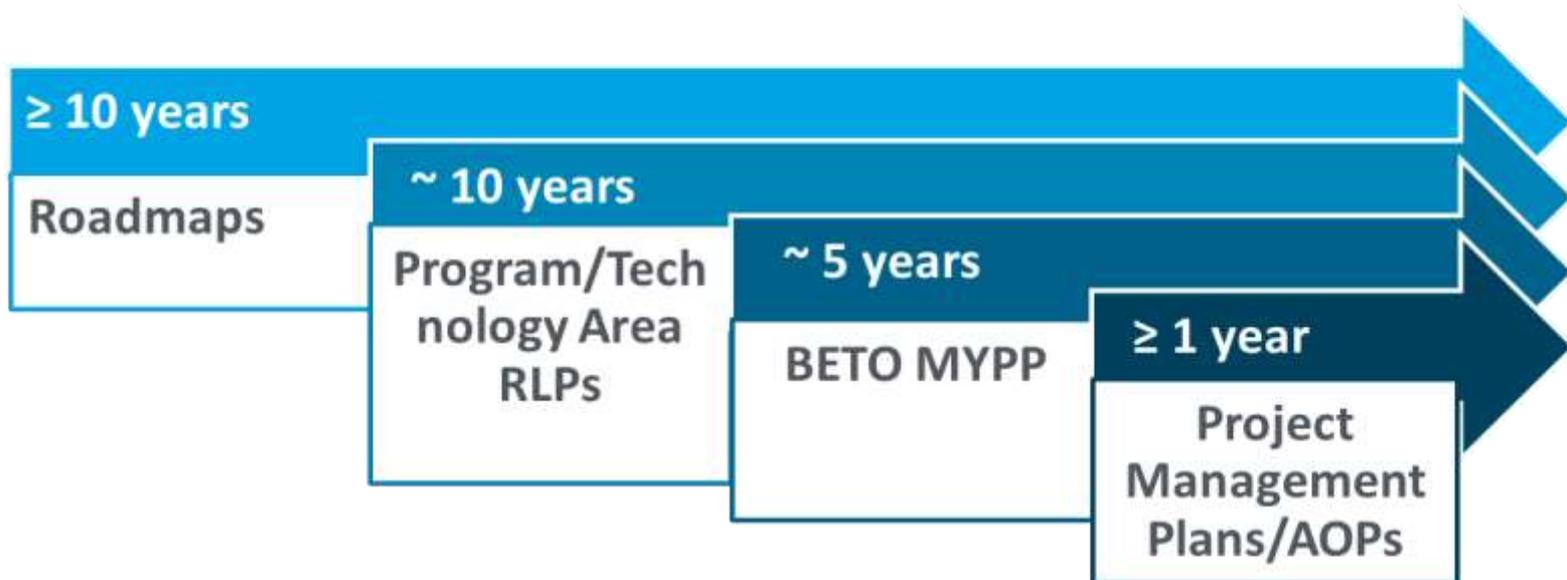


Other New BETO Initiatives

- Incubator Program
 - This aims to provide a dedicated, annual funding mechanism for each EERE technology office for innovative technologies and solutions that are not represented in a significant way in the Office’s existing Multi-Year Program Plan and/or current portfolio. This will allow opportunities for the development and transformation of sustainable biomass into commercially viable biofuels, bioproducts, and biopower.
- Carbon Fiber
 - Through EERE’s Clean Energy Manufacturing Initiative (CEMI), BETO and other EERE Offices (VTO, AMO) are working together to produce bio-derived carbon fiber from biorefinery products (sugars, lignins, and other chemicals). This effort aims to improve biorefinery economics, reduce dependence on foreign oil, and bring more manufacturing jobs to the U.S.
 - The Renewable Low-Cost Carbon Fiber for Lightweight Vehicles Workshop was held on June 4-5 in Detroit, Michigan. Initial results from the Workshop are now available online at the BETO website.

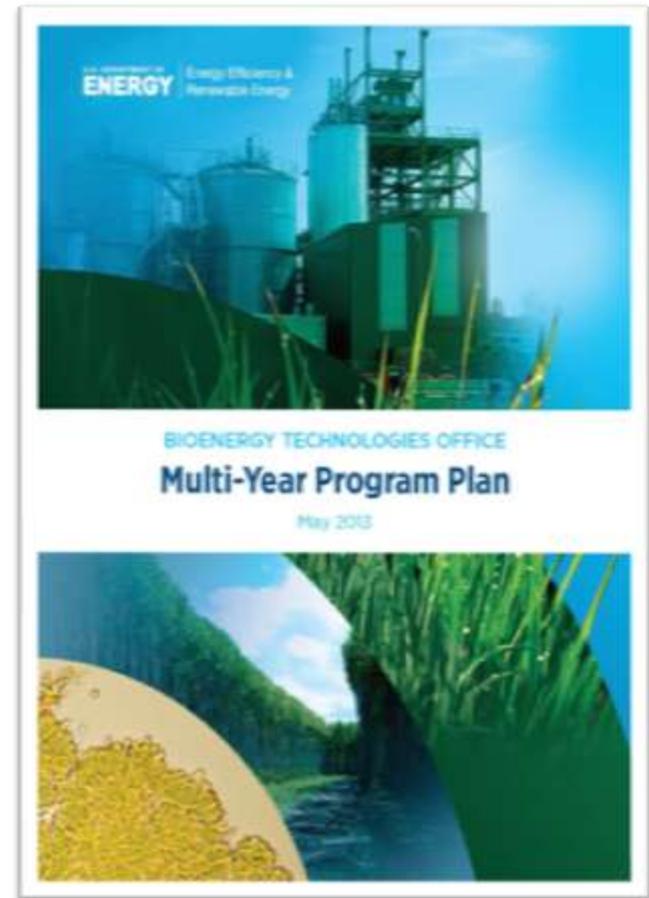
BETO Strategic Planning Overview

- Purpose of BETO strategic planning:
 - Align objectives and activities across multiple stakeholders and interests
 - Document goals, current state of technology, and strategic plans
 - Inform budget processes
 - Track progress
 - Integrate learning
- Based on best practices for technology R&D planning
- Systems engineering approach



BETO Strategic Planning: MYPP

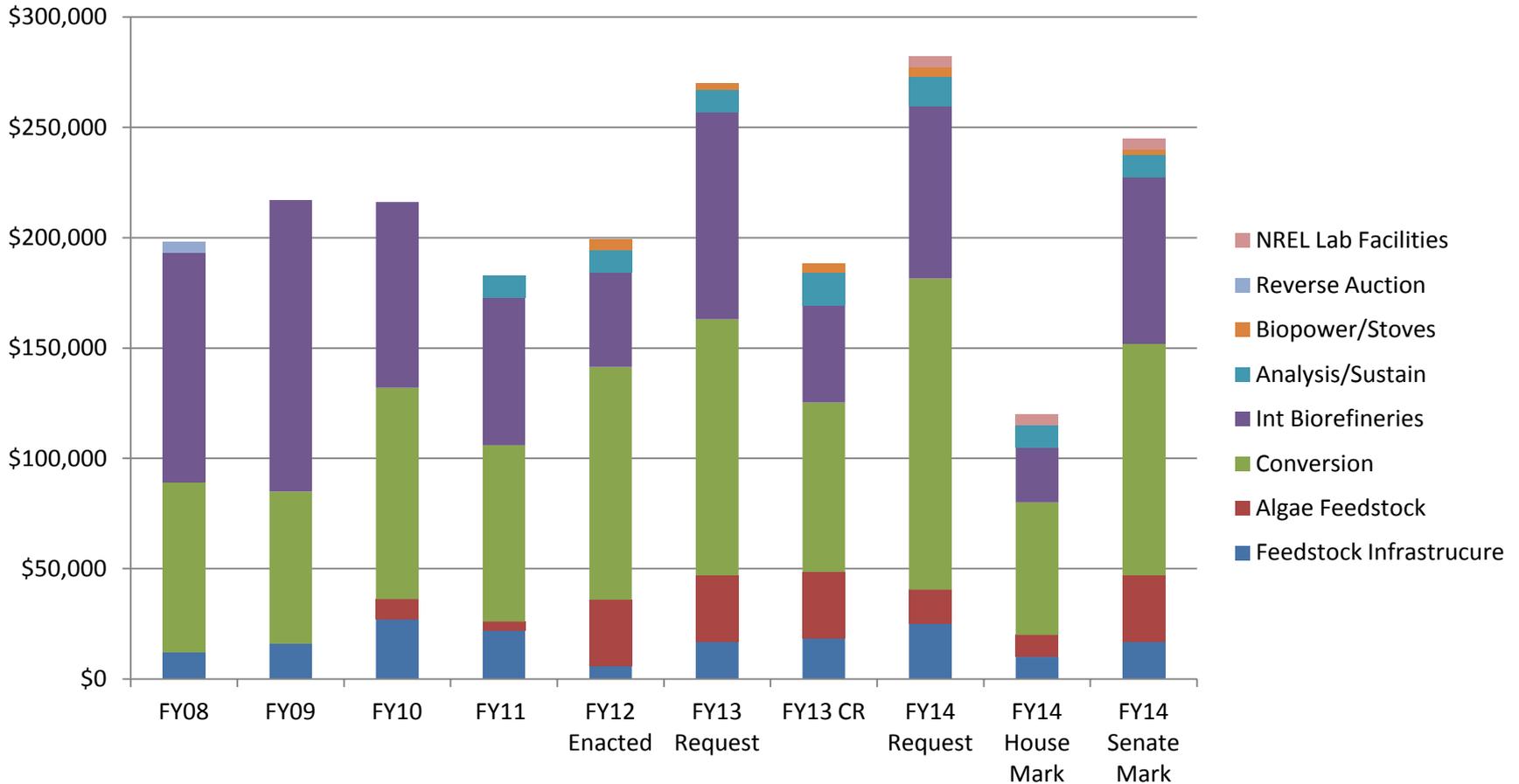
- An updated version of the Multi-Year Program Plan (MYPP) is expected to be available in December of 2013.
- The new version will include updates to many of the design cases, as well as the inclusion of the new algae design case. It will also feature a heavier emphasis on sustainability across the technology areas.



Bioenergy Technologies Office Budget

Annual Appropriations

- Average of \$220M between FY08 - FY14



Bioenergy Technologies Office Solicitations

Carbon, Hydrogen and Separation Efficiencies in Bio-Oil Conversion Pathways (CHASE Bio-Oil Pathways)

On July 1st, 2013, BETO announced the selection of four projects for negotiation under the CHASE Bio-Oil FOA. The projects are:

- Ceramatec – up to \$3.3 M to develop cost-effective technology to separate oxygen from bio-oil. This project will help produce hydrocarbon products suitable for further processing in conventional petroleum refineries.
- Oak Ridge National Laboratory – up to \$2.1 M to efficiently remove the hydrogen from the water found in bio-oil in order to reduce the corrosivity of bio-oil and improve the conversion of hydrogen and biomass to biofuels.
- University of Oklahoma – up to \$4 M to investigate two processes to maximize the amount of renewable carbon and hydrogen that can be extracted from biomass and converted to a refinery-compatible intermediate and suitable for final upgrading to a transportation fuel.
- Virent, Inc. – up to \$4 M to develop an innovative separation process which uses its BioForming® technology to efficiently convert carbon from lignocellulosic biomass into hydrocarbon fuels. Idaho National Laboratory will also bring their feedstock pre-processing capabilities to the project.

Bioenergy Technologies Office Solicitations

Advanced Biomass Feedstock Logistics Systems II

At Biomass 2013, Secretary Moniz announced the selection for the Advanced Biomass Feedstock Logistics Systems solicitation. The project awardee, FDC Enterprises, will reduce harvesting, handling and preprocessing costs across the entire biomass feedstock supply chain.

The FDC Enterprises project will receive up to \$5.7 M to work with independent growers and biofuels companies in Iowa, Kansas, Virginia and Tennessee – including POET, ADM, Clariant International and Pellet Technology USA – to develop new field equipment, biorefinery conveyor designs and improved preprocessing technologies. The project will also develop and deploy feedstock quality-monitoring tools to reduce sampling and analysis costs, and conduct real-time analysis of feedstock characteristics such as moisture content and particle size.

Bioenergy Technologies Office Solicitations

Advancements in Algae Biofuel Yield (ABY)

At Biomass 2013, Secretary Moniz also announced the selections for the Algae Biofuel Yield FOA:

- Hawaii Bioenergy – up to \$5 M to develop a cost-effective photosynthetic open pond system to produce algal oil and demonstrate preprocessing technologies that reduce energy use and the cost of extracting lipids and producing intermediates.
- Sapphire Energy – up to \$5 M to develop a new process to produce algae-based fuel that is compatible with existing refineries. The project will also work on improving algae strains and increasing yield through cultivation improvements.
- New Mexico State University – up to \$5 M to increase the yield of a microalgae, while developing harvesting and cultivation processes that lower costs and support year-round production.
- California Polytechnic State University – up to \$1.5 M to conduct research and development work to increase the productivity of algae strains and compare two separate processing technologies.

Bioenergy Technologies Office Solicitations

Clean Biomass Cookstoves

- University of Washington – up to \$900K
 - Multidisciplinary Design of an Innovative Natural Draft, Forced Diffusion Cookstove for Woody and Herbaceous Biomass Fuels in East Africa.
- Aprovecho – up to \$700K
 - Improved Biomass Cooking Stoves
- Oak Ridge National Laboratory – up to \$600K
 - Combustion Materials Durability Relationships for Improved Low-Cost, Clean Cookstoves
- Lawrence Berkeley National Laboratory – up to \$2.179M
 - An Affordable Advanced Biomass Cookstove with Thin Film Thermoelectric Generator (TGB) Module

2012 Biomass R&D Initiative Award Selected by DOE

Humboldt State University-Waste to Wisdom: Utilizing forest residues for the production of bioenergy and biobased products

Funding: \$5.8 M from DOE

Objectives: Utilize forest residues for the production of bioenergy and biobased products.

- Using mobile biomass conversion technologies and optimized biomass operations logistics to produce torrefied pellets, briquettes and biochar.
- Perform economic and life cycle analyses to quantify the economic and environmental

Benefits: Enhance the economic viability of forest residue utilization. Outcomes from this project will support economic development in rural, forest-dependent communities and provide increased environmental benefits (carbon sequestration) through positive impacts on the forest soils (biochar) and incidence on catastrophic wildfires.

BIOMASS 2013:

HOW THE ADVANCED BIOINDUSTRY IS RESHAPING AMERICAN ENERGY



- Occurred July 31-August 1 at the Washington Convention Center
- This year's event focused on celebrating successes, current trends and frontiers, as well as highlighting sustainability and biorefinery projects.
- Secretary of Energy Ernest Moniz, and Secretary of Agriculture Tom Vilsack, both delivered keynote speeches at the event.
- The final attendee list reached nearly 500 registrants for the event, which included members of government, academia, and industry.

Technical Breakout Sessions

Biomass and the U.S. Competitive Advantages for Manufacturing Clean Energy Products	Synthetic Biology and the Promise of Biofuels
Advancing Alternative Fuels for the Military and Aviation Sector	End Use and Fuel Certification
Beyond Biofuels	Navigating Roadblocks on the Path to Advanced Biofuels Deployment
Natural Gas & Biomass to Liquids	Working Together: Conventional Refineries and Bio-Oil R&D Technologies
Examining Biomass Sectors that are Gaining Traction, Breaking Ground and Building Capacity	

Peer Review

Bioenergy Technologies Office Program Management Review

July 30, 2013 : Renaissance Hotel, Washington D.C.

- Results from the May 2013 Project Peer Review were highlighted and the overall focus and proposed future direction for the Office were reviewed.
- Results of the Peer Review Process will be presented to EERE management and will be used to inform strategic planning, budget formulation, upcoming FOA development, and other budget and funding decisions.
- The final summary report is expected to be released within the next few months.
- Also presented at the Program Management Review were BETO staff presentations on strategic planning, new programmatic initiatives, and interagency collaborations.
- The Review had 128 registered attendees, and the full results of the BETO Project Peer Review and Program Management Review will be available in a final Peer Review Report.
- The External Steering Committee gave a very positive review of the BETO portfolio and a “step-change” improvement in the peer review process.

2013 PROGRAM
MANAGEMENT
REVIEW

U.S. DEPARTMENT OF ENERGY • BIOENERGY TECHNOLOGIES OFFICE

IBR Recommendations from Peer Review

- “[The] biggest strengths of the portfolio were the actual construction of facilities which were preparing to produce significant quantities of advanced biofuels.”
- “[The] BETO program is doing an excellent job supporting a variety of technologies with varying TRLs.”
- Fund more pilots, less demo’s and even fewer commercial/facilities to prove a pathway
- Explore potential synergies with natural gas and syngas technologies

IBR Successes

INEOS Bio

- Waste to ethanol
- 8mgy of advanced biofuel
- 6MW of renewable power
- 400 jobs
- \$4 million annual payroll to local community

First shipment
of Cellulosic
Ethanol on
7/31/13

Kior

- Initiated Production in 2012
- Wood to diesel
- 13mgy of advanced biofuel
- 100 FTE
- Reduces LCA GHG by more than 80%

BETO Leadership Team

- Valerie Reed, Acting Director
- Alison Goss Eng, Operations Supervisor
- John Ferrell, Program Manager, Feedstock Supply & Logistics
- Zia Haq, Lead Analyst, DPA
- Kevin Craig, Program Manager, Conversion
- Jim Spaeth, Acting Program Manager, Demonstration & Deployment
- Neil Rossmeissl, Program Manager, Algae

Impact of EERE Reorganization

Sustainable Transportation

- Bioenergy Technologies Office
- Fuel Cell Technologies Office (FCTO)
- Vehicle Technologies Office (VTO)

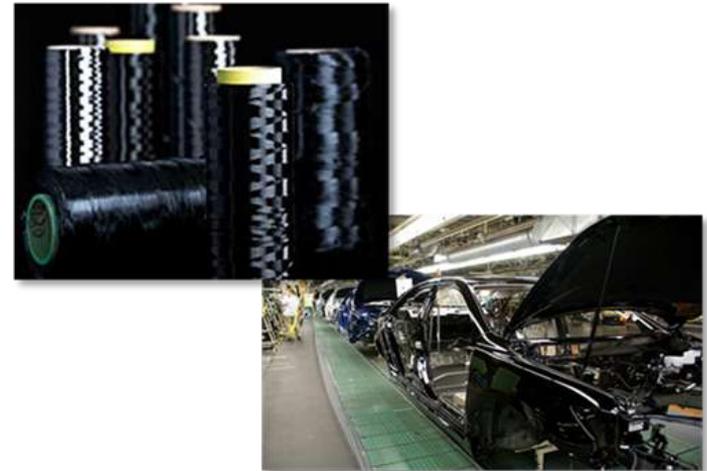


VTO partners with the BETO to support:

- Fuel characterization and combustion testing for biofuels and biofuel blends
- Infrastructure and materials analysis to facilitate biofuel deployment

EERE recently launched the Clean Energy Manufacturing Initiative (CEMI)

- BETO partnered with the Advanced Manufacturing Office and VTO to host a workshop on renewable, low-cost carbon fiber for lightweight vehicles.



Federal Partnerships

- The Bioenergy Technologies Office works directly within the Department of Energy and with other cabinet agencies on a number of high-level initiatives.
- By coordinating efforts across agencies, our Office can tap into others' expertise, leverage existing initiatives in the Federal government, and stay informed on the latest innovations in the field.
- BETO works diligently to ensure steady collaboration across the entire supply chain – bringing together experts in the field to solve the major challenges facing the industry today.



Feedstock Supply

DOE, USDA, NSF



Biomass Conversion

DOE, USDA , NSF



Bioenergy Distribution

DOE, DOD,
DOT, EPA



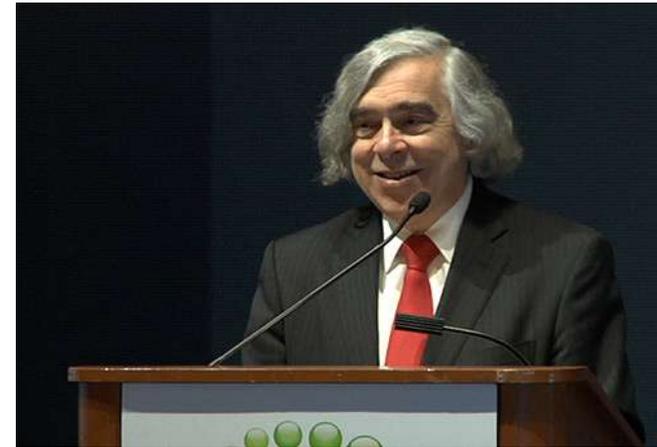
Bioenergy End Use

DOE, EPA, USDA
DOD, DOT

DOE Reorganization

- In July, the current position of Under Secretary for Science was expanded to encompass both science and energy. The resulting Office of the Under Secretary for Science and Energy will manage:
 - Office of Science (SC)
 - Office of Fossil Energy (FE)
 - Office of Energy Efficiency and Renewable Energy (EERE)
 - Office of Nuclear Energy (NE)
 - Office of Electricity Delivery and Energy Reliability (OE)
 - Office of Indian Energy (IE)
 - Office of Technology Transfer Coordinator

- Another senior leadership position at DOE may be created to manage operational responsibilities.



Secretary Moniz at Biomass 2013

Federal Register for New TAC Members

On July 31, 2013, the Federal Register Notice soliciting nominations for new TAC candidates was released.

Nominee's name, resume, biography, and any letters of support must be submitted by August 30th, 2013, by one of the following methods:

- E-mail to elliott.levine@ee.doe.gov
- Overnight delivery service to the Designated Federal Official for the Committee, Office of Energy Efficiency and Renewable Energy, U.S. Department of Energy, Mail Stop EE-2E, 1000 Independence Avenue, SW., Washington, DC 20585

Nominations this year are needed for the following categories in order to address the Committee's needs:

- (G) an individual associated with state government who has expertise in biofuels and biobased products;
- (H) an individual with expertise in energy and environmental analysis; and
- *Nominations for other categories will also be accepted.*

Useful Links

Bioenergy Technologies Office Links:

1. BETO Multi-Year Program Plan, May 2013 Update
http://www1.eere.energy.gov/bioenergy/pdfs/mypp_may_2013.pdf
2. BETO Funding Opportunities
http://www1.eere.energy.gov/biomass/biomass_solicitations.html
3. CHASE Selections
http://www1.eere.energy.gov/bioenergy/news_detail.html?news_id=19404
4. 2013 Peer Review
http://www1.eere.energy.gov/biomass/peer_review2013.html
5. Biomass 2013 http://www1.eere.energy.gov/biomass/biomass_2013.html
6. Natural Gas Workshop Webpage
http://www1.eere.energy.gov/bioenergy/gbtl_workshop.html
7. Carbon Fiber Workshop Webpage
http://www1.eere.energy.gov/bioenergy/carbon_fiber_workshop.html
8. Federal Register Notice <https://www.federalregister.gov/articles/2013/07/31/2013-18400/biomass-research-and-development-technical-advisory-committee>