



Biomass R&D Technical Advisory Committee

November 21-22, 2013

Elliott Levine

DOE Updates

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 November meeting: **December 22nd**

Future Meeting Dates

- Tentative dates for Q1 meeting have been identified below and will be confirmed during the meeting:
 - Q1: Week of February 24-28, 2013

Q4 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. DOE and USDA Biomass Updates
8. Proposed 2014 TAC Meeting Dates

Agenda at a Glance - Day 1 of 2

Thursday, November 21st

Introduction and Welcome

- 8:00 am – 8:30 am: Breakfast
- 8:30 am – 8:40 am: Welcome – *Committee Co-Chairs*

DOE & USDA Updates

- 8:40 am – 9:10 am: DOE Updates – *Elliott Levine (DOE)*
- 9:10 am – 9:25 am: DOE Updates – *Jonathan Male (DOE)*
- 9:25 am – 10:25 am: BETO Peer Review – *George Parks (FuelScience LLC)*
- 10:25 am – 10:40 am: Break
- 10:40 am – 11:00 am: USDA Updates – *Todd Campbell (USDA)*

Breakout

- 11:00 am – 12:00 pm: Subcommittee Breakout

Lunch & Public Comment

- 12:00 pm – 1:00 pm: Lunch
- 1:00 pm – 1:15 pm: Public Comment

Discussions & Votes

- 1:15 pm – 4:15 pm: Subcommittee Reports and Discussion of Recommendations
- 4:15 pm – 4:30 pm: Vote on 2013 Annual Recommendations
- 4:30 pm – 5:30 pm: Develop Committee Presentation for Subsequent Biomass Board Presentation

Agenda at a Glance - Day 2 of 2

Friday, November 22nd

Welcome

- 8:00 am – 8:30 am: Breakfast

Panel

- 8:30 am – 10:00 am: Use of Marginal Lands for Bioenergy

Presentation & Discussion

- 10:00 am – 10:30 am: Natural Gas to Liquids Workshop Summary – *Zia Haq (DOE)*
- 10:00 am – 10:30 am: Break
- 10:45 am – 11:15 am: 2014 Committee Activities and Needs – *Committee Co-Chairs*

Public Comment

- 11:15 am – 11:30 am: Public Comment

Closing Remarks

- 11:30 am – 12:00 pm: Final Comments
- 12:00 pm – 1:00 pm: Lunch

Adjourn

Reappointed Members (In-Process)

- Committee Co-Chair: Dr. Kevin Kephart, Vice President for Research, South Dakota State University
- Harrison Dillon, Senior Advisor, Solazyme
- Maureen McCann, Professor and Assistant Head of Biological Sciences, Purdue University
- David Nothmann, Vice President, AgriFood, Battelle Memorial Institute
- William Provine, Director of Biochemical Science and Engineering, Biofuels Division, Dupont
- John Tao, CEO, O-Innovation Advisors, LLC
- James Seiber, Department Chair for Food Science & Technology, University of California, Davis

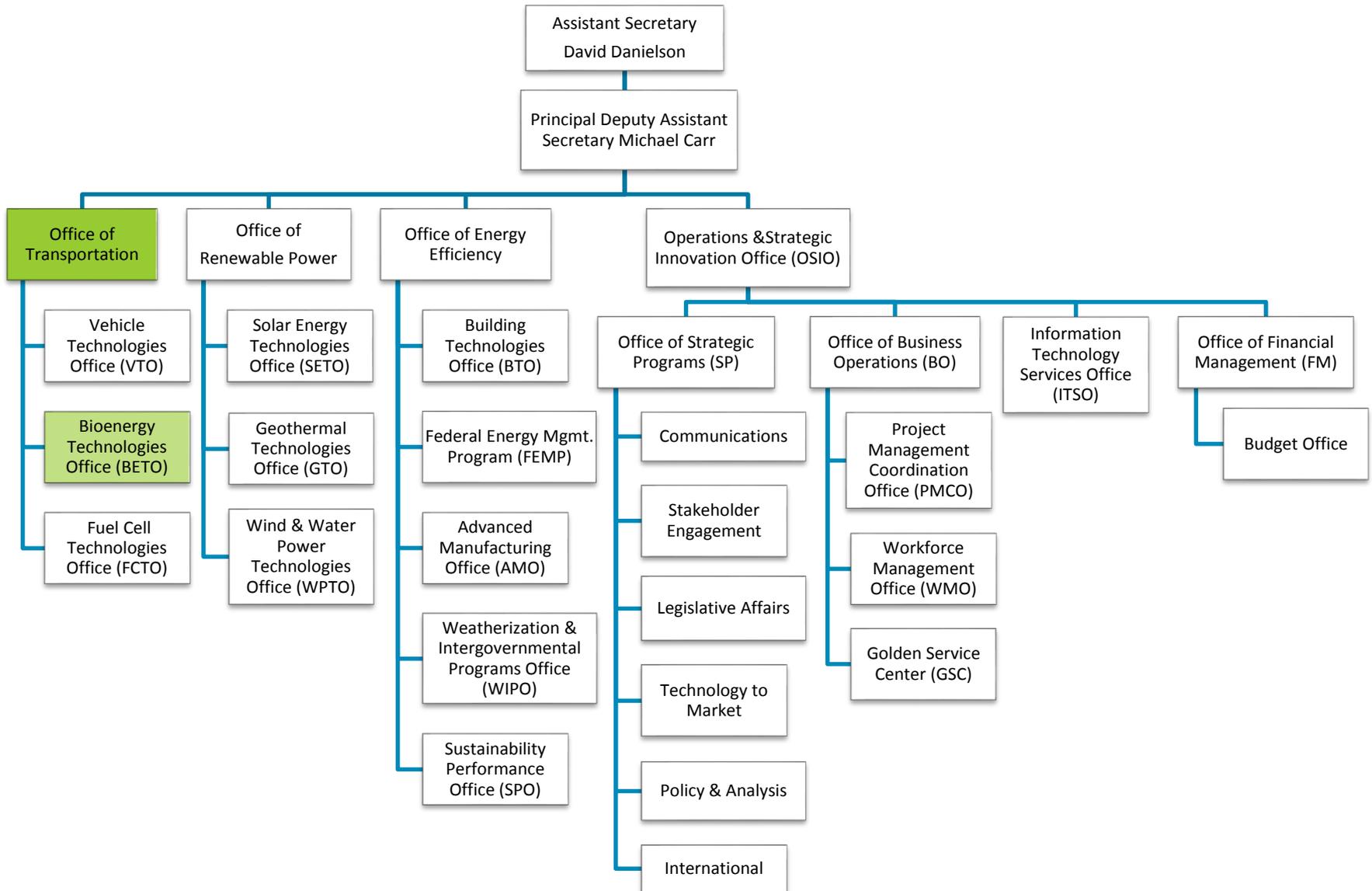
Departing Members

- Committee Co-Chair: Ronnie Musgrove, Former Governor of Mississippi
- Huey-Min Hwang, Professor, Department of Biology, Jackson State University
- Neal Gutterson, President and Chief Executive Officer, Mendel Biotechnology
- Jay Levenstein, Deputy Commissioner, Florida Department of Agriculture and Consumer Services

BETO Announcements & Updates



EERE Reorganization (Slide 1 of 2)



EERE Reorganization (Slide 2 of 2)

Sustainable Transportation

- Bioenergy Technologies Office (BETO)
- 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



Clean Energy Manufacturing Initiative (CEMI)

- In coordination with DOE's Advanced Manufacturing and Vehicle Technologies Offices, BETO hosted the "Renewable Low-Cost Carbon Fiber for Lightweight Vehicles Workshop" in June 2013. The workshop combined insight and expertise from different EERE offices to support end-to-end technology development for an enhanced domestic supply chain for low-cost carbon fiber that has the potential to increase energy productivity and the competitiveness of U.S. manufacturing.
- Findings from the workshop have been compiled into a summary report. To learn more about the workshop, please visit BETO's Carbon Fiber [Web page](#).



BETO Requests for Information

- **Demonstration and Deployment Strategies**

- Announced November 5, 2013
- Closes: December 6, 2013
- BETO seeks stakeholder feedback regarding bioenergy technology validation to accelerate the deployment of advanced biofuel, bioproducts, and biopower technologies. BETO is specifically interested in technologies that are ready for technology validation at a technology readiness level (TRL) of 6 or higher.

Areas of Interest 1 through 4 – Conversion Technologies:

1. Drop-in, hydrocarbon advanced biofuels in new or expanded facilities
2. Improvements to specific unit operations or processes for advanced biofuel production in existing facilities
3. Non-fuel bioproducts, such as lubricants or chemicals, that will contribute to "replacing the whole barrel"
4. Advanced biopower, excluding combustion systems that generate steam for heat and power

Areas of Interest 5 through 6 – Feedstock Technologies:

5. Feedstock supply and logistics systems for high impact feedstocks
6. Algae utilization, including harvesting, processing, and conversion

Areas of Interest 7 through 9 – Enabling Technologies:

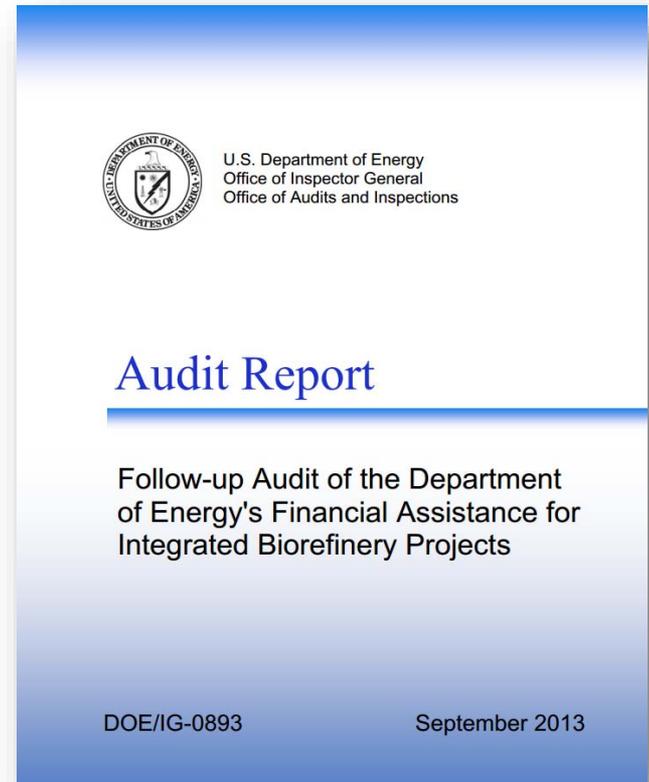
7. Early adoption opportunities for advanced bioenergy production such as, but not limited to, renewable home heating oil and renewable marine fuel applications
8. Solids handling systems for pressurized reactor interfaces, such as for biomass feeding or ash and char removal
9. Market barriers such as infrastructure needs or fuel compatibility

- **Carbon Fiber**

- Announced August 21, 2013
- Closed: September 6, 2013
- BETO has issued a request for information (RFI) on the need for federal financial assistance to research, develop, demonstrate and deploy emerging renewable carbon fiber technologies.

Inspector General Report (Slide 1 of 2)

- Report released September 2013
- Audit conducted February 2012 to August 2013
- Background: BETO issued three Funding Opportunity Announcements (FOAs) in 2006, 2007 and 2009, resulting in the selection of 29 projects
- Stated DOE goal: Demonstrate operation of three integrated biorefineries by 2012, and validate annual production capacity of 100 million gallons of advanced biofuels by 2014
- Report findings: “Despite over 7 years of effort and the expenditure of about \$603 million, the Department had not yet achieved its biorefinery development and production goals.”



Findings and Recommendations (Slide 2 of 2)

Identified challenges and concerns:

- “The Program's challenges in meeting its performance goals occurred primarily because selected projects were not at the level of technical readiness needed for commercial development and poor market and financial conditions.”

Positive steps that BETO took to reduce risk:

- BETO implemented budget phases and released funding to recipients only after specific project milestones and performance metrics had been validated
- BETO officials put some projects on hold because recipients failed to meet their cost-share requirements

Recommendations:

1. Validate biomass technology at each scale of development, including pilot and demonstration, before awarding funds for the next scale;
2. Implement the recommendation of the 2011 integrated biorefinery peer review to formally document common issues that delay projects or cause cost overruns, as well as project successes and best practices, establish action plans consistent with Department procedures, and communicate lessons learned within the Department; and
3. Resolve the recommendation of the 2011 integrated biorefinery peer review to conduct a "Blue Ribbon" review of a project failure.

July 2013 Cyber Security Incident

- DOE confirmed a cyber incident occurred at the end of July which resulted in the unauthorized disclosure of federal employee Personally Identifiable Information (PII).
 - DOE's Cybersecurity office, the Office of Health, Safety and Security and the Inspector General's office are working with other federal law enforcement to obtain information concerning the nature of the incident.
 - No classified data was targeted or compromised.
 - DOE Federal employees and contractors may be affected by the incident.
- DOE believes about 14,000 past and current DOE employees' PII may have been affected. Current and former employees receiving an individual notification will be provided with additional information and offered assistance on protecting themselves from potential identity theft.
- DOE will offer affected personnel free credit monitoring for one year as well as provide recommendations and best practices for minimizing the potential for identity theft.
- DOE does not believe that PII theft was the primary purpose of the attack.
 - Files containing PII made up less than 1 percent of the total number of files known to be compromised.
- Identity Theft Prevention Methods:
 1. The DOE is providing a free one year subscription to review your credit report
 2. Place a fraud alert on your credit line
 3. Order a free annual credit report
 4. Put a "freeze" on your credit line
 5. If you see something on your credit report, file a complaint



USDA-DOE

Plant Feedstock Genomics for Bioenergy

A joint competitive grants program initiated in 2006
(DOE-BER and USDA-NIFA)

Genomics-based research leading to improved use of biomass and plant feedstocks for the production of fuels such as ethanol or renewable chemical feedstocks:

- Improve biomass characteristics, biomass yield, or sustainability;
- Systems biology approaches enabling efficient manipulation and breeding;
- Prediction of phenotype from genotype that could lead to improved feedstock characterization and sustainability.

FY2014 Solicitation Will Be Released in Late November 2013

(Slide 1 of 4)

USDA-DOE Plant Feedstocks Genomics for Bioenergy



NATIONAL INSTITUTE OF FOOD AND AGRICULTURE
U.S. DEPARTMENT OF AGRICULTURE



U.S. DEPARTMENT OF
ENERGY

Office of Science

Seven Total Awards in FY 2013 (DE-FOA-0000770)

- Functional Manipulation of Root Microbe Populations for Improved Feedstock Performance
- Unraveling Genetics of Biomass Traits Differentiating Frost Tolerance Ecotypes in Switchgrass
- Understanding Genetic Control of Flowering in Switchgrass to Improve Biomass Yields
- Pyramiding Genes and Alleles for Improved Energy Cane Biomass Yield
- Analyzing Epigenetic Regulation of Drought Stress in Sorghum
- **Development of Improved Pine Feedstocks for Bioenergy and Renewable Chemicals Using Genome-Wide Selection**
- **Structural Polymorphisms in Poplar Related to Growth, Stress Tolerance, and Breeding Efficiency**



USDA funded projects in red font

(Slide 2 of 4)

DOE Genomic Science Program: Systems Biology Research Enabling Production of Next Generation Biofuels



Genomics-based research aimed at enhancing fundamental systems biology understanding of microbes relevant to the production of next generation biofuels by:

- Advancing a broader suite of microbes to “model organism” status;
- Developing novel functional characteristics or biosynthetic pathways necessary for biofuels production, and;
- Associated development of analytical technologies for functional characterization and high-throughput phenotyping.

FY2014 Solicitation Will Be Released in December 2013

(Slide 3 of 4)

DOE Joint Genome Institute & Environmental Molecular Sciences Laboratory: Joint Call for Exploratory Collaborations

New awards in –Omics Enabled Tech Development

- Analysis of Organelles Promoting Terpenoid Biosynthesis in Filamentous Fungi
- Development of Novel Approaches to Analyze Microbial Carbon Cycling in Biomass-Focused Agricultural Soils
- A Functional Encyclopedia of Cyanobacteria - Building the Knowledge Framework for an Enhanced Understanding of Carbon and Nitrogen Metabolism
- Engineering Fungal Morphology and Secretion to Enhance Fermentative Productivity
- Identification and Regulation of Cellulases within Novel Anaerobic Fungi
- Genome-enabled Investigations of the Role of Secreted Proteins and Reactive Metabolites in Carbon Degradation by Pure and Mixed Ascomycete Fungal Communities

(Slide 4 of 4)



Joint Genome Institute: A DOE User Facility

JGI provides a community resource for genome and metagenome sequencing of microbes, plants, and more complex communities as well as genome annotation, functional analysis and verification of genome-scale biological system models.



Environmental Molecular Sciences Laboratory: A DOE User Facility

EMSL's suite of over sixty state-of-the-art instruments enables molecular-scale experimental and theoretical research on aerosol chemistry, biological systems, geochemistry, biogeochemistry, and interfacial and surface science.

Recent & Upcoming Noteworthy Events

- IEA Bioenergy ExCo – November 11-13 (Jeju, Korea)
- Wood Stove Decathlon – November 15-19 (Washington, DC)
- Algal Biofuels Strategy Workshop – November 19-20 (Mesa, AZ)
- Bio Pacific Rim Summit – December 8-11 (San Diego, CA)
- INEOS and Myriant ribbon-cuttings – TBD

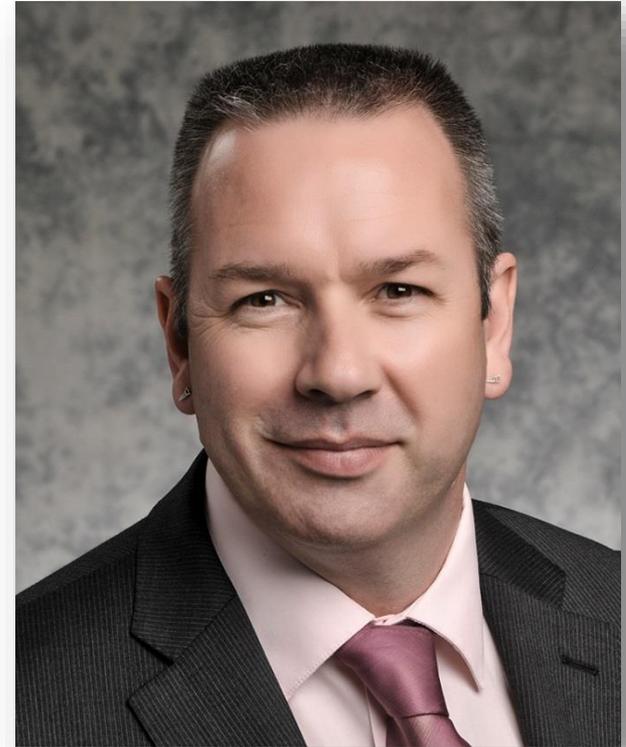


BETO Leadership Team

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

New BETO Director: Jonathan Male

- **Education**
 - Executive MBA, State University of New York at Albany
 - PhD, Chemistry, Simon Fraser University
 - BS, Applied Chemistry, University of Greenwich
- **Professional Experience**
 - Pacific Northwest National Lab
 - GE Global Research
- **Expertise**
 - Development and execution of research programs
 - Research and development of catalysts (both homogeneous and heterogeneous)
 - Development and implementation of high-throughput experimentation technologies
- **Current role: BETO Director**
 - Leads BETO's overall strategic, technical, and project oversight of efforts to improve performance, lower costs, and accelerate market entry of advanced biofuels and bioproducts
 - Oversees BETO support for its approximately \$200 million of annual funding for research, development, and demonstration activities through public-private partnerships across the bioenergy and bioproducts supply chain



Useful Links

References:

1. Inspector General Report <http://energy.gov/sites/prod/files/2013/09/f2/IG-0893.pdf>
2. BETO Announcement: Demonstration and Deployment Strategies RFI http://www1.eere.energy.gov/bioenergy/news_detail.html?news_id=21019
3. BETO Announcement: Carbon Fiber RFI http://www1.eere.energy.gov/bioenergy/news_detail.html?news_id=19546
4. Identity theft <http://www.ftc.gov/idtheft/> or http://www.treasury.gov/services/report-fwa/Pages/id_theft.aspx
5. Cyber incident information <http://go.usa.gov/47sQ>
6. Carbon Fiber Workshop Summary Report http://www1.eere.energy.gov/bioenergy/pdfs/carbon_fiber_summary_report.pdf
7. BETO Carbon Fiber Workshop http://www1.eere.energy.gov/bioenergy/carbon_fiber_workshop.html
8. Wood Stove Decathlon <http://www.forgreenheat.org/>
9. New York Times: Cleaner-burning Wood Stove http://www.nytimes.com/2013/11/20/science/earth/contest-aims-for-a-cleaner-burning-wood-stove.html?_r=0

Useful Links:

1. BETO News and Announcements <http://www1.eere.energy.gov/bioenergy/news.html>
2. Upcoming Solicitations http://www1.eere.energy.gov/biomass/biomass_solicitations.html
3. 2013 Peer Review http://www1.eere.energy.gov/biomass/peer_review2013.html
4. Biomass R&D Board <http://www.biomassboard.gov/>