

**Meeting Summary:**

**Biomass Research & Development  
Technical Advisory Committee**

**February 6-7, 2008**

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## **I. Purpose**

On February 6-7, 2008, the Biomass Research and Development Technical Advisory Committee (Committee) held its first quarterly meeting of calendar year 2008. The purpose of the meeting was to hear presentations on baseline biomass work and budgets at the U.S. Department of Energy (DOE) and U.S. Department of Agriculture (USDA), introduce new Committee members including a new co-chair, and receive an update on the Farm Bill, Energy Security and Independence Act of 2007, and the USDA-DOE joint solicitation. The Committee also heard presentations from USDA on the Agricultural Research Service (ARS) biofuels activities and the energy science, education and extension plan. The Planning Subcommittee reported to the Committee on draft responses to questions from the Board, aimed at assisting in the development of its National Biofuels Action Plan. The two-day meeting was held at the Crystal Gateway Marriott hotel in Arlington, Virginia.

**Background:** The Committee was established by the Biomass R&D Act of 2000 (Biomass Act) which was revised in the Energy Policy Act of 2005 and further amended by the Energy Independence and Security Act of 2007. The Biomass R&D Board was established under the same act to conduct Federal strategic planning and coordinate activities across the Federal sector to promote the use of biobased fuels, power and products. The Committee is tasked with advising the Secretary of Energy and the Secretary of Agriculture on the direction of biomass research, and evaluating and engaging in strategic planning.

A list of attendees is provided in Attachment A. The agenda is provided in Attachment B. The Planning Subcommittee Report Out is in Attachment C. Meeting presentations are provided in Attachment D.

## **II. Update on the Farm Bill and Energy Security and Independence Act of 2007**

USDA's liaison for the Biomass R&D Technical Advisory Committee, Bill Hagy, gave an update on the Farm Bill. Jennifer Owen, Director, Office of Technology Advancement and Outreach at DOE, provided an update and outlined the Energy Security and Independence Act of 2007.

### **A. Farm Bill**

Bill Hagy of USDA gave a brief update on the status of the Farm Bill. USDA does not currently have funding for the FY 2008 Joint Solicitation, which will be led by the DOE. Funding details are outlined in the table below.

	House of Representatives	Senate
<b><u>Federal Procurement of Biomass Products</u></b>	\$2 million mandatory	\$3 million mandatory
<b><u>Loan Guarantees</u></b>	Loan Guarantees for the financing of Biorefineries/Biofuel Production Plants and Biorefineries	Loan Guarantee Grants for the financing of Biorefineries/Biofuel Production Plants and Repowering Assistance
<b><u>Funding Authority</u></b>	\$800 million –Total for fiscal years (FY) 2008-2012	\$300 million –To remain available until expended
<b><u>Biomass R&amp;D Funding</u></b>	\$420 million over 5 years (mandatory)	\$75 million (FYs 08–10) – mandatory. \$85 million annually (FY 08–12) – discretionary.

The draft Farm Bill includes a Community Wood Energy Program to assist with community wood energy feasibility studies and plans.

## ***B. Energy Security and Independence Act of 2007***

Jennifer Owen, Director, Office of Technology Advancement and Outreach at DOE provided an overview of the recently signed Energy Security and Independence Act of 2007 (EISA). She specifically focused on the new renewable fuels mandate requiring 36 billion gallons of renewable fuels by 2022. Owen explained that EPA holds primary regulatory authority for the Renewable Fuel Standard (RFS), and that EISA has a variety of provisions that DOE has begun to examine and implement.

EISA includes potential provisions for infrastructure, including a \$200 million grant for biofuels infrastructure. Owen emphasized, however, that the government cannot meet all biofuels infrastructure needs on its own and will need private sector involvement.

Owen pointed out that the RFS indicates that Congress expects industry to move beyond corn and towards cellulosic biofuels, with an eventual cap on corn-based fuels. She stated that there are two pillars in EISA, one is the RFS and the other is the advancements in fuel economy standards. The impacts of EISA will be felt for decades. The requirement is enforced through EPA’s authority under the Clean Air Act. The Committee expressed interest in hearing EPA present at a future meeting on the Renewable Identification Number (RIN) system. Scott Mason indicated that currently a RIN versus a gallon of ethanol is being evaluated.

The RFS schedule was created based on analysis of the ability to comply and in recognition of the need for a stretch goal to move the market forward. Several Committee members indicated that the goal in the RFS is not aggressive enough.

### **III. USDA/Research, Education and Economics (REE) - Energy Research, Education and Extension Strategy**

Dr. Ghassem R. Asrar, Deputy Administrator for Natural Resources and Agricultural Systems with Agricultural Research Service (ARS) of USDA, provided an overview of the Strategic Energy Science Plan for Research, Education and Extension (REE). The primary role of the strategy is to “lead research, education and extension programs for sustainable production of agriculture and natural resource-based renewable energy and efficient use and conservation of energy”. Its four main goals are:

1. Sustainable agriculture and natural resource-based energy production
2. Sustainable bioeconomics for rural communities
3. Efficient use of energy and energy conservation
4. Workforce development for the bioeconomy

Additionally, Dr. Asrar briefed the Committee on the Economic Research Service (ERS) ([www.ers.usda.gov](http://www.ers.usda.gov)) and the National Agricultural Statistics Service (NASS) ([www.nass.usda.gov](http://www.nass.usda.gov)). The ERS develops and distributes economic and social science information and analysis. The NASS provides production data and statistics on livestock and animals, crops and plants, economics, demographics and the environment.

### **IV. Bioenergy Program**

Dr. Ghassem R. Asrar, Deputy Administrator for Natural Resources and Agricultural Systems with Agricultural Research Service (ARS) of USDA, gave a second presentation on the USDA/ARS Bioenergy Program.

The presentation described in detail the four components of the ARS Bioenergy Program, which are: Feedstock Development; Feedstock Production; Conversion and Co-Products; and Integration. Dr. Asrar outlined the activities and objectives for each component, and highlighted the challenges faced by this current generation of biofuels, particularly the transferring of knowledge from the public to the private sector as rapidly as possible.

### **V. Update on FY 2007 USDA-DOE Joint Solicitation**

Bill Hagy, the USDA’s liaison for the Biomass R&D Technical Advisory Committee, gave an update on the FY 2007 USDA-DOE Joint Solicitation.

Hagy gave a summary of the pre-applications reviewed and the number of applications received. There were 144 full applications received. Applications were organized into four topic areas: 1) feedstock production (45 applications); 2) overcoming recalcitrance of cellulosic biomass (36 applications); 3) product diversification (46 applications); and 4) analysis providing strategic guidance (17). Projects were evaluated based on the following evaluation criteria: technical relevance and merit (40 percent weight); technical

approval/work plan (25 percent weight); energy efficiency/displacement, rural economic development and environment benefits (20 percent weight); and technical, management and facility capabilities (15 percent weight). Based on the merit review in Golden, Colorado in January 2008, 33 projects were recommended for selection. Hagy indicated that the announcement of selections would be in early March 2008, possibly at the Washington International Renewable Energy Conference.

## **VI. Discussion of May 2008 Meeting**

The Committee discussed the options of a field trip for the May 2008 meeting. Possibilities included Iowa, Louisiana and Illinois. The Committee decided that Iowa would be the location for the May meeting with tours of a POET ethanol plant in Coon Rapids, Iowa and a tour at Iowa Energy Center. There will be an optional tour the morning of May 20 with the formal Committee meeting that afternoon. Dinner will be arranged for the evening of May 20, possibly at Pioneer. The morning of May 21 the Committee meeting will resume and that afternoon will be an optional tour at the Iowa Energy Center.

## **VII. Technical Advisory Committee 2008 Work Plan**

The Committee discussed the 2008 Work Plan. The Work Plan includes discussions of the Annual Recommendations at the May meeting, with further correspondence through e-mail and/or conference call and finalization in September. The Committee agreed they should devote much of the September meeting to working on recommendations to the Secretaries. The presentation to the Board at the final meeting of calendar year 2008 should be organized well beforehand. The Committee expressed their wish to meet with the Biomass R&D Board during one of the Board's monthly meetings in 2009.

## **VIII. Technical Advisory Committee Ethics Training**

The Committee received its annual Technical Advisory Committee Ethics Training from Christina Hymer, Assistant General Counsel for General Law at DOE. Hymer reminded the Committee that they are not to conduct personal business at the Committee meetings and should not use their position for personal gain.

## **IX. Transportation of Biofuel through Pipelines**

Narasi Sridhar from Det Norske Veritas (DNV) presented on biofuel transport via pipelines. Sridhar's presentation gave a background on pipeline issues and focused on the outcome of the ethanol roadmap workshop and the status of current research. Currently, ethanol is transported via tanker trucks (67%), rail cars (30%) and barges (2%). These transport modes are reaching capacity with E10 and there will be more safety risks involved with moving higher volumes. Pipelines are a safer and more efficient way to transport large volumes of

fuel. However, ethanol poses some major technical issues for pipeline transportation and storage including stress corrosion, cracking of steel, and other materials issues.

During the Ethanol Roadmap Workshop, held October 25 and 26, 2007, the following areas were addressed:

- Ethanol sources and quality issues
- Pipeline integrity and management issues
- Pipeline operations issues
- Standards, guidelines and training

Current research activities include a short term research project on ethanol blends by a joint industry program and a long-term ethanol blends study and pure ethanol study co-funded by Department of Transportation Pipeline and Hazardous Materials Safety Administration and industry.

Future activities suggested by Sridhar include a need to establish a Center for Biofuels and Alternate Fuels Transportation, which would act as an interface between different biofuels groups and be funded jointly by industry and government.

## **X. Message from Tom Dorr, Under Secretary for Rural Development, USDA**

Tom Dorr, Under Secretary for Rural Development at USDA, spoke to the Committee on the final day, passing along his appreciation for the work of the Committee and to answer any questions from the members.

Under Secretary Dorr emphasized the importance of the biofuels industry and stressed three critical areas: 1) approaching ethanol blend wall; 2) logistics issues; and 3) sustainability.

Some members of the Committee expressed interest in knowing what could be expected from the transition to a new Administration. Under Secretary Dorr responded that no one knows who the new Administration will be and that the best thing to do is empower the USDA liaison and DFO at DOE over the coming months of transition on work with the Committee.

Regarding the issue of sustainability, Committee members mentioned that there is a role in government to bring people together for a dialog on sustainability and issues such as CO<sub>2</sub> emissions.

## **XI. Baseline Biomass Work at U.S. Department of Agriculture**

Baseline biomass work at USDA is heavily reliant on the passing of the Farm Bill. The bill authorizes a large amount of funding to USDA for biomass work, and USDA cannot plan definitively until the legislation is passed.

USDA is active in education and R&D funding. Its work is centered on sustainability, particularly sustainable agriculture and natural resource-based energy production, and sustainable bioeconomics for rural communities. The program also looks at efficient use of energy and energy conservation, and workforce development for the bioeconomy.

The Department works with private industry through its Business and Infrastructure (B&I) program which is designed to improve, develop, and/or finance business, industry, and employment and improve the economic and environmental climate in rural communities. This is done by bolstering the private credit structure by guaranteeing loans.

## **XII. DOE Bioenergy Research Centers**

Patrick Glynn of DOE's Office of Science briefed the Committee on the DOE Bioenergy Research Centers. DOE awarded \$405 million in funding to be provided over the next five years to establish and operate three new Bioenergy Research Centers. The three centers are:

- Bioenergy Science Center (BESC) - Oak Ridge, Tennessee
  - Oak Ridge National Laboratory - lead institution
  - Strong central strategic focus on overcoming “recalcitrance” as major route to cost savings and cost-effective biofuels production
- Great Lakes Bioenergy Research Center (GLBRC) –Madison, Wisconsin
  - University of Wisconsin-Madison in partnership with Michigan State University - lead institution
  - Focus on wide range of plants, including both “model” plants and potential bioenergy crops
  - Includes sustainability of biofuels production
- Joint BioEnergy Institute (JBEI) –Emeryville, California
  - Lawrence Berkeley National Laboratory - lead institution
  - Strong basic science-oriented approach, looking for fundamental transformational, game-changing breakthroughs in basic science

The goals of the three centers are to achieve transformational discoveries in basic science to make production of cellulosic ethanol and other biofuels cost-effective and economically viable. Further information on the Bioenergy Research Centers can be found at <http://genomicsgtl.energy.gov/centers>.



### **XIII. Genomics: GTL – Systems Biology for Energy and Environment**

John Houghton of DOE's Office of Science presented to the Committee an outline of his work with the Genomics: GTL project (formerly Genomes to Life). The mission of the GTL project is to better understand biology through genomics, inspired by DOE efforts in energy, climate, and the environment. Specifically pertaining to biofuels, GTL aims to: develop biofuels as a major secure national energy resource; understand relationships between climate change and earth's ocean and terrestrial ecosystems and assess options for carbon sequestration in these systems; and develop biological solutions for difficult environmental problems.

The presentation described the work of the GTL program as it relates to the application of genomic technology to various stages of bioenergy production. Mr. Houghton also outlined several upcoming solicitations pertaining to bioenergy including: new analytical and imaging technologies for Lignocellulosic Material Degradation, and for Multiplexed Screening for Plant Phenotypes; quantitative microbial biochemistry and metabolic engineering for biological hydrogen production; new genomic strategies and technologies for studying complex microbial communities and validating genomic annotations; and ethical, legal, and societal implications of research on alternative bioenergy technologies, synthetic genomics, or nanotechnologies.

### **XIV. Baseline Biomass Work at U.S. Department of Energy**

Baseline biomass work at DOE's Biomass Program is centered on a few key activities. In response to the food vs. fuel debate, the Biomass Program is actively funding cellulosic ethanol projects. This includes looking at usage of wet feedstocks and the costs associated with harvesting, drying, storage, and building various partnerships with industry.

The Program activities support the RFS set by the Energy Independence and Security Act, and is specifically focused on meeting the 2012 target set by the President for cellulosic ethanol to be cost-competitive with corn ethanol.

The Biomass Program is funding research in both thermochemical and biochemical platform and plans a university solicitation later this year. The biochemical platform has historically received more funding than the thermochemical platform. Much of the Program's research is being performed at NREL. Sustainability continues to be an important priority for the Program and the national laboratory system.

## **XV. Planning Subcommittee Report to Biomass R&D Board**

The Planning Subcommittee report-out outlined several important observations, recommendations, challenges, and priorities facing the bioenergy and biobased products industries for 2008 and beyond. The report was divided into five categories through which it outlined its challenges and recommendations. The categories were: Feedstock Production; Feedstock Logistics; Conversion; Infrastructure and End Use; and Cross Cutting Issues.

Regarding Feedstock Production, the Subcommittee believes the U.S. can achieve the production levels necessary to support the 2012 biofuel production targets stated in the Energy Policy Act. In order to do so however, yield improvements are needed for all feedstocks, and all feedstocks must be considered. Also, sustainability must be addressed, and incentives must be created to encourage farmers to grow energy crops.

For Feedstock Logistics, the report identified important issues to be addressed for harvest and transport; specifically harvesting technology, transportation infrastructure, drying and storage, and workforce availability.

For Conversion, the report advises an increase in the yield of traditional and advanced bio-conversion technologies, and a reduction of the energy intensity required for preprocessing. It also stressed the importance of further development of thermochemical processes for cellulosic feedstocks in addition to biochemical pathways.

The Subcommittee recommended that for Infrastructure and End Use, a strategy and timeline should be established for transitions that allow infrastructure and end use issues to be effectively addressed. This strategy must include inputs from USCAR, Coordinating Research Council, DOE/EPA, and California Air Resources Board. Also, some type of end use adjustment is needed by 2012, e.g. intermediate blends and increase in E85 station and flex-fuel vehicle deployment.

Finally, as Cross-Cutting recommendations, the Subcommittee stressed the need to understand national and global carbon lifecycles and other environmental impacts associated with increased production and use of biofuels. Other cross-cutting recommendations relate to increased emphasis on workforce availability, food vs. fuel issues, and ways to engage states, academia and industry.

## **XVI. Public Comment**

There was no public comment made at the February 2008 meeting of the Technical Advisory Committee.

**Attachment A: Attendees**

**Committee Members Present (21)**

W. Henson Moore (co-chair)  
Gil Gutknecht (co-chair)  
Robert Ames  
Bill Berg  
Bob Dinneen  
Doug Hawkins  
Lou Honary  
E. Alan Kennett  
Charles Kinoshita  
Eric Larson  
Jay Levenstein

Mark Maher  
Tim Maker  
Jim Martin  
Scott Mason  
Mary McBride  
John McKenna  
Shirley Neff  
Mitch Peele  
Rodney Williamson  
Ed White

**Committee Members Not Present (10)**

David Anton  
Thomas Binder  
Ralph Cavalieri  
Scott Faber  
Richard Hamilton

Jeffrey Serfass  
Robert Sharp  
Tom Simpson  
J. Read Smith  
Richard Timmons

**Biomass R&D Board Members Present (1)**

Tom Dorr (co-chair), USDA

**Federal Employees Present (9)**

Ghassem Asrar, USDA-ARS  
Jacques Beaudry-Losique, DOE  
Mary Bohman, USDA-ERS  
Doug Faulkner, USDA  
John Ferrell, DOE

William Hagy III, USDA  
John Houghton, DOE  
Melissa Klembara, DOE  
Reinhold Mann, Oak Ridge National  
Laboratory

**Other Attendees (8)**

Joel Fetter, Booz Allen Hamilton  
Mike Miller, Booz Allen Hamilton  
Ken Hunt, Phosphor Group  
Jeff Eppink, Enegis

Don Erbach, ASABE  
Narasi Sridhar, DNV  
Carolyn Clark, BCS  
Crystal Beasley, BCS

**Designated Federal Officer** – Valri Lightner, DOE

Total Public Attendees - 6

Total Attendees- 40

## Attachment B: Agenda

**Day 1: Crystal Gateway Marriot – Arlington, Virginia**

**February 6, 2008**

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11:45 am – 12:15 pm *Lunch (to be provided)*

12:15 pm – 12:45 pm Welcome  
*Co-Chair, Henson Moore*

- Introduction of New Committee Members
- Partnership Clause

12:45 pm – 1:30 pm Presentation: Updates on the Farm Bill and Energy Act  
*Bill Hagy, Rural Development, USDA*  
*Jennifer Owen, DOE*

1:30 pm – 1:50 pm Presentation: Agricultural Research Service (ARS) Biofuels Activities  
*Ghassem Asrar, ARS, USDA*

1:50 pm – 2:15 pm Presentation: Energy Science, Education and Extension Plan  
*Ghassem Asrar, ARS, USDA for Joe Dunn, REE, USDA*

2:15 pm – 2:30 pm *Break*

2:30 pm – 3:15 pm Presentation: 9008 Awards  
*Bill Hagy, Rural Development, USDA*

3:15 pm – 4:00 pm Discussion: May 2008 Meeting Logistics and Agenda Items

4:00 pm – 4:30 pm Discussion: Approve 2008 Committee Work Plan

4:30 pm – 4:45 pm *Public Comment*

4:45 pm – 5:15 pm Technical Advisory Committee Ethics Training

- 7:30 am – 8:00 am    *Breakfast*
- 8:00 am – 9:00 am    Discussion: Baseline of Biomass Work at USDA  
*Bill Hagy, Rural Development, USDA*
- 9:00 am – 9:45 am    Presentation: DOE Bioenergy Research Centers  
*Patrick Glynn, Office of Science, DOE*
- 9:45 am – 10:30 am   Discussion: Baseline of Biomass Work at DOE/SC  
*John Houghton, Office of Science, DOE*
- 10:30 am – 10:45 am   *Break*
- 10:45 am – 11:45 am   Discussion: Baseline of Biomass Work at DOE/EERE  
*Melissa Klembara, John Ferrell, Biomass Program, DOE*
- 11:45 am – 12:15 pm   *Working Lunch (to be provided)*
- 12:15 pm – 1:15 pm   Planning Subcommittee Report
- 1:15 pm – 1:30 pm    Public Comment
- 1:30 pm                *Closing Remarks/Adjourn*

## **Attachment C: Meeting Presentations**