

Meeting Summary:

**Biomass Research & Development
Technical Advisory Committee**

May 20-21, 2008

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I. Purpose

On May 20-21, 2008 the Biomass Research and Development Technical Advisory Committee (Committee) held its second quarterly meeting of calendar year 2008. The purpose of the meeting was to hear updates from the Departments of Agriculture and Energy on agency activities related to the Biomass Initiative, receive an update on the Farm Bill and FY 2008 joint USDA-DOE solicitation, and to discuss FY 2008 annual recommendations. The Committee also heard presentations from POET on the future state of cellulosic biofuels and received an update on the Biomass R&D Board activities from Under Secretary for Rural Development of the U.S. Department of Agriculture, Tom Dorr. The Committee toured the POET ethanol plant in Coon Rapids, Iowa and was briefed by the Pioneer Company on advancements in seed genetics and crop efficiencies. Finally, the Committee toured the Biorenewables Laboratories at Iowa State University to view first-hand the university's efforts in thermochemical conversion of biomass. The two-day meeting was held at the Iowa Corn Promotion Board in Johnstown, Iowa.

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.

II. Update on Biomass R&D Board Activities

Tom Dorr, Under Secretary for Rural Development at the U.S. Department of Agriculture, presented an update on Biomass R&D Board (Board) activities. Dorr informed the Committee that the issue of sustainability has been elevated within the Board. The Board's National Biofuels Action Plan has been signed by USDA and at the time of the meeting was awaiting a final signature from DOE. After the Board's National Biofuels Action Plan has been signed by both the Departments of Energy and Agriculture there will be an interagency review.

Under Secretary Dorr indicated that the Biomass R&D Board is committed to building a working relationship with the Committee. The Board would like for the Committee to have subcommittees parallel to the working groups of the Board to facilitate making recommendations to the Board's working groups.

In addition to providing an update on Biomass R&D Board activities, Dorr announced that the Farm Bill has passed the House of Representatives and the Senate, but that the President intended to veto the Bill.

Under Secretary Dorr also discussed the food vs. fuel issue. He spoke of a press conference with Secretary of Agriculture, Ed Schafer, specifically to address the issue and lay out the collective body of work that has studied food vs. fuel. The impact of ethanol on the price of food was

shown to be to a lesser degree than many assume; between 3 and 10 percent of the increase in food could be related to ethanol. Dorr relayed to the Committee that Secretary Schafer also pointed out at the press conference that there were two dramatic increases in food costs in the twentieth century. The first was after WWII when people consciously began to eat more meat, and the second was in the 1970's when foreign demand rose sharply. In both cases, markets soon adjusted and the increase was marginalized. The studies also concluded that ethanol production could be ramped up to 25 million gallons, and food prices would not be heavily impacted.

III. U.S. Department of Agriculture: Overview

Bill Hagy, Deputy Administrator of Business Programs in Rural Development at the Department of Agriculture, provided an update to the Committee on USDA's biofuels efforts. The presentation focused on the Farm Bill and the FY2007 joint USDA-DOE solicitation.

A. Farm Bill

Bill Hagy continued Under Secretary Dorr's discussion of the Farm Bill and addressed how the Farm Bill impacts biomass research and development.

Regarding the Farm Bill, Title IX, the Farm Bill Energy Title is the most relevant to biofuels. This area received the bulk of funding. The Farm Bill includes a Biorefinery Assistance Program, which will provide grants for demonstration and commercial scale projects. Due to the impending change of Administration, USDA must wait on an appropriations bill, and thus will be behind in making the FY09 awards. The Farm Bill appropriates an additional \$245 million in FY10 to be spent over the following three years.

A subsidy level of 15% to 20%, for up to 75% of project costs is anticipated. Congress is working with the Office of Management and Budget (OMB) to solidify the subsidy levels. This is a riskier guarantee than the 9006 program.

Repowering assistance has a designated section in the new bill, and is now a program designed to replace fossil fuel with biofuels at biorefineries. Payments will be made to facilities to do this, but the amounts are to be determined. USDA can send \$35 million to offset costs of retrofitting systems. It was recommended during this discussion that if plants burn the dry distillers grains (DDG's), then there would be a net surplus of energy for a co-generation plant. The excess electricity could be sold.

Section 9006 of the Bill is designed to assist the development of pre-commercial and commercial facilities. The program was expanded since the 2002 farm bill, and now contains a regulatory cap of \$10 million, 75 percent of which can be matched by the Federal Government. Also added are provisions to merge the Section 9005 energy audits portion of the previous bill that was never incorporated.

Section 9008 is revised by the Farm Bill and includes the Biomass Research and Development Initiative (BRDI), under which this Committee is legislated. For the BRDI Joint Solicitation, currently, all funds are allocated to technical areas. In the new model, there will only be 3 technical areas (instead of 4) and only 15 percent of funding for each category is allocated, the remaining 55 percent available is at the discretion of the Secretaries for use. The new funding levels are doubled, and there is \$20 million in mandatory funding in FY2009 and an authorization for an additional \$35 million of discretionary funding.

B. FY 2007 Joint Solicitation Follow Up

Mr. Hagy also talked about the FY2007 joint solicitation. The FY2007 solicitation received 676 pre-applications 144 applications and made 21 awards. Mr. Hagy was asked about awards for forest service applications. He responded that some applications were submitted, but they did not make it through the peer review process. Committee members noted that the lack of forestry-related solicitations may send a message that the government is not interested in forestry work.

USDA has not yet examined FY2007 joint solicitation awards or past awards in detail, although there are systems in place to track the benefits, which will be used in identifying future awards. In the future, USDA plans to receive periodic reports from the awardees.

IV. U.S. Department of Energy: Overview

Valri Lightner of the Office of the Biomass Program (OBP) at the U.S. Department of Energy presented an update on biomass program activities and updates on the FY2008 solicitations.

A. Biomass Program Updates

OBP's current focus is on biofuels, based on goals established by the President. President Bush, in his State of the Union address in 2006, set a goal to make cellulosic ethanol cost-competitive by 2012. The Energy Independence and Security Act (EISA) of 2007 set a renewable fuels standard of 36 billion gallons, 3 billion of which are to be cellulosic, by 2015. It is projected that to be cost competitive, cellulosic ethanol must be produced for \$1.33 per gallon. As of 2007, it was \$2.43. These cost projections are based on estimates from the Energy Information Administration (EIA) and competition in a blending market.

Of the Program's current biorefinery projects, Range Fuels is the only one that has reached phase two (construction). Plans to begin production are for the 2010 timeframe. Three other solicitations are in phase one (finalizing engineering and design), and will not reach phase two until NEPA is complete. Alico Energy and Iogen Biorefinery Partners projects were still in negotiations with the Department at the time of the meeting. Iogen had requested a one-year extension, or a cancellation of the project, and the Department had not officially responded to the request at the time of the meeting.

All of the 10 percent of commercial scale projects are in negotiation with no funds yet awarded. Mascoma Corporation and ICM will work with switch grass. Mascoma switch grass will be grown locally in Tennessee.

Future opportunities at DOE include a pyrolysis solicitation for \$7 million over the next 2 years, and a university solicitation including both bio- and thermochemical conversion R&D. There are also Loan Guarantee programs with funding authorization received in FY2007. The Loan Guarantee program received 143 pre-applications. Of those, 16 were asked to complete full applications, and six were for biomass. No full applications were yet received, and no decisions made.

The program began to evaluate intermediate ethanol blends in 2007, and its goal is to understand the factors associated with intermediate blends. Small engines and vehicles are currently being evaluated, and specialty engines such as marine engines will be studied next year. Intermediate blends are a strategy to meet the step change goals and transition beyond the E10 saturation point.

Sustainability has become an increased area of focus. The work specifically pertains to life cycle issues, land use, water use, and others. OBP is also looking at opportunities to work with the State Department on international sustainability issues.

B. FY 2008 Joint USDA-DOE Solicitation

DOE is working on a draft version of the FY 2008 joint solicitation, but expects the Farm Bill to require changes. There is no USDA funding for the solicitation until a Farm Bill or continuing resolution is passed. OBP hopes to release the solicitation once funding is secured.

V. Subcommittee Updates

Valri Lightner of the U.S. Department of Energy's Biomass Program communicated to the Committee the outcome of the presentation that Bob Dinneen, representing the Planning subcommittee, gave as the subcommittee's report out to the Biomass R&D Board.

Comments from the Biomass R&D Board on the subcommittee's report out included communication that an interagency review process has begun, but the food vs. fuel debate still must be addressed. It was also agreed that technology advancements to enhance the process moving from field to plant (feedstock logistics) must be improved. The issue of feedstock logistics is new to the Action Plan. Looking at other fuels, blends, dispensing, and how to combine efforts to meet the Renewable Fuels Standard (RFS) was also a priority. Workforce issues were added to the Action Plan; specifically, those involving the handling of workforce needs such as training, college/tech school classes, and others. The Board and Subcommittee appear to be in sync with their priorities.

VI. U.S. Department of Agriculture Renewable Energy Budget

Bill Hagy presented on USDA's funding efforts, specifically as it related to the technical recommendations and advice of the Committee. Based on the request of the Committee, the Department is attempting to gather information on all energy investments, Department-wide; which has been a challenge. The 9008 portion of the budget was not included in this auditing effort because the FY2007 appropriations were not awarded until FY2008. Also, USDA's Office of Rural Development did not request funding in FY2008 in anticipation of the Farm Bill. The number provided should rise dramatically in the next fiscal year.

VII. FY2008 Annual Recommendations Discussion

The Biomass R&D Technical Advisory Committee discussed its FY 2008 Annual Recommendations (as required in the Biomass R&D Act of 2000) both on the first day of the meeting and the second day. Recommendations are to be approved by a majority vote of Committee members present at the September 2008 quarterly meeting

On the first day of the May 2008 meeting, discussions among the Committee members first addressed paragraph one of Section 309 of the Biomass R&D Act of 2000, and whether recommendations in that section were heeded.

The Committee felt that all recommendations in Section 309 were considered or acted on except for Provision 1.d, which is a recommendation to fund a balance of biobased materials. Biobased materials, argued members of the Committee, provide a more balanced portfolio, and offer fewer targets to biofuels detractors, as they can no longer criticize only based on the food vs. fuel argument. Among the seven awards made by USDA, none were for biobased products, which did not meet the recommendation of the Committee. The Committee also felt that the distribution of funds by agencies was too prescriptive, and did not allow for maneuverability to act on the Committee's recommendations.

The Committee felt that all recommendations in Sections 306 and 307 of the Biomass R&D Act were acted upon by the Agencies.

A. Subcommittee Structure

On day two of the May 2008 meeting, the Committee continued its discussion of the FY2008 annual recommendations. The Committee decided that it would use the structure of subcommittees parallel to the Biomass R&D Board's interagency working groups as requested by the Board to further draft and polish the FY 2008 recommendations. The subcommittees that were agreed upon would best fulfill this are:

- Feedstocks Production and Logistics

- Conversion
- Infrastructure and End Use
- Sustainability and Environmental Health and Safety.

The Interagency Working Groups are:

- Feedstocks Production
- Feedstocks Logistics
- Conversion
- Infrastructure and End Use
- Blends
- Sustainability
- Environment, Health and Safety.

It was debated whether Sustainability should be included in the Feedstocks subcommittee. Sustainability is broader than just feedstocks, as it cuts across the supply chain. Near term deliverables related to sustainability include the Sustainability Indicators Across the Supply Chain report; which will look at current studies and models, focusing on the food vs. fuel issue.

Members of the Committee also questioned whether Sustainability could also be combined with the Environmental and Safety subcommittee. Both categories extend across all Subcommittees. David Anton felt that a Sustainability subcommittee was needed, but Environmental Health and Safety should be combined with Sustainability. Trying to merge Sustainability across the other subcommittees would not work. Shirley Neff felt that Environmental Health and Safety relates more to Infrastructure and End Use. The Committee decided to combine Sustainability and Environmental Health and Safety, and Eric Larson will chair. This subcommittee will be identified as a 'cross-cutting subcommittee', one that will work on all aspects of the supply chain.

Rodney Williamson proposed the combining of Feedstock Logistics and Production, and volunteered to chair the Subcommittee. Ed White will serve as the co-chair. Regarding Infrastructure and End Use, Tom Binder suggested that the Committee focus on other bioproducts, even if DOE must focus on fuels only. Shirley Neff agreed to chair the Infrastructure and End Use subcommittee.

At the time of the Committee meeting there were only four subcommittees: planning; analysis; policy; and communication.

The Committee debated whether to abolish the policy and communication subcommittees and shift all work to the planning and analysis subcommittees. It was decided to align their subcommittee structure with that of the Board, as mentioned above.

Lou Honary raised the issue of response to recent attacks to the biofuels industry, and how the Committee can assist the effort. Valri Lightner responded that the job of the Technical Advisory Committee is to make recommendations to the Board, and not become involved in public relations.

Valri Lightner informed the Committee that they can communicate with the Board's interagency working groups, but the two parties cannot meet. Only Special Government Employees can attend Board meetings.

David Anton made a motion to formally disband the Communication subcommittee, and the Committee voted affirmatively to disband.

Jim Martin felt that the Analysis subcommittee could be appropriately moved into a subcommittee that aligns with the Board. As the role of the Policy subcommittee was to examine policies outside R&D to examine their effectiveness, it could be moved to any of the new subcommittees. Doug Hawkins proposed that the Analysis subcommittee remain, but not be assigned work unless it cannot be sent elsewhere.

When considering the actual role of the subcommittees, Valri Lightner stated that the subcommittees are not responsible for producing a large list of recommendations. The fewer recommendations there are, the more impactful they will be. Gil Gutknecht requested that the recommendations be as specific as possible, and to exercise caution in their structuring to get the maximum impact.

B. Recommendations Generation

As time permitted, the Committee began going through its draft recommendations by topic area. Under feedstocks logistics, Committee members discussed that in preprocessing, the industry could benefit by doing more in the field. By doing more preparation in the field, the feedstock could be denser and easier to transport.

Scott Mason cautioned that the Committee was becoming too prescriptive in its recommendations. He suggested that recommendations should stay at a higher level to not risk subtracting from the overall message.

Tim Maker observed that when discussing densification, it traditionally only pertains to future biofuels. However, if considered as a way to meet existing energy demands, it becomes relevant to present discussions, avoiding the chicken and egg problem. The acceleration of a densification effort could create a bridge to advanced biofuels.

Lou Honary recommended that some Department funds go to demonstration projects that encompass the all parts of the supply chain; i.e. feedstock logistics. This includes encouraging some research group to team with others to do research. Valri Lightner responded that this would be helpful and that the Committee needs to be specific with its recommendations.

Committee members also encouraged the Departments to look at projects that use woody biomass as the major materials, and study its economic viability.

David Anton stated that the DOE solicitation is a good program, but insufficient. Ed White agreed in saying the solicitation language is correct, but the Department still needs to make a

greater effort to fund woody biomass projects. This builds on the recommendation that all possible feedstocks must be considered.

During the Committee discussion of recommendations related to conversion, Bill Hagy stated that he will continue to gather information on his Department's spending on conversion and other biomass activities.

Jim Martin observed that the Committee made a recommendation two years ago to pursue more robust enzymatic processes to diversify feedstocks. According to the Committee, this still hasn't happened, and better conversion processes that use various feedstocks are needed to give these processes the best opportunity to become economically viable.

VIII. Future State of Cellulosic Biofuels

Mark Stowers of POET gave a presentation on strategies related to cellulosic technology, and the importance of corn and its integration with cellulose. Mr. Stowers discussed the Emmetsburg Plant in Emmetsburg, IA, which does not contain fractionation. The importance of the plant is it is a corn ethanol plant with readily available access to critical infrastructure (railways, roads, an existing labor force, farmers supplying grain, etc.), which makes market access to cellulosic feedstocks easier.

Mr. Stowers discussed Project Liberty, which, partially funded by DOE (\$80 million to construct the facility), is an integrated biorefinery. The facility will eventually produce 125 million gallons of cellulosic ethanol. Also, the plant will be essentially fossil fuel independent, and can better manage water resources than existing plants. The presentation also examined the collection, storage and processing of feedstocks, and examined the energy properties of corn cobs.

IX. Biomass Research and Development Initiative Websites

Carolyn Clark of BCS, Incorporated gave a demonstration of the Biomass R&D Initiative website (biomass.govtools.us) and the Technical Advisory Committee's internal site. The website provides easy access for Committee members and the public to Biomass R&D Initiative documents and information as well as past meeting materials and Annual Reports to Congress. The Technical Advisory Committee can use its internal website as a means to communicate with one another between meetings and to access upcoming meeting materials.

X. Public Comment

Duane Sand, Chair of the Soil Conservation Committee of the Iowa National Heritage Foundation, appealed to the Committee to consider the facilitation of public-private partnerships in order to maximize environmental, social, and economic initiatives. Mr. Sand explained to the Committee that existing conservation agencies do not have resources to perform proper life-cycle

analyses. Conservation agencies are suffering due to budget cuts, losing employees and funds to perform necessary functions, particularly in the area of biomass.

Mr. Sand prepared several options in dealing with the issue. Among them was to appoint soil erosion enforcement personnel, based on a soil loss law. Companies preparing to work in biomass markets could set pricing and procurement policy for land owners, and provide rewards for producers that follow conservation plans. The Soil Conservation Committee is also in talks with companies to promote social responsibility in considering conservation and offering committee assistance. Mr. Sand admitted that these are cruel tools, but effective when operating with a limited budget.

Julis Schaaf, Chair of the Iowa Corn Promotion Board also spoke to the Committee. He lamented that it is unfortunate that at the same time ethanol is being identified as a necessity, oil prices are meeting record highs, resulting in rising food prices. He reiterated that most of the increase in costs is due to the high costs of oil, and is coming from outside the corn industry. There was a short wheat and rice crop throughout the world, due to failures. Corn did not experience such a crop failure. Mr. Schaaf encouraged the Committee not to pull away from corn-based ethanol because it is an infant industry and holds tremendous potential.

Attachment A: Attendees

Committee Members Present (20)

W. Henson Moore (co-chair)

Gil Gutknecht (co-chair)

Jim Martin

Shirley Neff

Charles Kinoshita

Jeffrey Serfass

Edwin White

Timothy Maker

Lou Honary

Rodney Williamson

Jay Levenstein

Thomas Binder

John McKenna

Richard Hamilton

Robert Ames

William Berg

David Anton

Robert Sharp

Douglas Hawkins

Scott Mason

Committee Members Not Present (11)

Ralph Cavalieri

Bob Dinneen

Scott Faber

E. Alan Kennett

Eric Larson

Mark Maher

Mary McBride

Mitchell Peele

Tom Simpson

J. Read Smith

Richard Timmons

Biomass R&D Board Members Present (1)

Tom Dorr (co-chair), USDA

Federal Employees Present (2)

Nathan Brown, DOT/FAA

Bill Hagy, USDA

Other Attendees (7)

Vonnie Estes, DuPont/Pioneer

Roya Stanley, IA Office of Energy Independence

Melissa Schultz, GM (observing on behalf of Mark Maher)

Bob Jungk

Duane Sand, IA National Heritage Foundation

Ryan Stroschein, Air Transport Association

Julis Schaaf, Iowa Corn Promotion Board

Designated Federal Officer - Valri Lightner, U.S. DOE

Total Public Attendees – 5

Total Attendees - 29

Attachment B: Agenda

Day 1:

May 20, 2008

Committee members arriving on Monday night should stay at the Stoney Creek Inn in Johnston, Iowa. A shuttle bus will be provided from the Stoney Creek Inn in Johnston, Iowa to the POET ethanol plant in Coon Rapids, Iowa at 8:00 a.m.

Tour: POET Ethanol Plant, Coon Rapids, Iowa (Optional)

PLEASE NOTE THAT DRESS IS CASUAL FOR THIS TOUR. THERE IS RISK OF DIRT AND DAMAGE TO CLOTHES (TIES, ETC.)

- 8:00 a.m. Shuttle bus leaves the Stoney Creek Inn in Johnston, Iowa to the POET ethanol plant in Coon Rapids, Iowa
- 9:10 a.m. Arrive at POET ethanol plant in Coon Rapids, Iowa.
- Break into three groups for separate tours (30 – 45 minutes)
- 10:30 a.m. Shuttle bus departs POET plant for Iowa Corn Promotion Board in Johnston, Iowa
- 11:40 a.m. Arrive at the Iowa Corn Promotion Board office in Johnston, Iowa
- 11:45 a.m. *Lunch (to be provided)*

Meeting: Iowa Corn Promotion Board, Johnston, Iowa

- 12:30 p.m. – 12:45 p.m. Welcome
Co-Chairs: Henson Moore and Gil Gutknecht
- 12:45 p.m. – 1:15 p.m. Opening Comments and Update on Biomass R&D Board Activities
Tom Dorr, Under Secretary for Rural Development, U.S. Department of Agriculture
- 1:15 p.m. – 2:00 p.m. Presentation: USDA Update
Bill Hagy, Rural Development, U.S. Department of Agriculture
- FY 2007 Joint Solicitation Update and Follow Up
 - Update on Farm Bill
- 2:00 p.m. – 2:30 p.m. Presentation: DOE Update
Valri Lightner, Biomass Program, U.S. Department of Energy
- DOE Biomass Program Updates
 - FY 2008 Joint Solicitation
- 2:30 p.m. – 2:45 p.m. *Break*

- 2:45 p.m. – 3:00 p.m. Subcommittee Updates
- Update on Planning Subcommittee Report Out on National Biofuels Action Plan to Biomass R&D Board
- 3:00 p.m. – 3:30 p.m. Presentation: Update on FY2008 and FY2009 USDA Renewable Energy Budget
Bill Hagy, Rural Development, U.S. Department of Agriculture
- 3:30 p.m. – 4:45 p.m. Discussion: FY 2008 Annual Recommendations
- 4:45 p.m. – 5:00 p.m. Public Comment/Adjourn

Dinner: Pioneer Headquarters

- 5:15 p.m. Shuttle bus departs Iowa Corn Promotion Board for Pioneer Headquarters
- 5:30 p.m. Introduction and Tour of Pioneer
- 6:45 p.m. Dinner at Pioneer Headquarters
- 7:45 p.m. Ethanol, Food and Fuel Panel
Roya Stanley, Iowa Office of Energy Independence
Bill Northey, Iowa Secretary of Agriculture
- 8:30 p.m. Shuttle bus departs Pioneer Headquarters for Stoney Creek Inn

Meeting: Iowa Corn Promotion Board, Johnston, Iowa

7:45 a.m.	Bus departs Stoney Creek Inn for meeting at Iowa Corn Promotion Board office
8:00 a.m. – 9:30 a.m.	Discussion: FY 2008 Annual Recommendations
9:30 a.m. – 10:15 a.m.	Discussion: Responding to Biomass R&D Board Needs and Requests
10:15 a.m. – 10:30 a.m.	<i>Break</i>
10:30 a.m. – 11:15 a.m.	Presentation: Future State of Cellulosic Biofuels <i>Mark Stowers, POET</i>
11:15 a.m. – 11:30 a.m.	Presentation: Biomass Research & Development Initiative Website <i>Carolyn Clark, BCS</i>
11:30 a.m. – 11:45 a.m.	<i>Lunch (to be provided)</i>
11:45 a.m. – 12:15 p.m.	Discussion: September 2008 Meeting
12:15 p.m. – 12:30 p.m.	Public Comment
12:30 p.m.	<i>Closing Remarks/Adjourn</i>

Tour: Laboratory at Iowa State University, Ames, Iowa (Optional)

1:00 p.m.	Shuttle bus departs the Iowa Corn Promotion Board office for Iowa State University in Ames, Iowa
1:45 p.m.	Arrive at Iowa State University for tour of Robert Brown's laboratory
3:15 p.m.	Shuttle bus departs Iowa State University for Stoney Creek Inn/Des Moines International Airport
4:00 p.m.	Arrive at Stoney Creek Inn/Des Moines International Airport

Attachment C: Meeting Presentations