Biomass Research & Development

Technical Advisory Committee

June 23-24, 2010

Meeting Summary

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List of Acronyms

Committee - Biomass Research and Development Technical Advisory Committee
Board - Biomass Research and Development Board
DOE - U.S. Department of Energy
USDA - U.S. Department of Agriculture
CAAFI – Commercial Aviation Alternative Fuels Initiative
Biomass Act - Biomass R&D Act of 2000
CTL - Coal to Liquids
CCS - Carbon Capture and Storage
EPA - Environmental Protection Agency
EU - European Union
RFS - Renewable Fuel Standard
BCAP - Biomass Crop Assistance Program
REAP - Rural Energy for America Program
BRCs - Bioenergy Research Centers
Golden - Golden Field Office
LGP - Loan Guarantee Program
ARRA - American Recovery and Reinvestment Act of 2009
NEPA - National Environmental Policy Act
FFB - Federal Financing Bank
FIPP - Financial Institution Partnership Program
EA - Environmental Assessment
CE - Categorical Exclusion
Farm Bill - Food, Conservation, and Energy Act of 2008
REAP – Rural Energy for America Program
REC - Renewable Energy Committee
NAREEE - National Agricultural Research, Extension, Education and Economics
ATA - Air Transport Association
CAAFI® - Commercial Aviation Alternative Fuels Initiative®
LAX - Los Angeles International Airport

I. Purpose

On June 23-24, 2010, the Biomass Research and Development Technical Advisory Committee (Committee) held its second quarterly meeting of calendar year 2010. The purpose of the meeting was to receive updates and discuss recent activities of the Biomass Research and Development (Board), the U.S. Department of Energy (DOE), and the U.S. Department of Agriculture (USDA). The Committee also heard presentations on the DOE and USDA Loan Guarantee programs, the DOE and USDA Joint Solicitation Process, and an overview of the Commercial Aviation Alternative Fuels Initiative (CAAFI). In addition, the Technical Advisory Committee's Subcommittees provided report-outs from breakout meetings focused on feedstocks, conversion, infrastructure, and sustainability. The one and a half-day meeting was held in Washington, D.C.

A list of attendees is provided in Attachment A and the meeting agenda is in Attachment B. Meeting presentations can be viewed online at http://biomass.govtools.us (click on "Publications").

Background: The Committee was established by the Biomass R&D Act of 2000 (Biomass Act) which was repealed and replaced by Section 9008 of the Food, Conservation, and Energy Act of 2008. The Board was established under the same legislation to coordinate activities across the Federal agencies. The Committee is tasked with advising the Secretary of Energy and the Secretary of Agriculture on the direction of biomass research and development.

II. Update on Biomass R&D Board Activities

Steven Koonin, Under Secretary for Science, DOE
Dallas Tonsager, Under Secretary for Rural Development, USDA

Under Secretary Koonin gave a brief summary of his background for the new Committee members. He started professional life as a theoretical physicist and switched to teaching at CalTech where he was a professor for 20 years before becoming Provost for nine years. In 2004, he joined BP as their Chief Scientist for the development of alternatives and renewables prior to joining DOE in 2009.

Under Secretary Koonin discussed how biomass growth, and the way we use biomass is one way we can positively influence the carbon cycle. He emphasized that we must do a better job meeting the goals we have for food, energy, materials, power and the environment than we have done in the past, including better deployment of biomass activities. He also mentioned the need for the Committee to provide insight and recommendations on technical challenges that can be addressed in the Biomass R&D Joint Solicitation, and general technical advice for DOE and USDA. He opened up the discussion by asking for the Committee's perspectives on what this Committee should be focused on and their thoughts on what the federal government could be doing better.

Jim Martin expressed that the availability of food is really not an issue. There is more than enough food to feed everyone on the planet. The problem is hunger and hunger is very real. We have abundance and that's why we can grow fuel. He also raised the importance of bio-chemicals and the need to find bio-replacements because of our country's heavy reliance on importing petrochemicals. Under Secretary Koonin responded in agreement that transforming the petrochemical industry is certainly a challenge, in large part due to manufacturing. But most difficult is the interface of research and development with deployment. With respect to the food issue, he also agreed and mentioned an analogous situation with oil. The world is not running out of oil. The problem is oil is unevenly distributed, and it is becoming increasingly difficult and expensive to extract.

Craig Kvien asked the Under Secretary what he saw as the different sources of energy for liquid transportation fuels over the next 20 years, including what percent of the reduction in fuel use he saw coming from efficiency. Under Secretary Koonin responded that to solve our energy problems, enhance energy security, and reduce greenhouse gas emissions there are at least seven things we need to do including: improve the efficiency of automobiles; encourage novel vehicle technologies at cost; encourage the gradual electrification of the automobile, paced by the development of batteries; invest in alternative transportation fuels, such as advanced biomass; explore options for co-firing for Coal to Liquids (CTL); for heat and power, there needs to be price signals to stimulate efficiency; place a price on carbon that is predictable and material enough to give signals to industry. If we do that, we'll see coal gets replaced with natural gas, wind energy will grow to 20-30%, more nuclear power will come online, the grid will be revamped with more efficient use of electricity, and we'll see the beginning of Carbon Capture and Storage (CCS).

Mark Maher brought up that a lot of progress has been made with advanced biofuels; however, there is still a need to address infrastructure issues for existing biofuels. Under Secretary Koonin agreed and talked about how this is really an issue of energy transformation versus energy innovation. Ultimately, energy infrastructure is owned by the private sector, and the private sector is focused on making money. We need to make it profitable for the private sector to create the infrastructure that we need.

David Bransby asked what role the federal government has in accelerating collaboration with other countries. Currently, there are a lot of technologies that we don't have here in the United States. How can the government help with technology transfer? Under Secretary Koonin agreed that collaboration with other countries is important. The rest of the world is advancing rapidly in many areas of technology and we need to make sure that policy makers are aware to ensure they have the information necessary so that future legislation might enable technology transfer.

Under Secretary Tonsager discussed USDA's desire to help the biomass industry with businesses plans and feasibility studies to give greater confidence in the projects and help them move forward with financial support. The agency is working to develop the components that will show that this works. Efforts include meeting with the Commodity Future Trading Commission to understand under what circumstances future contracts would be allowed for biomass. Currently, it is a challenge because there are not cash markets. In order to have future contracts there needs

to be a $5 billion cash market for biomass or any other product. In addition, Under Secretary Tonsager has requested USDA's Chief Economist generate an index of what products are positives and negatives for various biomass products.

A copy of the regional roadmap that was released by USDA on June 23rd was provided to the Committee. The roadmap outlined the current state of renewable transportation fuels and USDA's plan to develop regional strategies to increase the production, marketing and distribution of biofuels. USDA intends to examine input costs and income generation potential by region, instead of economic viability.

Today, 87% of gasoline has ethanol blended with it. The Environmental Protection Agency (EPA) expects to issue a ruling this fall about using a blend with 15% ethanol, instead of the current cap of 10%. However, this creates ambiguity for gas station owners about whether they should invest in E10 pumps or E15 pumps. Soon there will be a capacity issue to move fuels into consumer tanks. USDA is looking at how to allow more access and greater flexibility for the consumer. Out of approximately 162,000 fueling stations approximately 2,000 allow you to select your blend level. We need to find a way to make the market bigger and this appears to be a breaking point.

Under Secretary Tonsager also shared USDA efforts to assist with finance. The loan guarantee program comes with high costs, so the Agency is investigating other ways to offer finance more useful for the industry.

Gil Gutknecht raised concerns about wood pellets shipped to the European Union (EU) to burn in power plants, when he lives eight miles away from a power plant and our wood industry is really hurting. He asked Under Secretary Tonsager if there were USDA Rural Development dollars that could be leveraged to ramp up retrofitting coal fired power plants to use wood. Under Secretary Tonsager agreed that there is a need for generation of electricity from existing wood sources. Currently, USDA is doing research about how much wood could be used in an existing plant without having mechanical problems. The U.S. has 15 million acres of dead trees from bark beetle infestations, an enormous resource opportunity. The problem is typically the volume, accessibility, and transportation of the volume.

Mark Maher asked about E15 and incentivizing blender pumps. Under Secretary Tonsager responded that he has given it a lot of thought and spent time observing groups and states to see how they are approaching the issue. The cost of a blender pump is $25,000. The large part of the challenge tends to be with the tanks because they must be dedicated ethanol tanks only which drives up the cost to near $100,000. Mr. Maher added that if the objective is to give some relief to the ethanol industry the immediacy of blender pumps is very real. Under Secretary Tonsager mentioned that USDA is looking at resources and what Congress will and will not help fund. He added that it is not about building more plants; it is about growing the market so we can build more plants.

David Bransby requested USDA help support consumer education and consumer awareness. Under Secretary Tonsager agreed with Mr. Bransby and added that everyone should be helping with the consumer awareness effort. That you spend more energy making biofuels than you get

out of using them, or that biofuel crops are taking food out of the supply chain, are myths that are still out there and must be addressed.

III. USDA Update

Bill Hagy, Bioenergy Program, Rural Development, U.S. Department of Agriculture

Bill Hagy gave the Committee an update on recent activities at USDA. He talked about the importance of the Biofuels Interagency Working Group and discussed a report that USDA would be releasing regarding its efforts to accomplish the Renewable Fuel Standard (RFS) by 2022. Most of USDA's research will be focused on second and third generation biofuels; however, they still support first generation efforts. Part of the Biofuels Working Group announcement made on May 5, 2009 by President Obama was to have the following programs funded within 30 days: Biorefinery Assistance Loan Guarantee Program, Repowering Assistance Program, Bioenergy Program for Advanced Biofuels, Biomass Crop Assistance Program (BCAP), and the Rural Energy for America Program (REAP).

In addition, Mr. Hagy updated the Committee on USDA efforts for farmers and ranchers including the BCAP. USDA held a public meeting in Hawaii, because Hawaii has the highest energy costs in the country, and asked what the biggest challenges were to growing energy crops. Farmers at the meeting said they needed to see long range purchasing agreements and guaranteed minimum prices. BCAP could be helpful in establishing the crops and harvesting and storing them, but farmers are looking to USDA for crop insurance and other safety net needs. Another meeting was held with small and disadvantaged farmers in South Carolina where they heard the same concerns as those in Hawaii. The proposed rule for BCAP has closed. USDA was soliciting comments on raising, harvesting, storing, and transporting energy crops. They received approximately 26,000 comments and are planning to issue a final rule sometime this fall.

Jennifer Holmgren asked about loan guarantees and the requirement that the production facility be located in a rural location. She emphasized that jobs come from growing feedstocks not from the production location. Mr. Hagy responded that because the program is administered by Rural Development, a policy decision was made to administratively restrict eligibility to facilities located in rural areas to be consistent with other rural development programs that have a statutory mandate for the facilities to be located in a rural area. He did mention that this policy is under consideration at the Department.

Jay Levenstein asked if USDA had an analysis of geographic areas where USDA money is being awarded. Mr. Hagy responded that USDA is moving in the direction of giving rural development states offices allocations of funding where completion only will need to occur within the state for the available allocated funding.

Steve Briggs asked why USDA was still funding grain ethanol since he thought it was a mature technology. Mr. Hagy responded that USDA will continue to fund first generation biofuels facilities that are determined to be feasible and have a dependable off take arrangement. He further indicated USDA will continue to provide financial assistance for existing first generation

biofuel facilities that need retooling. Rodney Williamson mentioned that corn is mature, but there are still advancements with technical improvements that can be made with corn.

IV. SC/NIFA Joint Solicitation

Dr. Catherine Ronning, Plant Feedstock Genomics for Bioenergy Program, U.S. Department of Energy

Dr. Catherine Ronning gave an overview of the Plant Feedstock Genomics for Bioenergy joint competitive grants program that started in 2006 between USDA and DOE. The joint program was started because genomics-based research is leading to the improved use of biomass and plant feedstocks for the production of fuels including: yield; water and nitrogen use efficiency; increased understanding of carbon portioning and nutrient cycling in feedstocks; enhanced fundamental knowledge of structure, function, and organization of feedstock plant genomes, and efficient plant breeding or manipulation for such use.

Between 2006 and 2009 the Joint Solicitation has funded 37 projects with 28 still active and a total investment of $30.3 million for the following feedstocks: Poplar, Rice, Medicago, Miscanthus, Foxtail millet, Sunflower, Sorghum, Prairie cordgrass, Switchgrass, Maize, Brachypodium, and Resource Development. The 2010 portfolio includes nine projects with an $8.98 million investment in: Populus, Soybean, Maize, Sorghum, Small RNAs, Switchgrass, Plant-microbe interactions, Brachypodium, and Rhizosphere.

The research is producing results. Dr. Ronning presented a number of exciting findings through research funded by these grants. The resource development and basic research of grass cell wall genes has resulted in characterization of grass cell wall gene functions which will translate to improved biomass yield and quality in grass bioenergy species. The basic research on the sorghum lignin biosynthetic pathway has resulted in the identification of the gene encoding the major sorghum lignin biosynthetic protein. This will greatly facilitate development of new strategies for the conversion of grass feedstocks to biofuels.

Jim Martin asked if it would be more cost effective to look at organisms that will do the ultimate conversion for the lignin and the sugars and focus on improving those rather than focusing on the feedstocks. Dr. Ronning responded that DOE does fund projects at the Bioenergy Research Centers (BRCs) that take that approach. While commercialization is the ultimate goal, it is important to look at a lot of different avenues to see what is going to work. The work we are funding is going to produce a lot of new results.

David Bransby brought up altering composition, rather than yield. However, yield is the most important consideration for economic return. Dr. Ronning said that there are a variety of projects and some are examining factors that influence yield such as water and nitrogen efficiency and sustainability factors.

Todd Werpy asked about the difficulty in the separation of lignin. Cellulose or hemicelluloses are more uniform in structure, but lignin is much different. He asked if they had seen a more homogenous type lignin in their research. Dr. Ronning said research on lignin and

phenylpropanoid synthesis has shown that altering certain genes can alter lignin composition and plant fitness. The BRCs do additional research in this area.

V. DOE/USDA Joint Solicitation Process

Carmela Bailey, National Program Leader, Agricultural Materials USDA National Institute of Food and Agriculture

Carmela Bailey gave an overview of the Biomass Research and Development Initiative joint solicitation process. This year the joint solicitation will be providing $33 million in funding. Three technical areas must be integrated into the application including: feedstock development, biofuels and biobased products, and biofuels analysis. Applicants are also required to involve a consortium of institutions, disciplines, and technologies. The funding range for a selected project will be between $3 and $7 million. USDA and DOE are taking a special interest in small scale gasification and pyrolysis research, development and demonstration projects, local-scale woody biomass-to-energy, including generation of electricity and useful heat; and biobased products, with demonstration of biobased products. Final selections will be based on the highest ranked proposals and program policy factors.

Gil Gutknecht asked if the Golden Field Office (Golden) was responsible for setting up criteria and reviewers. Ms. Bailey responded that Golden will handle logistics for the joint solicitation, however, the criteria was developed by USDA and DOE. Mr. Gutknecht followed up with a question about how reviewers are selected. Ms. Bailey mentioned that there is a large database of experts and that they choose reviewers who are experts in feedstock production, conversion technologies, handling, processing, transportation and analysis.

Jay Levenstein asked whether the recommendations made by the Committee are incorporated into the solicitation. Ms. Bailey responded that the recommendations are taken into consideration when the annual solicitation is drafted.

VI. DOE Loan Guarantee Program

Peter O'Rourke, Loan Guarantee Program, U.S. Department of Energy

Peter O'Rourke gave an overview of the DOE Loan Guarantee Program and the application process. The DOE Loan Guarantee Program (LGP) is designed to provide financing to commercial-scale innovative renewable energy technologies that avoid, reduce or sequester anthropogenic emissions of greenhouse gases and air pollutants. The LGP was started as part of the Energy Policy Act of 2005 to help finance nuclear power plants and was modified by the American Recovery and Reinvestment Act of 2009 (ARRA) to include commercially viable renewable energy projects. In order to receive funding, each project must comply with the National Environmental Policy Act (NEPA) which requires Federal agencies to assess the environmental impact of all major Federal actions significantly affecting the quality of the human environment.

The following are highlights of how the LGP operates:

- The LGP requests applications by issuing technology specific solicitations
- A loan guarantee cannot exceed 80% of total project costs
- An equity commitment is required of all projects
- For a 100% DOE guaranteed loan, the loan must be disbursed by the Federal Financing Bank (FFB)
- Interest rates on FFB loans will track the U.S. Treasury's H.15 Constant Maturities rate plus a spread of 25-75 basis points
- The length of the loan guarantee may not exceed the lesser of 30 years or 90% of projected useful life of project assets.

Currently, there are two active solicitations. The first is for Innovative Technologies (DE-FOA-0000140) that include new or significantly improved technologies for solar, wind, hydropower, geothermal, energy efficiency, advanced transmission and distribution, or biomass projects. The applications for this solicitation are submitted directly to the LGP by the project sponsor and evaluated on a competitive solicitation. The Financial Institution Partnership Program (FIPP) for Conventional Renewable Energy Generation Projects (DE-FOA-0000166) is for renewable energy systems, including incremental hydropower that generates electricity or thermal energy by using "commercial technology." Applications are submitted by the lead lender and are accepted on a rolling basis.

The application process has five areas. Part I is the innovation and commercial readiness review. This requires the project sponsor to provide an overview of the process. Essentially, the LGP is checking eligibility requirements for the solicitation are met. Part II includes a detailed technical and financial review of the project. The due diligence phase is conducted by DOE in conjunction with third party engineering, market and legal counsel. Conditional commitment establishes conditions precedent by DOE prior to closing. Finally, the closing phase is entered once all conditional precedents are met by the project sponsor.

There are two main factors for the review. The first is technical and the LGP is looking for: relevance and merit, applicant capabilities, technical approach and work plan, and environmental benefits. Secondly, the financial review examines: creditworthiness, construction factors, and legal and regulatory factors. DOE must collect 3 non-refundable fees from the applicant to cover administrative expenses.

Regarding biomass projects, DOE would like to see a detailed plan by the project sponsor for mitigating market risk and providing DOE with a reasonable assurance of repayment of the loan. The preferred option is through firm fixed price, long-term off-take contracts or power purchase agreements with creditworthy customers. If these contracts are unavailable, project sponsors should provide significantly more equity to their project and maintain significantly higher debt service coverage ratios. The project sponsor should present other credit enhancements in their project to mitigate market risk, for example: feedstock contracts, offering reasonable supply and price certainty, tax equity to pay down debt, parent credit guarantees, or commodity price reserves.

David Bransby asked what the non-refundable fees are used for. Mr. O'Rourke responded that the fees are used to pay for the administration of the program. Gil Gutknecht asked how long the

process takes. Mr. O'Rourke said it depends on two factors: NEPA and FIPP. In regards to NEPA, it depends on whether the project requires an Environmental Assessment (EA) or qualifies as a Categorical Exclusion (CE). A CE will be approved more quickly, usually between six and nine months. FIPP tends to be quicker since DOE is not doing the underwriting of the loan.

VII. USDA Loan Guarantee Program

Anthony Crooks, USDA, Rural Development

Tony Crooks gave an update of the financial assistance provided by USDA. Through the Food, Conservation, and Energy Act of 2008 (the Farm Bill), USDA Rural Development is providing financing for innovative first of a kind commercial scale projects. The Rural Development program supports and administers over 40 programs and manages a portfolio of $114 billion.

The Section 9003 Biorefinery Assistance Program provides loan guarantees of up to $250 million for the development, construction, and retrofitting of commercial-scale bio-refineries that produced advanced biofuels. The funding is largely mandatory from the Farm Bill. USDA has awarded three loans for biomass facilities. Range Fuels was awarded $80 million January 2009 in conjunction with DOE. SoyMor was awarded $25 million June of 2009; however, the lender withdrew from the project shortly after the guarantee was awarded. Finally, Sapphire Energy received $54.5 million December 2009 as a joint effort with DOE. USDA received 17 applications, but had to return 10 applications as incomplete because no lender was included on the application. USDA requires that the lender submit the application.

The Section 9007 Rural Energy for America Program (REAP) is a grant and loan guarantee program designed to assist agriculture producers and rural small businesses. A producer or company can apply for a loan guarantee of up to $25 million or for a grant up to $500,000 or 25 percent of total project costs. This program funds renewable energy systems and energy efficiency improvements. Renewable energy systems include those that generate energy from wind, the sun, biomass, geothermal sources, or that produce hydrogen from biomass or water using renewable energy, and ocean and hydroelectric source technologies. Energy-efficiency projects typically involve installing or upgrading equipment to significantly reduce energy use. Energy audits and feasibility studies are also eligible for assistance. Eligible applicants for energy audits include State, tribe, or local governments; land-grant colleges and universities; rural electric cooperatives; and public power entities. Eligible applicants for feasibility studies include rural small businesses and agricultural producers.

Stephen Long asked about the expense involved with the investment in third generation algal fuels. He brought up the possibility of $20-$30 per gallon and questioned it as a source for large scale production. Mr. Crooks admitted that it will be expensive, but it's a first of a kind facility and first of a kind facilities will cost more. Ms. Lightner, of the Biomass Program, mentioned that the project is working to validate assumptions about where we think the technology is at. The Biomass Program is committed to working over the next year to further develop the status of the algal biofuels industry.

VIII. National Agricultural Research, Extension, Education and Economics Update

Carol Keiser-Long, Renewable Energy Committee Chair

Carol Keiser-Long gave an overview of the recommendations of the Renewable Energy Committee (REC) of the National Agricultural Research, Extension, Education and Economics (NAREEE) Advisory Board. The recommendations were in draft form and ready to be sent to Secretary Vilsack and then to Congress.

REC future plans include: engaging new committee members, attending various regional energy meetings, and assessing the scope and effectiveness of USDA's Research, Education and Economics program.

Eric Larson asked a question about the first recommendation that questioned the sustainability of cellulosic feedstocks. Ms. Keiser-Long responded that research has been underway for a number of decades on cellulosic feedstock production, yet it's uncertain which cellulosic feedstocks are sustainable. REC is requesting USDA validate what cellulosic feedstocks will work in various regions of the U.S.

Steve Briggs asked a follow up question regarding POET and their commercial scale facility that is using cellulosic feedstocks. Ms. Keiser-Long said the Committee needs to evaluate the operation relevant to sustainability. Laura McCann added the Biomass Program is working with many of their integrated biorefinery partners to identify sustainability data that is or could be collected from those projects.

IX. Subcommittee Report-Outs

The four Subcommittees met to continue discussions around their 2010 recommendations to the Secretaries of Energy and Agriculture.

A. Feedstocks

Rodney Williamson, Iowa Corn Promotion Board
Ed White, SUNY

Rodney Williamson and Ed White, co-chairs of the Feedstocks Subcommittee, presented draft recommendations as discussed in the Subcommittee's earlier breakout session. These recommendations concerned:

- Woody Biomass
- Indirect Land Use
- Environmental, Economic and Social Impacts
- Food and Feed
- Productivity
- MSW

- Algae as a feedstock
- Market mechanisms for feedstocks

Todd Werpy asked if anyone has done a comprehensive economic study of algae? Laura McCann responded that the Biomass Program hosted an algae workshop last winter and will be releasing an Algae Roadmap. Mr. Werpy followed up that it is important to understand the potential economics and technology before making further investments.

B. Conversion

Eric Larson, Princeton University

Eric Larson, co-chair of the Conversion Subcommittee, presented draft recommendations as discussed in the Subcommittee's earlier breakout session. These recommendations concerned:

- International technology
- Separations technologies
- Data accessibility
- Scale of supply/conversion systems
- Additional RFS Pathways
- Biopreferred program
- Merit Review Process

Steve Briggs asked why the merit review process came up during the conversion subcommittee meeting. Eric Larson responded that there were two integrated biorefinery projects that were not selected for funding and the Subcommittee wanted a better understanding of the process and who was reviewing.

C. Infrastructure and End Use

Mark Maher, General Motors

Mark Maher, co-chair of the Infrastructure and End Use Subcommittee, presented draft recommendations as discussed in the Subcommittee's earlier breakout session. These recommendations concerned:

- Market Creation
    - General Approach
    - Vehicles
    - Non Vehicle End Use Devices
    - Fuel Blends and Distribution
    - Fuel Blend Pricing
    - Post Bio-Refinery Infrastructure
- Biopower

D. Sustainability

Jim Martin, Omni Tech International

Jim Martin, chair of the Sustainability Subcommittee, presented draft recommendations as discussed in the Subcommittee's earlier breakout session. These recommendations concerned:

- Market/Economic Sustainability
- Lifecycle Analysis
- Water Use/Quality
- Resource Conservation
- Social Sustainability

X. Commercial Aviation Alternative Fuels Initiative (CAAFI)

John P. Heimlich, Vice President and Chief Economist, Air Transport Association of America

John Heimlich gave some background on the Air Transport Association of American (ATA) and the Commercial Aviation Alternative Fuels Initiative® (CAAFI). CAAFI® is a coalition of industry, academic and government stakeholders interested in alternative fuels for the use in commercial aviation. The coalition has specific criteria regarding alternative fuels for aviation. These four criteria are feedstock- and technology-neutral and include: safety/fuel quality, supply reliability, cost competitiveness, and environmental benefit. Efforts to date have focused on overcoming the challenges posed by each of these criteria in order to facilitate commercial deployment.

The CAAFI teams have undertaken a number of cooperative efforts to help accelerate deployment focusing on the following issues: certification and qualification (e.g., jet fuel specs), research and development (e.g., suitable feedstocks and fuels), business and economics (e.g., finance/commercial terms), and environment (e.g., methodologies, case studies).

The U.S. airline industry approach to promoting alternative fuels is to spread the financial risk for airlines and potential suppliers in an effort to accelerate deployment of projects and develop a consistent methodology for greenhouse gas lifecycle analysis. One opportunity to test the industry approach is the agreement reached in August 2009 between eight U.S. airlines and Rentech for renewable synthetic diesel for use in ground support equipment at Los Angeles International Airport (LAX). The Rentech project, based in Rialto, California, applies Fischer-Tropsch technology to urban woody waste. The project, which will produce a small volume of fuel, will be operational by the end of 2012. A second project, with Seattle-based AltAir Fuels, contemplates the production of up to 75 million gallons per year of jet and diesel fuel in Anacortes, Washington, derived from camelina or similar feedstocks using a process known as HRJ, or hydrotreated renewable jet, likely to be certified by ASTM International in early 2011.

Mr. Heimlich concluded the presentation with the following thoughts about the importance of alternative jet fuels for: increasing security of supply from domestic sources, diversifying feedstock sources, meeting our environmental commitments, and lessening volatility associated with petroleum-based jet fuel. He emphasized the potential for a new “jet fuel dynamic,” through which the airlines can reinvent their supply chain and alleviate their dependence not only on crude oil but on conventional refinery economics, which are tied overwhelmingly to gasoline margins.

Eric Larson asked about the plant in Washington State and how it would be financed for capital investment. Mr. Heimlich responded that it cost several hundred million dollars. The plant is

hoping for loan guarantee support and has private investment by a seed builder. The memorandum of understanding with the airlines is a key component in obtaining financing.

XI. Public Comments

No public comments were offered at the meeting.

Attachment A: Committee Member Attendance – June 23-24, 2010 Meeting

Co- Chairs	Affiliation	Attended?
Gil Gutknecht		YES
Steve Briggs		YES

Members	Affiliation	Attended?
Robert Ames	Tyson Foods	YES
William Berg	Dairyland Power Cooperative	NO
David Bransby	Auburn University	YES
Pamela Reilly Contag	Cygnet Biofuels	YES
Bruce Dale	Michigan State University	NO
Bob Dinneen	Renewable Fuels Association	NO
Joseph Ecker	Salk Institute for Biological Studies	NO
Richard Hamilton	Ceres Inc.	NO
Douglas Hawkins	Rohm & Haas	NO
Dermot Hayes	Iowa State University	YES
Jennifer Holmgren	LanzaTech	YES
E. Alan Kennett	Gay & Robinson Sugar	NO
Charles Kinoshita	University of Hawaii	YES
Craig Kvien	University of Georgia	YES
Eric Larson	Princeton University	YES
Jay Levenstein	Florida Department of Agriculture and Consumer Services	YES
Stephen Long	University of Illinois	YES
Mark Maher	General Motors	YES
Jim Martin	Omni Tech International	YES
Jim Matheson	Flagship Ventures	NO
Mary McBride	CoBank, ACB	NO
Mitchell Peele	North Carolina Farm Bureau	YES
Michael Powelson	The Nature Conservancy	YES
J. Read Smith	Agricultural Energy Work Group	YES
David Vander Griend	ICM	YES
Todd Werpy	Acher Daniels Midland Company	YES
Edwin White	State University of New York	YES
Rodney Williamson	Iowa Corn Promotion Board	YES

Total – 21 of 30 members attended

Attachment B: Agenda – June 23-24, 2010 Meeting

Day 1: June 23, 2010

8:00 am – 8:30 am	*Breakfast (to be provided for Committee)*
8:30 am – 9:30 am	New Member Orientation
9:30 am – 10:15 am	SGE Ethincs Training
10:15 am – 10:30 am	*Break*

Technical Advisory Committee Meeting

10:30 am – 10:45 am	Welcome, Introduction of New Members *Co-Chairs – Gil Gutknecht*
10:45 am – 11:30 am	Presentation: Update on Biomass R&D Board Activities *Board Co-chair Steve Koonin, DOE Under Secretary for Science*
11:30 am – 12:00 pm	Presentation: USDA Update on Biomass R&D Activities *Bill Hagy, Rural Development, U.S. Department of Agriculture*
12:00 pm – 1:00 pm	*Lunch (to be provided for Committee)*
1:00 pm – 1:30 pm	Presentation: SC/NIFA Joint Solicitation (genetics) *Dr. Ed Kaleikau, USDA and Dr. Cathy Ronning, DOE*
1:30 pm – 2:00 pm	Presentation: DOE/USDA Joint Solicitation Process *Carmela Bailey, National Program Leader, Agricultural Materials* *USDA National Institute of Food and Agriculture*
2:00 pm – 2:30 pm	Presentation: DOE loan guarantee program *Peter O'Rourke, Senior Advisor to the Executive Director,* *Loan Program Office, DOE*
2:30 pm – 3:00 pm	Presentation: USDA loan guarantee program *Bill Smith, Rural Business-Cooperative Service, USDA*
3:00 pm – 3:15 pm	*Break*

Subcommittee Breakout Meetings

3:15 pm – 5:15 pm	Breakout: Subcommittees *Feedstocks and Infrastructure*
5:15 pm	*Adjourn*

Day 2: **June 24, 2010**

8:00 am – 8:30 am	*Breakfast (to be provided for Committee)*

Subcommittee Breakout Meetings

8:30 am – 10:30 am	Breakout: Subcommittees *Conversion and Sustainability, EH&S*

Technical Advisory Committee Meeting

10:30 am – 10:45 am	*Break*
10:45 am – 11:00 am	Presentation: NAREEE Update *Carol Keiser-Long, NAREEE Committee Chair*
11:00 am – 12:00 pm	Presentation: Update on Biomass R&D Board Activities *Board Co-chair Dallas Tonsager, USDA Under Secretary for Rural Development*
12:00 pm – 1:00 pm	*Working Lunch (to be provided for Committee)*
12:00 pm – 2:00 pm	Discussion: 2010 Committee Recommendations *Feedstocks, Conversion, Infrastructure, and Sustainability, EH&S*
2:00 pm – 2:30 pm	Presentation: CAAFI *John Heimlich, Air Transport Association*
2:30 pm – 2:45 pm	Public Comment
2:45 pm – 3:00 pm	Closing Comments *Co-Chairs – Gil Gutknecht*
3:00 pm	*Adjourn*