U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

BIOMASS PROGRAM

FEEDSTOCK

2011 Platform Review Report

An Independent Evaluation of Platform Activities for FY 2010 and FY 2011

Review Date

April 6–8, 2011

February 2012

Department of Energy
Washington, D.C. 20585

Dear Colleague:

This document summarizes the recommendations and evaluations provided by an independent external panel of experts at the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Biomass Program's Feedstock Platform Review meeting, held on April 6–8, 2011, at the Doubletree Annapolis Court in Annapolis, Maryland.

All programs in the Department of Energy's Office of Energy Efficiency and Renewable Energy are required to conduct a formal peer review of their project portfolios as a means for enhancing the management, relevance, effectiveness, and productivity of the activities. This report documents the process utilized by the Biomass Program in conducting its fiscal year 2011 Peer Review, the resulting opinions and recommendation from the review panel who was tasked with evaluating the Feedstock Platform, and the Program's response to the results and recommendations. Additional information on the 2011 Biomass Program Peer Review Process—including all presentations and a full compilation of reviewer comments for each of the individual platform review meetings and Program Review meeting—are available on the Program Review website at http://obpreview2011.govtools.us.

The Biomass Program peer review process involves a systematic review of the project portfolios of eight separate technology platforms managed by the Program and a separate meeting where the entire Program was comprehensively reviewed. The Biomass platform reviews were conducted from February through April 2011 in the Washington, D.C., and Denver, Colorado, areas. The platform reviews resulted in the peer review of the Program's projects in applied research, development, and demonstration, as well as analysis and deployment activities. The Program Peer Review, held in June 2011, was conducted to evaluate the Program's overall strategic planning, management approach, priorities across research areas, and resource allocation.

The recommendations and evaluations provided by the expert Peer Review Panels are routinely used by the Biomass Program staff to conduct and update out-year planning for the Program and technology platforms. The review results are considered in combination with other critical project information to result in a complete systematic evaluation of the progress and accomplishments achieved by the individual projects, the platforms, and the Program toward programmatic milestones, project goals, and objectives.

I would like to express my sincere appreciation to the reviewers. They make this report possible, and we rely on their comments to help make project and programmatic decisions for the new fiscal year. Thank you for participating in the 2011 Feedstock Platform Peer Review meeting.

Laura McCann
Technology Manager
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U.S. Department of Energy

EXECUTIVE SUMMARY

Summary from Review Panel

Platform Overview

The U.S. Department of Energy (DOE), Office of Energy Efficiency and Renewable Energy (EERE), Office of the Biomass Program Feedstock Platform staff have demonstrated a high level of collegiality and an intense dedication to the Program and its goals, and staff engagement with the Principal Investigators and other partners appears to be instrumental in the high level of progress made on issues vital to national and Program goals.

The portfolio has been successful in developing and progressing projects that are identifying the major obstacles and potential game changers in the large-scale production and delivery of biomass feedstock. The portfolio is expanding and gaining more robust knowledge for practical supply and logistics of biomass and is specifically developing knowledge from and for large-scale projects needed to meet the significant national production objectives. Coordination with other platforms is also contributing. For example, the focus on sustainability is enhancing production via residue harvesting and other life-cycle related knowledge areas. The development of the depot concept and projects is stimulating progress by requiring practical engineering successes, as well as producing experience of unit operations and its impact on downstream processing needs and steps. Overall the Platform is making good progress toward Program goals and commercialization of large-scale biomass feedstock production and delivery.

Progress

The Platform has made considerable progress in the following areas:

- The Platform now incorporates more projects of different sizes to help understand the impact at all levels and to work toward developing national-level production information.
- The information about feedstock production is stronger in terms of costs, volume, and geographic source, and projects continue to develop similar size-dependent information for the logistics of biomass feedstock.
- Added focus on sustainability is helping plan better production via crop selection, crop residue removal (and other life-cycle related topics), and planning of dedicated energy crop systems.

The variety of projects in terms of their sizes, topics, and degree of progress toward commercialization is producing a synergistic effect by developing information more evenly across science (theoretical), modeling, and experimentation (practical) trials.

The projects are actively addressing barriers for second generation biofuels in areas, such as feedstock mass and quality losses, during storage of baled residues, high-moisture bales, etc.

Gaps

Addressing the following gaps would add considerable value to the Program:

- The opportunities for distributed production of high energy density intermediates are not being addressed. Successful development of these intermediates would help reduce system costs, increase access to stranded biomass resources, and create more local jobs in communities and depots.
- The Platform needs to increase focus on standards development, including the science and engineering research needed to support the development of standards (which would enable trade in biomass and feedstocks through the supply chain); the development of quality assessment methods and equipment to enable testing to standards; and support of or participation with the International Organization for Standardization, more commonly known as ISO, the American Society of Agricultural and Biological Engineers, more commonly known as ASABE, and other recognized organizations who would benefit from Biomass Program support and participation from other DOE technical experts.
- The Platform should explore the potential supply from, and logistics of, capturing and efficiently delivering urban sources of biomass or urban-derived intermediates. These will contribute additional cellulosic supply, as well as address urban waste disposal issues.
- The connection between feedstock supply and conversion is a rapidly changing arena that needs to be constantly explored. Technical issues and opportunities arise at the interface that can help ensure energy efficiency and cost effectiveness. The supply chain and Conversion Platform unit operations appear to be merging in many areas and the platforms should work with this development.
- The Platform should expand its focus on projects that develop feedstock supply chain science, models, and practical engineering experience. There is significant information emerging from both pilot-scale studies and large-volume feedstock supply projects that needs to be developed and supported.

Future Actions

Funding

The Feedstock Platform needs sustained funding for large, recently completed, and/or ongoing projects to assure success and to leverage or simply maintain the value of past commitments [e.g., maintenance of the Bioenergy Knowledge Discovery Framework (KDF)]. The Program needs to provide reliable levels of funding in both the short and long term for ongoing studies related to perennial, dedicated energy crops. Such investment would help reduce uncertainty in that area and would ensure that investments made into field studies would not be wasted. These projects yield credible results only when they can complete full crop-cycle measurements.

Portfolio Changes

The Review Panel does not recommend any substantial changes in the portfolio. Funding levels for a few specific projects are commented on in the following Specific Recommendations section.

Specific Recommendations

Platform Goals

- Recommend clarifying the feedstock sustainability targets: specifically the term "climate target."
- Recommend rebalancing the portfolio for Fiscal Year (FY) 2012, due to the anticipated drop in funding for the Feedstock Production Program.
- Recommend the Program look into projects on paradigm-shifting changes that can improve throughput of feedstock beyond the current projects, which are largely developing incremental improvements.
- Recommend that economic sustainability and social sustainability should receive added focus, including specific metrics.
- Recommend clarifying the part of the portfolio analyzing impacts on aquatic biodiversity. Should include more ecologists and aquatic biodiversity measurements or metrics.
- Recommend that more time and resources be allocated in 2011 and 2012 to the set of regional center concept projects.

Miscellaneous Recommendations

- Recommend that the project and the Program consider whether the **Optimization of SE Forest Biomass Crop Production** project [1.7.1.5] is adequately funded, given the very ambitious experimental goals.
- Recommend that all projects be encouraged to report those hypotheses, premises, and expectations that proved not to be true in appropriate literature. [The industry tends not to publish negative results, but this knowledge needs to be passed forward.]
- Recommend a good survey topic relevant to these topics: establishment and crop failures are important lessons to the exploration of risk factors and potential issues with the rate of adoption of new species and cropping systems, therefore broader studies with more test sites will be needed to obtain crop risk measurements from either natural experiments at fields of early adopters or at plot- and field-scale controlled experiments. [from 1.1.1.1]
- Recommend including in the Program, or at least within a project, consideration of how growing advanced bioenergy feedstocks will affect the outflow of nutrients into the Gulf of Mexico. The Program should probably collaborate with the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force.
- Recommend that crop risks due to weather events should be incorporated in production and economic analyses across the Platform.

Process Demonstration Unit Development

- Recommend the Program consider creating an annual capital fund or other mechanism to competitively award innovators, equipment manufacturers, and DOE contractors with funds necessary to either add new modules based on their technology or to add components and upgrades to showcase and collect operational data.

Modeling

- There is an ongoing need to ensure competent calibration and use of models for sustainability, feedstock supply analysis, and other processes. There is also a need to ensure that scenarios and assumptions used in modeling and cost analyses are subjected to sensitivity analysis.
- Recommend a stronger link for outputs be made explicitly with key developers of supporting data—access to modeled forecasts of the report via the KDF, cropping systems, etc., will proactively help researchers to fine tune estimates.
- Recommend DOE should promote collaboration and knowledge sharing between Soil and Water Assessment Tool (SWAT) modelers for projects funded by DOE.
- Recommend caution on the heavy reliance on SWAT throughout the Sustainability Platform. The Spatially Referenced Regression On Watershed (SPARROW) model might be a good complement.
- Recommend modelers be asked to compare their results back to relevant findings of the 2005 study, *Biomass as Feedstock for a Bioenergy and Bioproducts Industry: The Technical Feasibility of a Billion-Ton Annual Supply*, commonly referred to as the 2005 *Billion-Ton Study* or the *BTS*, as a common reference point.

Long-Term Studies

- Recommend that the Program requires early and regular communications of field results to modelers (SWAT, The Eastern Pacific Investigation of Climate processes, more commonly known as EPIC, Agro-IBIS, a process-based terrestrial ecosystem model); delays may mean opportunities lost.
- Recommend that the Program develops plans and procedures to support large communities of users who may develop over time for the projects like **Land-Use Change Modeling, Soil Carbon, Greenhouse Gases (GHG), and Water (H_2O) Analysis** or the **KDF**. If these modeling platforms and databases are accepted and adopted across scales and users, then large scale support will be urgently needed.

Relevance of Some Projects to Platform/Program

- Recommend that the Program consider that this project, **Council on Sustainable Biomass Production (CSPB)**, is not a scientific study nor a field test, that the criteria for evaluation of the other projects are not entirely applicable to this project, and that the project is not totally relevant to the Program's goals. Recommend the Program reconsider whether federal dollars (DOE's or other agencies') should be used to develop third-party standards that are intended to provide a business case (i.e., profit) for that third party; voluntary certification is very relevant to expansion of industry, but it is not clear what DOE's role in this project should be. For example, a federal policy requiring biomass projects to be certified could be one way to establish relevance to the overall Program.
- Recommend that the Program or DOE communicate with Congress that the congressionally directed projects do not meet Program goals.

Standards Development

- Recommend DOE ensure that sustainability research and metrics development incorporate, or are cognizant of, the CSBP work—the Program needs to avoid the perception of conflicting standards and metrics across DOE efforts.
- Recommend that DOE work with the U.S. Department of Agriculture (USDA) or other agencies to develop or promote similar stamps of approval for all agricultural produce, and that the council should work with National Oceanic and Atmospheric Administration (NOAA), which also has a stake given its purview over the coastal oceans.
- Recommend that DOE do more outreach to the U.S. Geological Survey and NOAA on water quality issues.
- Recommend developing a set of standards for equations and modeling at the physical material level to avoid using different units of measurement and equation structures.
- Recommend that the project **Analysis Integration–Idaho National Laboratory (INL)** may provide a forum for the community of feedstock systems and engineering data developers to come together on data standards, metrics, etc.

Communications and KDF Development

- Recommend that the Program host, sponsor, and/or support colloquy, workshops, special focus sessions, and the like at scientific/engineering meetings and industry conferences to assist with technology transfer and peer-to-peer exchange of ideas and information developed in these projects.
- Recommend requiring increased inter-researcher communication during active projects and that DOE-funded projects contribute all data to the KDF within a reasonable period.
- Recommend reviewing whether any data framework efforts similar to the KDF might already exist in USDA to avoid duplication of effort.
- Recommend examining the types of users envisioned for the KDF to make it more relevant to supplier's and field researcher's needs and perspectives.
- Recommend that the Program develop policies on how researchers shall publish results in forums and publications to ensure the copyright allows placing reports, publications, and data sets on the KDF and determine how DOE and/or the Biomass Program will fund the incorporation or administration of user-contributed data in the KDF.
- Recommend that thr Program and the developers make greater efforts to promote the existence of the KDF.
- Recommend that the Program consider the methods used by USDA Forest Service and their Treesearch Web portal to include all Forest Service research and development (R&D) publications back through time in the KDF.
- Recommend it is critically important that upkeep (and resources for upkeep) on the KDF be maintained adequately.

General Use of Biomass

- Recommend that the project and Program consider that, in some cases, the producer does not necessarily grow for, or sell to, the biofuels industry, thus new sustainability standards may or may not have value in most of the marketplace. These other uses alter risk, return, costs, and demand.

Piloting Efforts

- Recommend that the projects/Program should identify growers in each region to pilot standards as a good way to demonstrate to other growers and to iron out initial issues with processes.

Logistics

- Recommend that the costs and benefits of the depot concept as it is scaled to regional areas needs to be better understood.
- Recommend that the whole notion of depots needs its own discussion along the lines that C. Wright suggests. The mass, energy, products, and co-products streams may fundamentally affect decisions to use depot concept, the allocation of costs, capital investments, siting, and revenues to interconnected depot enterprises, products, and markets [from 1.3.1.3/1.3.1.4].
- Recommend that economists be engaged in the logistics work to more fully understand the prices and costs at each transaction in the feedstock supply chain.

Conclusion

The collective contribution of the Feedstock Platform is that assumptions about yield, costs, and logistics methods are being replaced by knowledge, experience, and data. Projects (of all scales from small to large) are concluding, continuing, starting, or being developed and need continued funding to provide the theoretical foundations and practical knowledge to achieve the national biomass delivery goals.

Summary of Results: Platform

Evaluation Criteria	Average	Range	Standard Deviation
1. Relevance	9.2	*8-10*	0.75
2. Approach	8.6	*8-10*	0.80
3. Progress	8.4	*7-10*	1.02
4. Overall Average	8.7	-	-

* Average represents mean of individual reviewer scores. Review Panels did not develop consensus scores.

Summary of Results: Project Portfolio

WBS Number	Project Title; Presenting Organization; PI Name	Final Average Score	Next Steps			Technology Manager Summary Comments
			Continue Project	Continue with Possible Adjustments to Scope	Other	
1.7.1.2	Oakridge National Laboratory (ORNL) Watershed; ORNL; Virginia Dale	8.8	X	-	-	This project will continue to improve understanding of how feedstock and management choices can affect watershed sustainability and how those effects can be measured at a watershed scale.
1.6.1.8	Bioenergy KDF; ORNL; Budhendra Bhaduri	8.7	X	-	-	This project will continue development of a geospatial-temporal knowledge discovery framework for collection, integration, management, modeling, visualization, and dissemination of data, models, and tools for the bioenergy infrastructure.
1.6.1.3	Supply Forecast & Analysis; ORNL; Bob Perlack	8.5	X	-	-	ORNL will continue the refinement of the resource analysis project through the development and improvement in data and integrated modeling of feedstock economics, land-use change, sustainability, and net carbon and GHG accounting.
1.7.1.6	Purdue Watershed; Purdue University; Indrajeet Chaubey	8.4	X	-	-	No additional funds will be provided, but the project will continue through 2012.
8.1.7.3/ 8.1.7.4	Short Rotation Woody Biomass; ORNL; Natalie Griffiths	7.7	X	-	-	This project will continue to provide watershed and operational-scale data on woody biomass production at the extreme of likely conversions and replication of treatment effects across two adjacent watersheds differing in geomorphology.

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WBS Number	Project Title; Presenting Organization; PI Name	Final Average Score	Next Steps			Technology Manager Summary Comments
			Continue Project	Continue with Possible Adjustments to Scope	Other	
8.1.7.2	Land-Use Change p.1; University of Wisconsin; Randy Jackson	7.5	X	-	-	No additional funds will be provided, but the project will continue through 2012.
11.1.1.2	ANL Biomass and Nitrogen; ANL; M. Cristina Negri	7.4	X	-	-	This project will continue geographic information system (GIS) analysis, modeling, and field work on the in-situ capture and reuse of nutrient-enriched water exfiltrating from cropland for the ferti-irrigation of biomass crops in buffer strips.
1.7.1.5	NCSU Watershed; N. C. State University; George Chescheir	7.1	X	-	-	No additional funds will be provided, but the project will continue through 2012.
1.7.1.7	U-Mn Mississippi Watershed; University of Minnesota; Jason Hill	7.0	X	-	-	No additional funds will be provided, but the project will continue through 2012.
8.1.7.1	Land-Use Change p.2; Joint Global Change Research Institute; Cesar Izaurralde	6.7	X	-	-	No additional funds will be provided, but the project will continue through 2012.
6.3.2.20	Council on Sustainable Biomass; Council on Sustainable Biomass Production; John Heissenbuttel	6.5	X	-	-	There are no plans for additional funds to be provided, but the project will continue through 2012.

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Feedstock (Projects displayed are sorted by highest average score.)

WBS Number	Project Title; Presenting Organization; PI Name	Final Average Score	Next Steps			Technology Manager Summary Comments
			Continue Project	Continue with Possible Adjustments to cope	Other	
1.2.1.4	Integration of Advanced Logistical Systems and Focused Bioenergy Harvesting Technologies to Supply Crop Residues and Energy Crops in a Densified Large Square Bale Format; AGCO CORPORATION; Maynard Herron	8.6	X	-	Note: Project end date is 12/31/2012	This project will continue to develop and demonstrate harvest and collection systems that support achieving feedstock supply cost and performance targets.
1.3.1.3/ 1.3.1.4b	Engineering & Fundamentals: Harvest, Collection, and Storage; INL; Kevin Kenney	8.6	X	-	-	This project will continue to develop data and knowledge defining the impact of harvest, collection, and storage operations on material quality.
1.3.1.3/ 1.3.1.4a	Engineering & Fundamentals Preprocessing, Handling, & Transportation; INL; Christopher Wright	8.5	X	-	-	This project will continue developing fundamental data on material quality and performance through preprocessing operations and using that data to support engineering advanced systems.
1.1.1.1b	Regional Feedstock Partnership: Agricultural Residues & Stover Removal Tool; USDA Agricultural Research Service (ARS); Doug Karlen	8.5	X	Project is finishing and will close out by end of 2013	-	The objective of this project is the development of data and tools that guide sustainable agricultural residue removal decisions.

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WBS Number	Project Title; Presenting Organization; PI Name	Final Average Score	Next Steps			Technology Manager Summary Comments
			Continue Project	Continue with Possible Adjustments to Scope	Other	
1.2.1.3	High-Tonnage Forest Biomass Production Systems from Southern Pine Energy Plantations; Auburn; Steven Taylor	8.4	X	-	Note: Project end date is 9/30/2012	This project is focused on development and demonstration of technologies for southern pine energy plantations, with a focus on transitioning to commercial scale.
1.1.1.1a	Regional Feedstock Partnership Overview, Sun Grant; South Dakota State University; Jim Doolittle	8.4	X	Project is finishing and will close out by end of 2013	-	The objective of this project using a multi-institution national network of researchers to establish data, knowledge, and guidelines on local bioenergy crop production.
1.2.1.6	Design and Demonstration of an Advanced Agricultural Feedstock Supply System for Lignocellulosic Bioenergy Production; FDC; Fred Circle	8.3	X	-	Note: Project end date is 12/31/2012	This demonstration project will continue development and implementation of commercial scale equipment optimizing performance of conventional feedstock supply system unit operations.
7.6.2.6	Regional Biomass Feedstock Development Partnership; Sun Grant – South Dakota State University; Jim Doolittle	8.3	-	-	-	The objective of this project is to address feedstock production and logistics research questions at the regional scale through competitive solicitations. No further funding is anticipated.
1.3.1.5	Demonstration of On-Farm Production of a Dedicated Energy Crop incorporating Multiple Varieties of Switchgrass Seed; University of Tennessee; Sam Jackson	8.3	X	-	Note: Project end date is 12/31/2012	This demonstration-scale project will continue to establish commercial-scale switchgrass production and supply systems.

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WBS Number	Project Title; Presenting Organization; PI Name	Final Average Score	Next Steps			Technology Manager Summary Comments
			Continue Project	Continue with Possible Adjustments to Scope	Other	
1.3.1.2	Deployable Process Demonstration Unit; INL; Richard Hess	8.3	X	-	-	This project aims to provide industry, academia, and DOE with a pilot-scale tool for developing, testing, and validating advanced feedstock supply system technologies.
1.6.1.9	Analysis Integration; INL; David Muth	8.3	X	-	-	This project will continue to establish approaches, methodologies, and tools that support integration and standardization of feedstock supply system modeling and analysis efforts.
7.5.4.5	Biorefinery Development Using Multiple Feedstocks; Louisiana State University: Agriculture Center; Don Day	8.2	-	-	-	The objective of this project is to develop systems that take advantage of underutilized capital in sugar cane mills. No further funding is anticipated.
7.1.3.2	Forestry Biofuel Statewide Collaboration Center (MI); MI Economic Development Corp; Donna LaCourt	8.1	X	-	-	The objective of this project is development of a forest-based bio-economy in Michigan through resource assessment, improved logistics, and guideline development. No further funding is anticipated.
1.2.1.2	Development and Deployment of a Short Rotation Woody Crops Harvesting System Based on a Case New Holland Forage Harvester and SRC Woody Crop Header; SUNY ESF; Timothy Volk	8.0	X	-	Note: Project end date is 8/31/2012	This demonstration project is developing a single pass harvest and collection system for short rotation woody crops.

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WBS Number	Project Title; Presenting Organization; PI Name	Final Average Score	Next Steps			Technology Manager Summary Comments
			Continue Project	Continue with Possible Adjustments to Scope	Other	
7.1.2.6	High-Yield Feedstock and Biomass Conversion Technology for Renewable Energy and Economic Development; University of Hawaii; Andrew Hashimoto	8.0	-	-	-	The objective of this project is to determine feedstocks with the greatest production potential in Hawaii and their effect on conversion processes. No further funding is anticipated.
1.1.1.1d	RFSP: Resource Assessment; ORNL; Robin Graham	7.9	X	-	-	This project will continue to develop geospatial analysis tools to support the use of feedstock production data created through the Regional Feedstock Partnership and other collaborative field trials.
1.6.1.1	Feedstock Supply System Logistics; ORNL; Erin Webb	7.9	X	-	-	This project will continue to development fundamental models and relationships for feedstock supply system logistics operations.
1.2.1.5	Development of a Bulk-Format System to Harvest, Handle, Store, and Deliver High-Tonnage Low-Moisture Switchgrass Feedstock; University of Tennessee; Alvin Womac	7.8	X	-	Note: Project end date is 12/31/2012	This demonstration project is developing optimized feedstock supply system configurations for switchgrass.

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WBS Number	Project Title; Presenting Organization; PI Name	Final Average Score	Next Steps			Technology Manager Summary Comments
			Continue Project	Continue with Possible Adjustments to Scope	Other	
1.1.1.1e	The Regional Feedstock Partnership: Herbaceous Energy Crops and CRP Land for Biomass Production; South Dakota State University; Vance Owens	7.7	X	Project is finishing and will close out by end of 2013	-	The objective of this project is the development of dedicated herbaceous energy crops through regionally disparate replicated field trials.
1.1.1.1c	RFSP: Woody Energy Crops; University of Tennessee; Tim Rials	7.6	X	Project is finishing and will close out by end of 2013.	-	The objective of this project is the development of dedicated woody energy crops through regionally disparate replicated field trials.
7.1.1.1	Bioenergy Alliance High-Tonnage Bioenergy Crop Production and Conversion into Conventional Fuels; Texas AgriLife Research; Bob Avant	7.5	-	-	-	The objective of this project is to evaluate energy sorghum production and logistics. No further funding is anticipated.
7.1.2.8	Sweet Sorghum Alternative Fuel and Feed Pilot Project; University of Arizona; Donald Slack	7.3	-	-	-	The objective of this project is to grow and evaluate the economics of sweet sorghum for ethanol production in Arizona. No further funding is anticipated.
1.6.1.2	Feedstock Supply Chain Analysis; INL; Jake Jacobson	7.2	X	-	-	This project will continue to characterize feedstock supply system performance and identify key research needs to meet supply system cost and performance targets.

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WBS Number	Project Title; Presenting Organization; PI Name	Final Average Score	Next Steps			Technology Manager Summary Comments
			Continue Project	Continue with Possible Adjustments to Scope	Other	
7.1.5.11	Alternative Crops and Biofuel Production; Oklahoma State University; Philip Kenkel	6.7	-	-	-	The objective of this project is to develop an integrated model that investigates feedstock production, supply, and conversion for alternative feedstock choices. No further funding is anticipated.
6.5.2.5	China - Biomass Supply Logistics; INL; Christopher Wright	6.3	X	-	-	Held U.S.-China forum on advanced biofuels in September, joint technical scope has been defined and is being executed.
7.1.2.5	Research and Technology Development for Genetic Improvement of Switchgrass; University of Rhode Island; Albert Kausch	6.3	-	-	-	The objective of this project is to develop switchgrass varieties with improved bioenergy performance characteristics. No further funding is anticipated.
7.1.2.9	Second Generation Biofuels: Carbon Sequestration and Life-Cycle Analysis; University of Nebraska-Lincoln; Adam Liska	6.1	-	-	-	The objective of this project is to investigate life cycle impacts of agricultural residue collection for bioenergy. No further funding is anticipated.
7.1.2.10	Saint Joseph's University Institute for Environmental Stewardship; Saint Joseph's University; Clint Springer	3.6	-	-	-	The objective of this project is to establish an institute for environmental stewardship at Saint Joseph's University. No further funding is anticipated.

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INTRODUCTION

On April 6–8, 2011, the U.S. Department of Energy (DOE), Office of Energy Efficiency and Renewable Energy (EERE), Office of the Biomass Program held a peer review of its Feedstock Platform. The Platform Review was part of the overall 2011 Program Peer Review implemented by the Biomass Program. The peer review is a biennial requirement for all EERE programs to ensure the following:

> *A rigorous, formal, and documented evaluation process using objective criteria and qualified and independent reviewers to make a judgment of the technical/scientific/business merit, the actual or anticipated results, and the productivity and management effectiveness of programs and/or projects.*

The results of the Program Peer Review are used by Biomass Program Technology Managers in the generation of future work plans and in the development of annual operating plans, multi-year program plans, and potentially in the redirection of individual projects.

Laura McCann was designated by the Biomass Program as the lead for the Feedstock Platform. In this capacity, she was responsible for all aspects of planning and implementation, including coordinating the Review Panel, coordinating with principal investigators (PIs), and overall planning for the Platform Review. She was assisted in this effort with resources from a peer review implementation team, comprising logistics and peer review implementation contractors and DOE staff from the Golden Office.

Approximately 50 people attended the Feedstock Platform Review meeting. An agenda for the meeting is provided in Attachment 1. A list of attendees is provided in Attachment 2. Presentations given during each of the platform review meetings, as well as other background information are posted on the Peer Review website: http://obpreview2011.govtools.us.

The remainder of this section provides a brief description of the implementation process for the platform review meetings, identifies the Feedstock Review Panel, and describes the role of the Steering Committee.

This report represents the results of the Feedstock Platform Review and evaluation of the Platform and the individual projects in its research portfolio. A separate Program Review Report has been developed following the June Program Review meeting. The Program Review Report may also include additional comments related to this Platform.

Biomass Program Peer Review Process

The Biomass Program followed guidelines provided in the EERE Peer Review Guide in the design and implementation of the platform reviews and Program Peer Review. An outside Steering Committee was established to provide recommendations and help ensure an independent and transparent review process. A description of the general steps implemented in each of the Program Peer Reviews is provided in Exhibit 1.

Neil Rossmeissl of the Biomass Program was assigned by the Biomass Program Manager as the Peer Review Leader. Mr. Rossmeissl managed all aspects of planning and implementation. He was supported by a planning team that comprised staff from the Biomass Program, DOE Golden Office, National Renewable Energy Laboratory Systems Integrator, and contractor support. The planning team held weekly planning meetings beginning in September 2010 to outline the review procedures and processes, to plan each of the individual platform reviews and subsequent Program Review, and to ensure that the process followed EERE Peer Review guidance. The planning activities included input from the following committees:

1. **Biomass Program Internal Peer Review Committee** – To ensure the quality of the process, exchange information efficiently, and communicate meeting and activity specifics throughout the review process, all of the Platform Leads were invited to participate in weekly conference calls involving contractor and DOE Program Review Lead.

2. **Biomass Program Peer Review Steering Committee** – Following EERE Peer Review guidance, a Steering Committee was formed to help ensure an independent and transparent expert review of the Biomass Program's research, development, and deployment (RD&D) portfolio. They serve as a working partner with the Biomass Program and are involved throughout the planning and implementation of the review process, providing comments and direction to ensure the Program receives and publishes calibrated, independent, and transparent project portfolio feedback. Among the specific activities performed by the Steering Committee include the following:

    - Review and comment on evaluation forms and presentation templates
    - Review and comment on overall implementation process
    - Review and comment on candidate review panelists for each platform
    - Review the summary results of the platform reviews and reviewer comments
    - Be present at the overall Program Peer Review, participate as Program Peer Reviewer, and complete required review forms for the Program Peer Review. This includes reviewing the Biomass Program structure, Program management decision-making processes, selection processs, portfolio balance, and progress in achieving Program mission and goals.

Twenty individuals were nominated to be considered for the Steering Committee, with a target of selecting

seven members. In the end, only six Steering Committee members were selected to be on the Committee. Decision criteria included

- Absence of any conflict of interest (COI), as demonstrated by receipt of a signed COI form
- Balanced representation of the diversity of expertise required to support the review process, such as expertise in finance, conversion technology, environmental sciences, or integrated biorefineries
- Balanced representation by type of organization, including research institution, private sector, government, and non-governmental organization.

Final selection was made by the Biomass Peer Review Planning Team and Team Leader. A list of Steering Committee members is provided in Attachment 3. The Steering Committee met through biweekly conference calls, which began in September/October 2010. Committee recommendations were provided to the Platform Review planning teams as they met throughout the planning process.

Exhibit 1 | Basic Steps in Implementing the Biomass Program Peer Review

1. The Program's research, development, and demonstration (RD&D) and Analysis project portfolio was organized by the eight platform areas.
2. A Lead was designated for each Platform Review. The Platform Review Lead was responsible for all aspects of planning and implementation, including coordinating the Review Panel, coordinating with PIs, and overall planning for the Platform Review. Each Platform Lead was assigned contract support resources to assist in the implementation of the associated activities.
3. Each platform identified specific projects for review from its portfolio. Target: Review at least 80% of Platform's total budget.
4. An internal Peer Review Committee (IPRC) comprised of leads of each of the eight platforms, the DOE Program Review Lead, and the Peer Review implementation team was formed to enhance communications, discuss relevant issues and concerns, and insure the quality of the process. Meetings of the IPRC were held weekly
5. A Steering Committee of external, independent experts was formed to provide recommendations for designing and implementing the review and the scope, criteria, and content of the evaluation. Meetings with Steering Committee members were held every two weeks.
6. Draft Project-level, Platform-level, and Program-level evaluation forms were developed for the 2011 Platform Review meetings. Similarly, draft presentation and project abstract templates and instructions were developed. EERE Peer Review Guidelines and previous forms were evaluated in developing the drafts. Separate forms were used for RD&D and analysis projects. The Steering Committee reviewed and modified the forms before they were finalized.
7. Each Platform Lead identified candidate members for the Platform Review Panel. The Peer Review Lead requested Steering Committee feedback of candidate reviewers. Biographies that were available were provided to the Steering Committee for review. The Committee provided yes/no recommendations on candidates, and they recommended other candidates for the platforms to consider. Results were provided to Platform Leads for consideration in the final selection of Review Panels.
8. Upon confirmation, each Review Panel member was contacted by the Golden Office and registered as an individual contractor for the purpose of the Peer Review Process. The Golden Office also communicated important information on their responsibilities, reimbursement procedures, and issues regarding COIs to the reviewers. Each reviewer received COI forms prior to the review meeting; forms were also collected prior to the meeting. A minimum of two conference calls were held for each Platform Review Panel, as well as Peer Review organizers, Golden Office and reviewers to verbally discuss background information on the review, instructions, evaluation forms, presentation templates, and other information pertaining to the Platform Review process. Project lists, abstracts, and presentations were provided to each reviewer in advance of the review meeting via a secure meeting website. To the extent possible, representatives from the Steering Committee participated in those calls.
9. The Biomass Program performed outreach to encourage participation in each of its Platform Review meetings by sending announcements to more than 3,000 Program stakeholders, PIs, and attendees at previous Program events. The Program Reviews were also announced on the Biomass Program website.
10. Platforms invited PIs to present their project(s) at the Platform Review. PIs were provided with presentation templates and instructions, reviewer evaluation forms, and background information on the review process. Conference calls were held with PIs to address questions. PIs who chose not to present received requests to submit forms stating such.
11. Platform Review meetings were held according to guidelines developed by the Steering Committee, IPRC, and the Peer Review Implementation team. Members of the Steering Committee participated in each review to ensure consistency and adherence to guidelines.
12. Review Panel evaluations were collected during each Platform Review meeting using an automated Web-based tool. These evaluations were accessible via a password-protected website following each review, and review panelists had approximately 10 working days to edit and finalize their comments. PIs then had approximately 10 working days to access the review results using the same password-protected website. PIs were also given the opportunity to respond to Review Panel evaluations via the same tool, and all comments are made publically available with the issuing of the final Platform Report.
13. Results of Review Panel evaluations and PI responses were provided to each Platform Review Lead for overall evaluation and response. The compilation of these inputs was then used to develop this report.

Biomass Program Peer Review Meetings

The Biomass Program organizes its research and analysis activities into technology platform areas, and for the purposes of the peer review process, the individual platform review meetings are held, information is processed, platform review comments and scoring outputs are generated, and from this rolled-up information, the Biomass Program is reviewed. The 2011 Biomass Program Peer Review process reviewed eight platforms in three distinct series of meetings held from February through April of 2011. The Peer Review schedule was as follows:

Series 1 Peer Review Meetings, held February 1–3, 2011:

- Integrated Biorefinery
- Infrastructure

Series 2 Peer Review Meetings, held February 14–18, 2011:

- Biochemical Conversion
- Thermochemical Conversion

Series 3 Peer Review Meetings, April 4–8, 2011:

- Analysis
- Sustainability
- Feedstock
- Algae.

The eight platform review meetings focused on the technical project-level reviews of the research projects funded in each of the eight Biomass technology platform areas. The overall structure and direction of the Platform was also reviewed. A separate Review Panel and a designated lead review were selected for each platform review. Review Panels were comprised of independent, external, technical reviewers with subject matter expertise related to the platform being reviewed.

The Program Review was held June 27–28, 2011. This allowed sufficient time to complete and verify the gathering of reviewer comments and to process comments and scoring outputs for use by the Program reviewers. At the Program Peer Review, an independent, external panel evaluated the strategic organization and direction of the Biomass Program, using the results of the platform reviews and presentations from the Platform Leads and lead reviewers as input. The Biomass Program Review Panel comprised six members of the Steering Committee and the lead reviewer from each of the eight platform Review Panels.

Feedstock Platform Review Panel

Each platform portfolio was reviewed by a Review Panel of experts from outside the Program. The purpose of the Review Panel is to provide an objective, unbiased, and independent review of the individual RD&D or analysis projects, as well as the overall structure and direction of the Platform. Laura McCann, the Biomass Program lead for the Feedstocks Platform, designated Dr. Jim Dooley—a national recognized expert in agriculture, forestry and natural resources—as the Lead Reviewer for the Peer Review Panel. Dr. Dooley was responsible for coordinating Review Panel activities, ensuring independence of the Panel, overseeing the production of the Platform Review Report, and representing the Panel at the Program Peer Review in June.

In forming its review panel, the Feedstock Platform evaluated nine candidates. Candidates were evaluated based on their subject matter knowledge in the technology platform area, willingness to commit the time and energy needed to serve on the panel, and absence of COI, as represented by receipt of their COI forms. An outside, objective Steering Committee established to help ensure the independence and transparency of the overall peer review process reviewed available biographies for review panel candidates during the planning process and provided feedback. Platform Review planning teams considered the Steering Committee feedback in making final decisions on its review panel. Exhibit 2 lists Review Panel members for the Feedstock Platform.

Exhibit 2 | Feedstock Review Panel

Name	Affiliation/Title	Expertise
Jim Dooley*	Forest Concepts, Co-Founder & Chief Technology Officer	Logistics
Marilyn Buford	U.S. Department of Agriculture (USDA) Forest Service, National Program Leader for Silviculture Research	Production
Randy Bruins	U.S. Environmental Protection Agency, National Exposure Research Laboratory	Modeling
Richard Hegg	USDA National Institute of Food and Agriculture, National Program Leader, Agricultural Engineering	Logistics
Sylvie Brouder	Purdue University, Professor of Agronomy	Production
Bruce Dale	Michigan State, Professor in the Department of Chemical Engineering and Materials Science	Production

* Denotes Lead Reviewer

Additionally, a number of projects fall under the Feedstock Sustainability Sub-Platform, and these projects (presented on April 6, 2011) were reviewed by Review Panel members from the Sustainability Platform. The reviewers were P.T. Vasudevan, Libby Jewett, Alison Brady, and Theresa Selfa. See the 2011 Sustainability Platform Review Report for more information on these reviewers.

Organization of this Report

The remainder of this document provides the results of the Feedstock Platform Review meeting, including:

- Results of review panel comments on the overall Feedstock Platform
- The Biomass Program Feedstock Platform Technology Manager response to Review Panel comments and discussion of next steps for each project
- General results information processed from Review Panel comments on projects evaluated during the Platform Review
- Additional information, which includes the full compilation of Review Panel comments on projects evaluated during the platform review and PI responses to reviewer evaluations for their projects, can be found in a compendium document.

PLATFORM OVERVIEW AND EVALUATION

Platform Overview

Platform Goals and Objectives

The Biomass Program's Feedstock Platform seeks to develop sustainable technologies to provide a secure, reliable, and affordable biomass feedstock supply for the U.S. bioindustry, in partnership with USDA and other key stakeholders.

Goals of the Feedstock Platform:

- Validate the availability of a sustainable, high-quality feedstock supply of 130 million dry tons per year by 2012, growing to 250 million dry tons per year by 2017.
- Reduce feedstock costs to $50.70 per dry ton (2007 dollars) by 2012. This target includes $35 for logistics costs and $15.70 for a grower payment.

Sub-Platform Areas and Major Milestones

The Feedstock Platform is divided into 4 sub-platform areas: Resource Assessment, Production, Logistics, and Sustainability.

Resource Assessment

Feedstock Platform-related analyses focus on biomass resource assessment and supply forecasts and sustainability and environmental impacts (along with the Sustainability Sub-Platform Area). Increasingly, geographic information systems (GIS) tools are used to explore regional and spatial impacts on biomass availability, environmental impacts, and logistics system design.

Objectives of Resource Assessment:

- Examine life-cycle analysis of biofuels, as compared to conventional fuels
- Determine cost competitiveness of cellulosic ethanol and other biofuels
- Analyze availability of feedstocks for next-generation biofuels
- Respond to media and scientific criticism of biofuels.

Resource Assessment Milestones:

- By 2012, identify environmental (climate, water, and land use) and feedstock quality (i.e., size, chemical composition, moisture, etc.) criteria and establish a methodology for incorporation into biomass supply assessments for agricultural residues, energy crops, and forest resources pathways.
- By 2013, identify environmental criteria (soil, health, and air quality) and establish a methodology for incorporation into biomass supply assessments for agricultural residues, energy crops, and forest resources pathways.
- By 2014, integrate environmental and feedstock quality criteria into biomass supply assessments for agricultural residues, energy crops, and forest resources pathways.
- By 2016, produce a fully integrated assessment of potentially available feedstock supplies under specified criteria and conditions.

Resource Assessment Goals:

- Establish geographic and economic criteria under which 130 million dry tons (DT) per year would be available by 2012 and to establish geographic, economic, quality, and environmental criteria under which 250 million DT per year would be available by 2017.

Feedstock Production

The Production Sub-Platform Area works to establish productivity and environmental sustainability baselines for feedstock production (e.g., how much can be produced, how production can be expanded, and how it can be done sustainably).

Objectives of Feedstock Production:

To overcome the lack of

- Credible data on price, location, quality, and quantity of biomass production
- Consideration of how major technological advantages in production technologies will impact biomass availability
- Adequate data on the environmental effects of feedstock production and residue collection
- Comprehensive research on the sustainability impacts of the production and use of energy crops (such as water and fertilizer inputs, establishment and harvesting impacts on soil, etc.).

Feedstock Production Goals:

- Establish productivity and environmental sustainability (e.g., soil quality, water use/quality, and GHG emissions) baselines for feedstock production through the successful completion of the Regional Feedstock Partnership trials, transitioning to the watershed-scale feedstock sustainability efforts.

Feedstock Logistics

The rapid buildup and expansion of the U.S. cellulosic biofuels industry to meet federal targets could be severely constrained by the lack of a standardized supply-system infrastructure capable of handling a diverse set of biomass feedstocks. The feedstock logistics research and development (R&D) efforts of the Biomass Program are focused on developing and optimizing cost-effective integrated systems for collecting, storing, preprocessing, and transporting a range of cellulosic feedstocks, including agricultural residues, forest resources, and dedicated energy crops to avoid constraining the supply of a diverse set of biomass feedstocks.

Feedstock Logistics Milestones:

- By 2012, validate baseline integrated feedstock logistics systems for dry corn stover and debarkable woody forest resources at a field scale.
- By 2015, validate advanced herbaceous and woody biomass preprocessing systems against conversion quality criteria.
- By 2017, validate a fully integrated advanced feedstock logistics system that accepts all herbaceous and woody biomass resources at a field scale.

Feedstock Logistics Goals:

- Reduce costs from harvest to biochemical conversion plant gate to $0.39 per gallon of ethanol (equivalent to approximately $35 per DT in 2007 dollars) by 2012 and then achieve those same cost goals for a wider range of herbaceous feedstocks by 2017. For woody feedstock resources, the logistics cost goal from harvest to gasification plant gate is $0.49 per gallon of ethanol (equivalent to approximately $35 per DT in 2007 dollars) by 2012 and then to achieve those same cost goals for a wider range of woody feedstocks by 2017.

Feedstock Sustainability

The Biomass Program is committed to developing the resources, technologies, and systems needed for biofuels to grow in a way that enhances the health of our environment and protects our planet.

Objectives of Feedstock Sustainability:

This sub-platform area is working to

- Develop diverse, nonfood feedstocks that require little water, fertilizer, or new land
- Foster sustainable forestry practices
- Harvest biomass components selectively, leaving adequate soil nutrients
- Assess life-cycle impacts of major scale-up in biofuels production, from feedstocks to vehicles, addressing land use and soil health, water use, air quality issues, and impacts on GHG emissions.

Feedstock Sustainability Goal:

- By 2012, identify metrics and set targets for climate, water, and land use for agricultural residues, energy crops, and forest resources pathways.

Additional Information

Additional information about the Platform Review can be found at the Review website: http://www.obpreview2011.govtools.us/.

The site includes the agenda for all the Platform Reviews, links to the background documents, like the 2004 EERE Peer Review Guidelines, the 2009 Feedstock Platform Peer Review Report and other documents, the Biomass Program Feedstock Platform Presentations, and all of the project presentations.

The full Program Review can be found at http://www.obpreview2011.govtools.us/review/, including similar access to relevant documents and presentations at the Program level.

The Biomass Program provides the most up-to-date versions of Program documents, including the Multi-Year Program Plan (MYPP) and the *U.S. Billion-Ton Update* (the 2011 follow-up to the 2005 *Billion-Ton Study*) at http://www1.eere.energy.gov/library/.

Platform Evaluation, Criteria, and Rating System

For the evaluation, the reviewers were asked to review background documents to better understand the Program, its objectives, and the EERE Peer Review Guidance. These documents included, but were not limited to, the EERE Peer Review Guidance Document (2004), the MYPP, and other Platform-specific documentation. For the individual projects, the reviewers read the project abstracts, the presentations (most were the final presentation versions, though some presenters brought updated versions on the days of the reviews), and any supporting information made available on the Program Peer Review website by the PI, the presenter, and/or other project team members.

During the project reviews, each reviewer evaluated projects in their assigned platforms and sub-platform areas based on their expertise, except where they had conflicts of interest.

Following the project reviews, the Feedstock Panel reviewers were asked to attend a briefing with the Platform Manager at the close of the review meeting to discuss immediate thoughts and opinions about the projects, to compose a Review Panel report summing up those results for the Program Review (held in June 2011), and to provide comments on the final Platform Peer Review report (this document), to revise the Review Panel report conclusions, or update any project or Platform-specific comments or scores in light of PI responses to the initial reviews.

Project Evaluation Criteria

The projects were each evaluated using six criteria.

1. **Approach (scored)**
   Each project's approach was scored by evaluating the degree to which the project had
   a. Implemented technically sound research, development, and deployment approaches and demonstrated necessary results to meet targets
   b. Identified a project management plan that included well-defined milestones and adequate methods for addressing potential risks.
2. **Technical Progress and Accomplishments (scored)**
   Each project's technical progress was scored by evaluating the degree to which the project had
   a. Made progress in its objectives and stated project management plan
   b. Met its objectives by achieving milestones and overcoming technical barriers.
3. **Project Relevance (scored)**
   Each project's relevance was scored by evaluating the degree to which the project
   a. Both identified with, and contributed to, meeting the Platform goals and objectives of the MYPP
   b. Considered applications of the expected outputs.
4. **Critical Success Factors (scored)**
   Each project's critical success factors were scored by evaluating the degree to which the project:
   a. Identified critical factors (including technical, business, market, regulatory, and legal factors) that impact the potential technical and commercial success of the project
   b. Presented adequate plans to recognize, address, and overcome these factors
   c. Had the opportunity to advance the state of technology and impact the viability of commercial biomass feedstock supply through one or more of the following:
      i. Identification of existing and potential feedstock resources for bioenergy conversion
      ii. Establishment of a baseline for environmental sustainability of feedstock supply (i.e., production, harvest/collection, and processing)
      iii. Establishment of a baseline for feedstock productivity
      iv. Investigation of feedstock quality/characteristics
      v. Feedstock chemical composition (e.g., carbohydrate and nitrogen).

5. **Technology Transfer and Collaborations (not scored)**
   Technology transfer was not scored, but reviewers were asked to comment on the degree to which the project adequately interfaced and coordinated with other institutions and projects to provide additional benefits to the Biomass Program, such as publications, awards, or others.

6. **Overall Impressions (not scored)**
   Overall impressions were not scored (overall scores for the projects were computed from the average of individual values of the reviewer-scored criteria), but reviewers were asked to provide an overall evaluation of the project, including strengths, weaknesses, and any recommendations to the project approach, scope, and any other overall comments.

Scoring

Each scored evaluation criteria was ranked on a 1–10 scale with the following qualities:

Superior (10 or 9)
All aspects of the criteria are comprehensively addressed. There are significant strengths, and no more than a few weaknesses that are easily correctable.

Good (8 or 7)
All aspects of the criteria are adequately addressed. There are significant strengths and some weaknesses. The significance of the strengths outweighs most aspects of the weaknesses.

Satisfactory (6 or 5)
Most aspects of the criteria are adequately addressed. There are strengths and weaknesses. The significance of the strengths slightly outweighs aspects of the weaknesses.

Marginal (4 or 3)
Some aspects of the criteria are not adequately addressed. There are strengths and significant weaknesses. The significance of the weaknesses outweighs most aspects of the strengths.

Unsatisfactory (2 or 1)
Most aspects of the criteria are not adequately addressed. There may be strengths, but there are significant weaknesses. The significance of the weaknesses outweighs the strengths.

Each scored evaluation criteria was also supported by comments on the strengths and weakness of the project as to that criteria.

Platform/Program Evaluation

Similar to the individual projects, the platform itself was evaluated via five criteria (three scored criteria, and two un-scored).

1. Relevance (scored): Please evaluate the degree to which
   a. Platform goals, technical targets, and barriers are clearly articulated and logical
   b. Platform goals and planned activities support the goals and objectives outlined in the MYPP
   c. Achieving Platform goals will increase the commercial viability of biofuels.
2. Approach (scored): Please evaluate the degree to which
   a. Platform approaches are effective, as demonstrated by the extent to which Platform milestones and organization, the project portfolio, and strategic directions facilitate reaching Program Performance Goals as outlined in the MYPP
   b. The platform portfolio is focused and balanced to achieve Biomass Program and Platform goals, as demonstrated by work breakdown structure, unit operations, and pathway prioritization.
3. Progress (scored): Please evaluate the degree to which the Platform is progressing toward achieving Biomass Program and Platform goals, specifically in reference to meeting performance targets and the likelihood of achieving the goals presented.
4. Overall Impressions: Please provide an overall evaluation of the project, including strengths, weaknesses, and any gaps in the platform portfolio.
5. Additional recommendations, comments, and observations.

Score Calculations Only those scores provided in completed reviews were used to determine the overall scores for each project. Reviewers could take notes and ask questions of projects—even where they were not intending on scoring that project—when it would provide them with information relevant to evaluating projects in general or the Program as a whole. The average and standard deviations were calculated for each criterion, as well as for all of the projects overall. The overall score for the platform was not based on a consensus score by the reviewers, but on the individual evaluations provided on the "2011 Feedstock Platform Peer Review" presentation given by the Feedstocks Team Lead John Ferrell, although the comments and scores reflected all Office of Biomass Program Feedstock Platform presentations and reviewed Platform projects.

RESULTS

Reviewers evaluated the Feedstock Platform and scored projects on a scale of 1–10 for each applicable criterion, and they provided written comments on approved criteria. The two tables that follow present the Summary of Platform results and comment, as well as the detailed Project Scoring Summary information from the review of the individual projects.

The detailed scoring includes the work breakdown structure number (WBS); project reference information; recipient information; average scores and associated standard deviation information for each criterion; total average project score; and information on the projects percentile rank. Overall, total average project scores in the Feedstock Platform ranged between 8.8 and 3.6, with a mean of 7.6. The presentation of the percentile rank shows the percentage of scores in the frequency distribution that are score exactly the same or less than the referenced project.

Results of Platform Evaluation

Criteria	Average Score*	Range	Standard Deviation
1. Relevance	9.2	*8-10*	0.75
2. Approach	8.6	*8-10*	0.80
3. Progress	8.4	*7-10*	1.02

* Average represents mean of individual reviewer scores. Review Panels did not develop consensus scores.

Relevance

Reviewer Comments
Platform goals, technical targets, and barriers are clearly articulated and logical. Connections to other parts of the energy programs and other agency programs are clearly articulated. The planned activities support the goals and objectives outlined in the MYPP. The Program is looking at both biochemical and thermochemical with increasing emphasis on feedstocks appropriate for thermochemical conversion and appropriately moving away from EtOH.
Sustainable feedstock supply is a vital and costly part of the biofuel production process. The Feedstock Platform research contributes new knowledge, equipment, and tools that enable lower cost, more environmentally compatible, and higher yielding raw materials.
The presentation was very relevant to the review.
John Ferrell gave a compelling and clear presentation on the Platform goals and objectives. It is evident that achieving Platform goals will increase the commercial viability of biofuels.
Feedstock Sustainability Sub-Platform goals are appropriate, and project portfolio is highly relevant to goals. If I read them correctly, the Feedstock Production Sub-Platform goals are to complete the regional trials and establish production and sustainability baselines. I am not clear on when this is to be completed, but the information appears to contribute to the 2012 (geographic and economic) and 2017 (quality and sustainability) resource assessment goals. These efforts appear to be on target.

Platform Response

The Technology Manager thanks the Review Panel for their comments about the relevance and clarity of Program goals and targets. To clarify for the reviewer, the Regional Feedstock Partnership trials will execute their final year of field trial work in crop year 2012. The reviewer is correct that the knowledge and information gained will contribute to 2012 and 2017 Platform goals.

Approach

Reviewer Comments

The approaches outlined appear effective at addressing both strategic goals and effecting technical progress toward those goals. The portfolio is balanced through FY 2011, but is lacking in balance for FY 2012, given the drastic drop in funding for the feedstock production program.

Over the past few years the Program has moved to include demonstration of process operations through the deployable preprocessing system to reduce the risk of technology transfer from labs to a fledgling industry.

The approach has been focused on supply chains for very large biorefineries. As the high cost of transport and storage of feedstocks is being accepted, there is a need to consider more decentralized conversion of biomass to intermediates, which are then gathered to augment processing capabilities of large regional biorefineries.

To a large extent, the engineering R&D appears to have focused on incremental improvements to existing equipment and process systems such as pellets, grinders, rotary dryers, balers, etc. We support the focus to reduce risk and get the bioenergy industry moving toward commercialization. It may be useful to also support over the horizon paradigm shifting invention of order-of-magnitude processes and equipment that capitalize on fundamental understanding and emerging knowledge of materials and properties.

Platform is heavily logistics. These projects are not conversion, but relate closely (strategic goals, sustainable technologies, assessment goal, and production goal) with sustainability; 2017 goals for feedstock cost for $35 per DT and $0.49 per gallon in future thermochemical conversion.

Drop-in logistics funding for FY 2012 to $5 million from $15 million in FY 2011. Production funding will be $1 million in FY 2012 from $11 million in FY 2011.

From the 2009 Peer Review, the Platform added woody biomass, sweet sorghum, sustainability; integrated conversion and biorefinery, KDF as a central tool, and larger scale efforts for production and logistics.

From a sustainability standpoint, the goals articulated and the approach appear to be clear and achievable.

The Feedstock Sustainability Sub-Platform includes a diverse portfolio of research activities related to feedstock sustainability, including primary data generation, modeling, data-sharing/management and stakeholder consensus-building. This diversity creates excellent opportunities for synergistic learning and to a large extent these opportunities are being capitalized on, especially through the KDF, which is a novel and key approach to moving from research to development. There are a few instances where inter-researcher communication should be increased. (In these cases, it will be important not to wait for the after-the-fact exchange that occurs through the KDF.) As for the Sustainability Platform, I would also like to add a word of caution on the heavy reliance on SWAT throughout this and other platforms. In some applications (not necessarily those in these platforms), SWAT is well-calibrated for flow but not for water-quality loadings (sediment, nitrogen, phosphorous). It may be useful to complement SWAT with the use of empirically based models such as SPARROW. The Feedstock Production Sub-Platform portfolio seems appropriate. As I suggested for the Sustainability Platform, I think a review of this type would benefit by the inclusion of a critical analysis by the Platform Manager of progress toward Platform goals. Reviewers can comment on studies and indicate their sense of progress or problems, but cannot perform a systematic analysis (though this panel could review/comment on one).

Platform Response

The Technology Manager appreciates the reviewers' comments relative to Program balance through 2011 and concern about shifting focus in 2012. The Feedstock Platform working within the R&D scope responsibilities established by the "Growing America's Fuels" directive will strive to engage USDA-led efforts in feedstock production research to continue providing the data and knowledge required. As noted by the reviewer, the R&D scope for the Feedstocks Platform going forward is focused on feedstock logistics. Within the feedstock logistics focus, the Platform is striving to move research gains through the Technology Readiness Levels (TRLs) to reduce risk for the industry.

Progress

Reviewer Comments
Notable areas of progress include increased emphasis on woody biomass and sustainability; closer integration with other platforms (e.g., conversion); and work on the KDF.
Progress is good in the arena of agricultural and energy grass crop feedstocks, but lagging for woody biomass from forest, urban, and plantation sources. Lessons learned by INL in their bale storage trials and deployable feedstock processing system are already being incorporated into plans and operation of commercial biofuels projects.
Progress appears to be reasonable even though many challenges still remain. The final target (36 billion gallons in 2022) is a formidable one and requires close cooperation between different players, but it is certainly achievable with continuous monitoring and a few course corrections. From a sustainability standpoint, there are activities associated with each of the goals. Development of metrics/ indicators, baseline levels and targets appear to be on track. The rate limiting step is improving sustainability of technology development and deployment of best practices. Technology is evolving at a rapid pace, and hence, it is critical to keep track of competing processes (non-biofuel technology) as well as new developments in the biofuel conversion process (for example, new processes for the production of drop-in fuels).
Feedstock Sustainability Sub-Platform: Individual studies are in most cases making good progress. I believe this portfolio is about right for the requirements of the 2012 and 2013 Program targets and probably as good as could be done with the available funding, but it is unlikely the Program targets will be fully completed on time. It would be enlightening for the Platform Review to include the Sustainability Platform Manager's Gantt chart for pulling the necessary and relevant information from each study in the two sustainability platforms and applying it to the respective elements of the 2012 and 2013 Program targets. Feedstock Production Sub-Platform: As mentioned above, these efforts appear to be on target and a full assessment of progress presumably would need to come out of the efforts presented by Graham and Woodbury. Nonetheless, a presentation, however piecemeal, that put the available production (and perhaps sustainability) findings to date into the *BTS* context would have been helpful (see further under "Additional Rec").

Platform Response

The Technology Manager appreciates the reviewers' recognition of increased emphasis on woody biomass systems, as well as the note that additional focus is warranted. The Platform project portfolio has added several woody biomass focused projects, and ongoing projects with the national laboratories and other partners have been working to include woody biomass where appropriate. The Technology Manager also appreciates recognition from the reviewers that knowledge transfer to industry is occurring. The Platform has a range of collaborations with developing commercial-scale systems. These collaborations are working to support industry in meeting future Renewable Fuel Standard (RFS) targets, but the Technology Manger also recognizes the challenges ahead in meeting RFS. The reviewers' comments about the Feedstock Sustainability work being balanced and making progress are appreciated. The Platform has worked hard to address the range of key issues with limited resources.

Overall Impressions

Reviewer Comments
Progress in sustainable feedstock production will be substantially impeded at FY2 012 budget levels. Partner agency, USDA's, FY 2012 budget does not appear to show any significant increase for sustainable feedstock production, meaning that U.S. government-wide, there is an overall substantial reduction in funding for sustainable feedstock production. This serves as a serious impediment, because you can't convert something that hasn't been produced.
I wish to commend the Program leaders for addressing the recommendations and concerns of the 2009 Platform Review Panel. There is evidence across the project presentations that new knowledge is being produced as a result of modified Program direction.
Comments on Feedstock Sustainability Sub-Platform: The presentation was cogent and cohesive. As stated earlier, there needs to be added focus on economic and social sustainability and the link with environmental sustainability. Economic optimization is key to success of the Platform goals. Metrics should include comparison with competing technologies. Within the biofuels industry, establishment of sustainability metrics for different final products (for example, ethanol versus drop-in) is also critical. DOE's effort (through the National Renewable Energy Laboratory) in the area of drop-in fuels is laudable and USDA's National Institute of Food and Agriculture also had a major request for proposals recently. New companies such as Joule have shown a lot of promise for drop-in fuels. This will certainly speed up the commercialization of biofuels.
Comments on Feedstock Sustainability Sub-Platform: The Feedstock Production Sub-Platform is well distributed (geographically and across feedstocks) and well integrated.

Platform Response

The Technology Manager appreciates recognition of the Platform in addressing the 2009 Review Panel recommendations. The Platform has worked hard to improve through the guidance of the review process. It is recognized, as stated by the reviewers, that the current portfolio of projects focused on feedstock production will have limited progress with no additional funding support available. With feedstock production research being explicitly supported by USDA, going forward the Platform will work to build the necessary collaborations to ensure success for both agencies. The Technology Manager appreciates the reviewers' suggestion for additional focus on economic and social sustainability issues. Economic sustainability issues are primarily addressed through the technology platforms within the Biomass Program, and require extensive intra-Program collaborations. The Sustainability Platform will be addressing social sustainability through broad agency and university collaborations, with the path forward being established with a social sustainability workshop targeted in early 2012. The development of sustainability metrics will include comparisons of multiple technology pathways. The Technology Manager appreciates the reviewers' recognition that the shift in focus to drop-in fuels through the DOE Biomass Program represents a positive move forward.

Additional Recommendations, Comments, and Observations

Reviewer Comments
The issue of competing uses for lignocellulosic biomass by biopower, exporting solid biofuels, conversion to bioproducts, etc., needs to be better understood and factored into supply analyses. The cost of biomass feedstocks to biorefiners is likely to be substantially higher than used in most DOE projections due to a need for risk adjusted return on capital by producers and participants in the feedstock supply chain, competing uses, and the ever-increasing demand for quality.
The long-term nature of some of this research poses a challenge to achieving goals. Leveraging existing experiments currently on-going via Land Grant Institutions and USDA-ARS is a critical and cost-effective strategy. While some of this is being done, an explicit strategy to network existing, relevant, long-term experiments would greatly enhance progress toward goals.
Comments on Feedstock Sustainability Sub-Platform: It would be useful if, as a matter of course, all modelers compared their results back to the relevant *BTS* findings. Discrepancies do not necessarily show which result is more correct, but represent valuable opportunities for model-based learning. In each of the presentations in the Feedstock Production Sub-Platform, when presenting the research, it would be nice to see the yield goals for the crop and region at hand expressed in context of the *BTS*: what fraction of national biomass goals does this feedstock potentially represent? What production levels does *BTS* assume ought to be achieved, and how do these various findings to date relate to that context? For example, one of the logistics presentations made this statement: "Southern pine plantations have the ability to provide 100 million dry tons/year for bioenergy markets." I don't know if this was a *BTS* reference or the presenter's assertion, but I like the way this statement established a resource-context for the presentation.

Platform Response

The reviewer's concern about understanding issues associated with competing uses is shared by the Technology Manager. The Platform portfolio has been assembled to address key technology barriers associated with the commercial-scale deployment of bioenergy production for the wide range of potential conversion pathway markets that may emerge. The *U.S. Billion-Ton Update: Biomass Supply for a Bioenergy and Bioproducts Industry* and the goals and targets set forth in the Biomass Program MYPP work to consider key policy and market drivers that will impact biomass uses. The Platform will continue to emphasize the delivery of biomass to a broad range of potential markets and the implications of the range of markets in its research. The Technology Manager appreciates the reviewer's recognition of increased costs associated with feedstock risk. The goals set forth for 2012 have been focused on niche (or ideal) feedstock production and supply scenarios. Building a national scale industry will certainly pose a number of additional challenges and the platform will continue working with integrated biorefinery collaborators to establish accurate cost goals and targets. The Platform is working hard to foster and grow collaborations with USDA and Land Grant Universities. As the reviewer suggested, challenging budget scenarios will require these collaborations to achieve the goals of the Platform. The Platform will act on the reviewer's suggestion to develop and share an explicit strategy for these collaborations and leveraging activities. The Technology Manager appreciates the insight from the reviewer on more explicit coupling/comparison of research results with the *BTS*. The results and data from the recent update to the *BTS* is available on the KDF and the Platform is moving the portfolio of projects to consider how results and data can contribute, augment, or compare to the existing information available from the update.

Project Review

Project Scoring Summary Table

Feedstock - Sustainability (*Projects are listed in the order of their appearance on the Feedstock Platform Review agenda)*

Project Number	Project Title; Presenting Organization; PI Name	Approach		Progress		Relevance		Success Factors		Total Average Score	Percentile Rank %
		Average	SD	Average	SD	Average	SD	Average	SD		
1.6.1.3	Supply Forecast & Analysis; ORNL; Bob Perlack	8.6	0.88	8.3	1.22	8.9	1.05	8.8	0.67	**8.5**	**86%**
8.1.7.3/ 8.1.7.4	Short Rotation Woody Biomass; ORNL; Natalie Griffiths	7.6	1.78	8.2	1.23	7.8	1.48	7.3	1.49	**7.7**	**44%**
6.3.2.20	Council on Sustainable Biomass; Council on Sustainable Biomass Production; John Heissenbuttel	6.5	2.46	6.4	1.96	6.8	2.44	6.3	2.36	**6.5**	**10%**
1.7.1.5	NCSU Watershed; N. C. State University; George Chescheir	7.1	1.45	7.2	1.03	7.5	0.85	6.6	1.65	**7.1**	**21%**
1.7.1.6	Purdue Watershed; Purdue University; Indrajeet Chaubey	8.4	0.88	8.4	0.73	8.6	0.88	8.1	1.05	**8.4**	**76%**
1.7.1.7	U-Mn Mississippi Watershed; University of Minnesota; Jason Hill	7.2	1.20	6.9	1.76	7.2	1.39	6.6	1.42	**7.0**	**18%**
1.7.1.2	ORNL Watershed; ORNL; Virginia Dale	8.8	0.92	8.8	0.92	8.9	1.29	8.6	1.07	**8.8**	**100%**

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Project Number	Project Title; Presenting Organization; PI Name	Approach		Progress		Relevance		Success Factors		Total Average Score	Percentile Rank %
		Average	SD	Average	SD	Average	SD	Average	SD		
11.1.1.2	ANL Biomass and Nitrogen; ANL; M. Cristina Negri	6.7	1.64	8.0	1.49	7.6	1.71	7.2	1.69	**7.4**	28%
8.1.7.2	Land Use Change p.1; University of Wisconsin; Randy Jackson	7.6	1.27	7.7	1.25	7.9	1.35	6.9	0.69	**7.5**	31%
8.1.7.1	Land-Use Change p.2; Joint Global Change Research Institute; Cesar Izaurralde	6.6	1.13	7.2	1.64	6.6	1.33	6.6	1.94	**6.7**	15%
1.6.1.8	Bioenergy KDF; ORNL; Budhendra Bhaduri	8.70	0.82	8.7	1.16	9.1	1.29	8.2	1.55	**8.7**	97%

Feedstock (Projects are listed in the order of their appearance on the Feedstock Platform Review agenda)

Project Number	Project Title; Presenting Organization; PI Name	Approach		Progress		Relevance		Success Factors		Total Average Score	Percentile Rank %
		Average	SD	Average	SD	Average	SD	Average	SD		
1.1.1.1a	Regional Feedstock Partnership Overview; Sun Grant – South Dakota State University; Jim Doolittle	8.3	0.82	8.5	0.84	8.8	0.75	8.0	0.63	**8.4**	78%
1.1.1.1b	Regional Feedstock Partnership: Agricultural Residues & Stover Removal Tool; USDA – ARS; Doug Karlen	8.3	0.52	8.2	0.75	8.8	0.75	8.5	0.55	**8.5**	84%
1.1.1.1e	The Regional Feedstock Partnership: Herbaceous Energy Crops and CRP Land for Biomass Production; South Dakota State University; Vance Owens	7.7	1.03	7.8	1.17	7.7	1.03	7.7	0.82	**7.7**	42%
1.1.1.1c	RFSP: Woody Energy Crops; University of Tennessee; Tim Rials	8.6	0.89	7.8	0.84	7.8	0.84	6.2	1.64	**7.6**	36%
1.1.1.1d	RFSP: Resource Assessment; ORNL; Robin Graham	7.6	1.52	8.2	1.30	8.4	1.14	7.4	1.14	**7.9**	39%
1.3.1.5	Demonstration of On-Farm Production of a Dedicated Energy Crop incorporating Multiple Varieties of Switchgrass Seed; University of Tennessee; Sam Jackson	8.8	1.10	8.4	1.14	8.6	1.34	7.4	1.67	**8.3**	68%

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Project Number	Project Title; Presenting Organization; PI Name	Approach		Progress		Relevance		Success Factors		Total Average Score	Percentile Rank %
		Average	SD	Average	SD	Average	SD	Average	SD		
1.6.1.2	Feedstock Supply Chain Analysis; INL; Jake Jacobson	7.0	0.82	7.2	1.07	6.2	3.17	7.3	1.26	**7.2**	23%
1.6.1.1	Feedstock Supply System Logistics; ORNL; Erin Webb	8.3	0.50	7.9	0.88	6.8	3.21	7.3	0.50	**7.9**	50%
1.3.1.3/ 1.3.1.4b	Engineering & Fundamentals: Harvest, Collection, and Storage; INL; Kevin Kenney	8.5	1.00	8.7	0.46	7.4	3.77	8.3	0.96	**8.6**	92%
1.3.1.3/ 1.3.1.4a	Engineering & Fundamentals Preprocessing, Handling, & Transportation; INL; Christopher Wright	8.8	0.50	8.4	0.88	7.0	3.45	8.5	1.29	**8.5**	86%
1.3.1.2	Deployable Process Demonstration Unit; INL; Richard Hess	8.0	1.41	8.9	1.04	7.0	3.40	7.5	2.08	**8.3**	63%
1.6.1.9	Analysis Integration; INL; David Muth	8.0	0.82	8.0	0.96	7.2	3.60	8.0	1.15	**8.3**	63%
6.5.2.5	China - Biomass Supply Logistics; INL; Christopher Wright	6.8	1.89	6.6	1.53	4.8	2.88	6.3	2.50	**6.3**	5%
1.2.1.4	Integration of Advanced Logistical Systems and Focused Bioenergy Harvesting Technologies to Supply Crop Residues and Energy Crops in a Densified Large Square Bale Format; AGCO CORPORATION; Maynard Herron	8.8	0.50	8.9	0.72	7.5	3.97	7.5	1.29	**8.6**	92%

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Project Number	Project Title; Presenting Organization; PI Name	Approach		Progress		Relevance		Success Factors		Total Average Score	Percentile Rank %
		Average	SD	Average	SD	Average	SD	Average	SD		
1.2.1.6	Design and Demonstration of an Advanced Agricultural Feedstock Supply System for Lignocellulosic Bioenergy Production; FDC; Fred Circle	8.8	1.26	8.4	1.14	6.3	3.34	8.3	1.50	**8.3**	71%
1.2.1.5	Development of a Bulk-Format System to Harvest, Handle, Store, and Deliver High-Tonnage Low-Moisture Switchgrass Feedstock; University of Tennessee; Alvin Womac	8.8	0.96	8.0	0.68	6.5	3.40	6.5	0.58	**7.8**	47%
1.2.1.2	Development and Deployment of a Short Rotation Woody Crops Harvesting System Based on a Case New Holland Forage Harvester and SRC Woody Crop Header; SUNY ESF; Timothy Volk	8.3	0.96	8.0	1.23	7.0	3.39	7.3	1.71	**8.0**	52%
1.2.1.3	High-Tonnage Forest Biomass Production Systems from Southern Pine Energy Plantations; Auburn; Steven Taylor	8.3	0.58	8.7	0.58	8.7	0.58	8.0	1.00	**8.4**	78%
7.6.2.6	Regional Biomass Feedstock Development Partnership; Sun Grant - South Dakota State University; Jim Doolittle	8.5	0.58	8.3	0.43	6.7	3.46	8.3	0.50	**8.3**	71%

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Project Number	Project Title; Presenting Organization; PI Name	Approach		Progress		Relevance		Success Factors		Total Average Score	Percentile Rank %
		Average	SD	Average	SD	Average	SD	Average	SD		
7.1.2.6	High-Yield Feedstock and Biomass Conversion Technology for Renewable Energy and Economic Development; University of Hawaii; Andrew Hashimoto	8.0	0.82	7.2	1.05	6.7	3.06	8.5	0.58	**8.0**	52%
7.1.2.5	Research and Technology Development for Genetic Improvement of Switchgrass; University of Rhode Island; Albert Kausch	6.3	1.50	6.2	1.35	5.5	2.08	6.0	1.63	**6.3**	5%
7.1.1.1	Bioenergy Alliance High-Tonnage Bioenergy Crop Production and Conversion into Conventional Fuels; Texas AgriLife Research; Bob Avant	7.8	1.50	7.3	1.19	6.3	3.14	7.3	0.96	**7.5**	31%
7.1.3.2	Forestry Biofuel Statewide Collaboration Center (MI); MI Economic Development Corp; Donna LaCourt	8.0	1.00	8.3	1.53	8.0	1.00	8.0	1.00	**8.1**	57%
7.1.2.10	Saint Joseph's University Institute for Environmental Stewardship; Saint Joseph's University; Clint Springer	4.0	1.87	4.8	2.28	3.4	1.34	2.2	1.10	**3.6**	0%
7.5.4.5	Biorefinery Development Using Multiple Feedstocks; Louisiana State University: Agriculture Center; Don Day	8.3	0.58	8.3	0.58	8.3	0.58	7.7	1.15	**8.2**	60%

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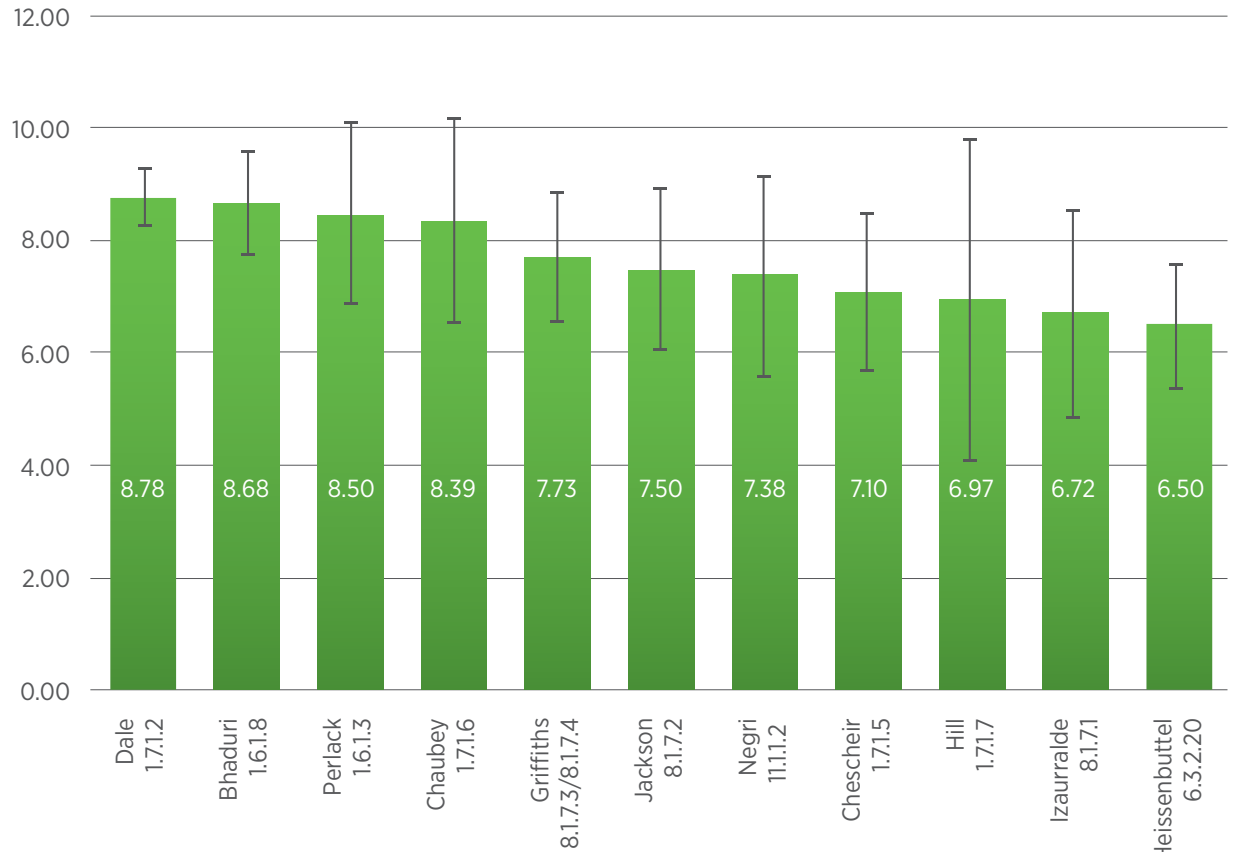
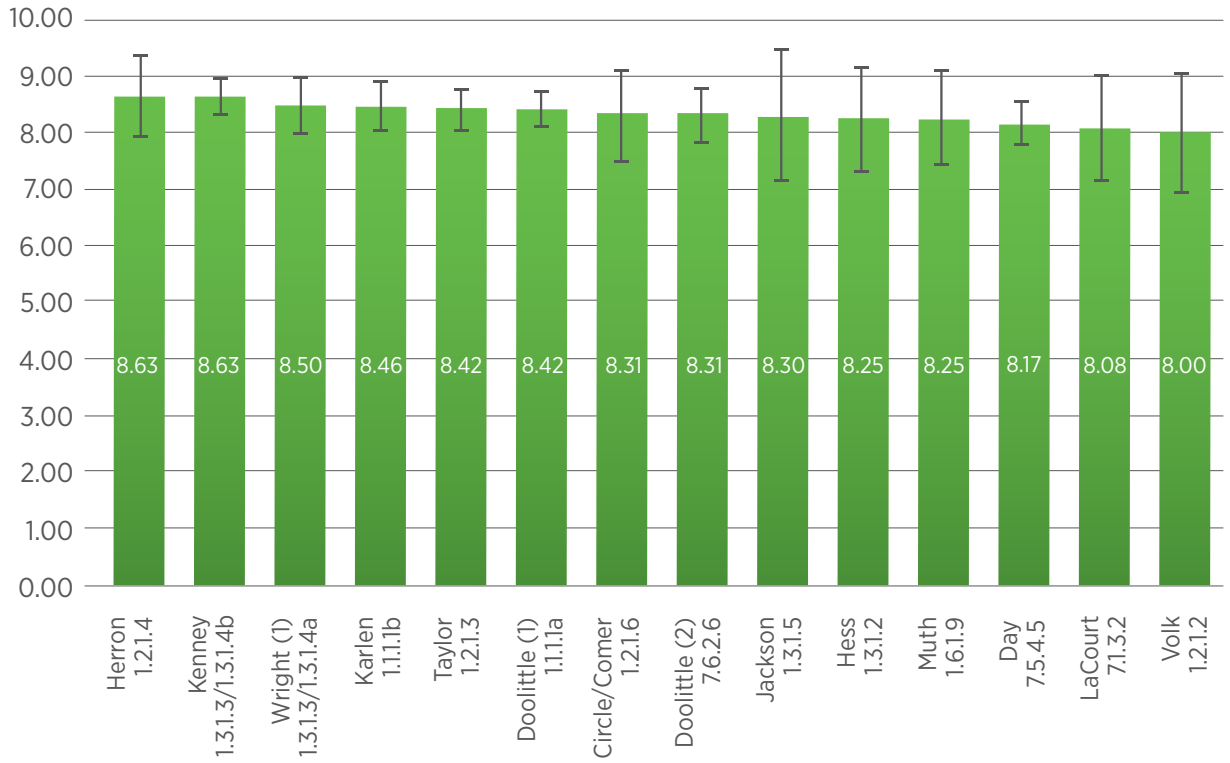
Project Number	Project Title; Presenting Organization; PI Name	Approach		Progress		Relevance		Success Factors		Total Average Score	Percentile Rank %
		Average	SD	Average	SD	Average	SD	Average	SD		
7.1.2.8	Sweet Sorghum Alternative Fuel and Feed Pilot Project; University of Arizona; Donald Slack	7.8	0.50	6.9	0.48	6.2	2.93	7.3	1.26	**7.3**	26%
7.1.2.9	Second Generation Biofuels: Carbon Sequestration and Life Cycle Analysis; University of Nebraska-Lincoln; Adam Liska	6.0	1.41	7.0	0.71	4.9	2.75	5.5	1.29	**6.1**	2%
7.1.5.11	Alternative Crops and Biofuel Production; Oklahoma State University; Philip Kenkel	7.5	0.58	6.3	2.55	5.9	2.74	6.0	2.94	**6.6**	13%

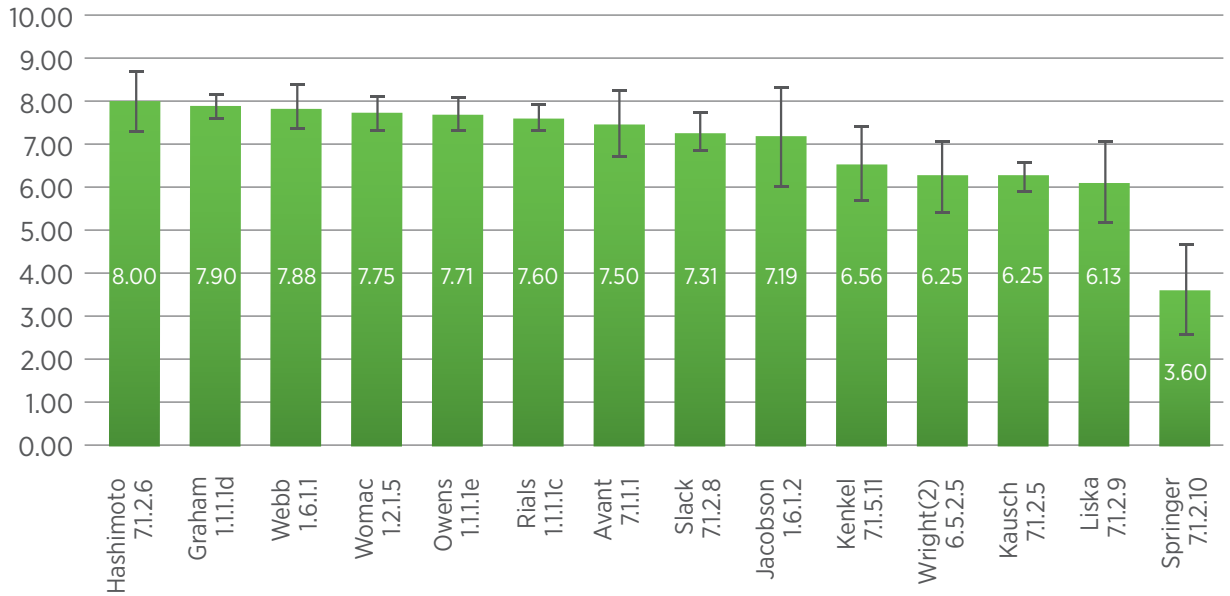
Feedstock (Sustainability) Overall Scores



Feedstock - Overall Scores Part 1



Feedstock - Overall Scores Part 2



COMPENDIUM INFORMATION

1. Biomass Program MYPP: www.eere.energy.gov/biomass/pdfs/mypp_november_2011.pdf Feedstock Platform: Page 41 (PDF)

2. Full Compilation of Reviewer Comments for the Feedstock Platform
   Reviewer Comments are direct transcripts of commentary and material provided by the Platform's Review Panel. They have not been edited or altered by the Biomass Program.
   www.eere.energy.gov/biomass/pdfs/2011_feedstock_review_comments.pdf

3. Peer Review Portal Website Peer Review Page: http://obpreview2011.govtools.us/
   Feedstock Page: http://obpreview2011.govtools.us/feedstocks/

ATTACHMENTS

1. Platform Review Meeting Agenda
2. List of Attendees
3. Biomass Program Review Steering Committee
4. Project Evaluation Form
5. Platform Evaluation Form

Feedstock Platform Review Meeting Agenda

Time	WBS#	Project Title	Presenter/ Recipient	Performing Organization
Date: 4/6/2011				
8:00 a.m. – 8:15 a.m.	0.0.0.0	Feedstock Platform Overview (Presentation)	John Ferrell	U.S. Department of Energy, Biomass Program
FEEDSTOCK ANALYSIS & SUSTAINABILITY PROJECTS				
8:15 a.m. – 8:30 a.m.	0.0.0.3	Feedstock Analysis & Sustainability Overview (Presentation)	Alison Goss Eng	U.S. Department of Energy, Biomass Program
8:30 a.m. – 9:15 a.m.	1.6.1.3	Supply Forecast & Analysis (Abstract, Presentation)	Bob Perlack	Oak Ridge National Laboratory
9:15 a.m. – 9:50 a.m.	8.1.7.3/ 8.1.7.4	Short Rotation Woody Biomass (Abstract, Presentation)	Natalie Griffiths	Oak Ridge National Laboratory
BREAK				
10:00 a.m. – 10:25 a.m.	6.3.2.20	Council on Sustainable Biomass (Abstract, Presentation)	John Heissenbuttel	Council on Sustainable Biomass Production
10:25 a.m. – 10:50 a.m.	1.7.1.5	NCSU Watershed (Abstract, Presentation)	George Chescheir	North Carolina State University
10:50 a.m. – 11:15 a.m.	1.7.1.6	Purdue Watershed (Abstract, Presentation)	Indrajeet Chaubey	Purdue University
11:15 a.m. – 11:40 a.m.	1.7.1.7	U-Mn Mississippi Watershed (Abstract, Presentation)	Jason Hill	University of Minnesota
11:40 a.m. – 12:25 p.m.	1.7.1.2	Oakridge National Laboratory (ORNL) Watershed (Abstract, Presentation)	Virginia Dale	Oak Ridge National Laboratory
LUNCH				
1:30 p.m. – 2:00 p.m.	11.1.1.2	ANL Biomass and Nitrogen (Abstract, Presentation)	M. Cristina Negri	Argonne National Laboratory
2:00 p.m. – 2:30 p.m.	8.1.7.2	Land-Use Change p.1 (Abstract, Presentation)	Randy Jackson	University of Wisconsin-Madison

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Time	WBS#	Project Title	Presenter/ Recipient	Performing Organization
2:30 p.m. – 3:00 p.m.	8.1.7.1	Land-Use Change p.2 (Abstract, Presentation)	Cesar Izaurralde	Joint Global Change Research Institute
3:00 p.m. – 3:40 p.m.	1.6.1.8	Bioenergy KDF (Abstract, Presentation)	Budhendra Bhaduri	Oak Ridge National Laboratory
Date: 4/7/2011				
FEEDSTOCK PRODUCTION PROJECTS				
8:00 a.m. – 8:15 a.m.	0.0.0.1	Feedstock Production Overview	Laura McCann	U.S. Department of Energy, Biomass Program
8:15 a.m. – 8:25 a.m.	1.1.1.1	Regional Feedstock Partnership Overview(Abstract, Presentation)	Jim Doolittle	Sun Grant – South Dakota State University
8:25 a.m. – 9:10 a.m.	1.1.1.1	Regional Feedstock Partnership: Agricultural Residues & Stover Removal Tool (Abstract, Presentation)	Doug Karlen	U.S. Department of Agriculture, Agricultural Research Service
9:10 a.m. – 10:00 a.m.	1.1.1.1	The Regional Feedstock Partnership: Herbaceous Energy Crops and CRP Land for Biomass Production (Abstractv, Presentation)	Vance Owens	South Dakota State University
BREAK				
10:15 a.m. – 10:55 a.m.	1.1.1.1	RFSP: Woody Crops (Abstract, Presentation)	Timothy Rials	University of Tennessee, Center for Renewable Carbon
10:55 a.m. – 11:25 a.m.	1.1.1.1	RFSP: Resource Assessment (Abstract, Presentation)	Robin Graham	Oak Ridge National Laboratory
11:25 a.m. – 11:55 a.m.	1.3.1.5	Demonstration of On-Farm Production of a Dedicated Energy Crop incorporating Multiple Varieties of Switchgrass Seed (Abstract, Presentation)	Sam Jackson	University of Tennessee
11:55 a.m. – 12:05 p.m.	0.0.0.4	Increased Seed Oil by Metabolic Regulation (Abstract, Presentation)	Frank Turano	Plant Sensory Systems

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Time	WBS#	Project Title	Presenter/ Recipient	Performing Organization
LUNCH				
BIOMASS FEEDSTOCK LOGISTICS PROJECTS				
1:05 p.m. – 1:20 p.m.	0.0.0.2	Biomass Feedstock Logistics (Presentation)	Sam Tagore	U.S. Department of Energy, Biomass Program
1:20 p.m. – 1:45 p.m.	1.6.1.2	Feedstock Supply Chain Analysis (Abstract, Presentation)	Jake Jacobson	Idaho National Laboratory
1:45 p.m. – 2:10 p.m.	1.6.1.1	Feedstock Supply System Logistics (Abstract, Presentation)	Erin Webb	Oak Ridge National Laboratory
2:10 p.m. – 2:55 p.m.	1.3.1.3/ 1.3.1.4	Engineering & Fundamentals: Harvest, Collection and Storage (Abstract, Presentation)	Kevin Kenney	Idaho National Laboratory
BREAK				
3:10 p.m. – 3:55 p.m.	1.3.1.3/ 1.3.1.4	Engineering & Fundamentals Preprocessing, Handling, & Transportation (Abstract, Presentation)	Christopher Wright	Idaho National Laboratory
3:55 p.m. – 4:25 p.m.	1.3.1.2	Deployable Process Demonstration Unit (Abstract, Presentation)	J. Richard Hess	Idaho National Laboratory
4:25 p.m. – 4:50 p.m.	1.6.1.9	Analysis Integration (Abstract, Presentation)	David Muth	Idaho National Laboratory
4:50 p.m. – 5:15 p.m.	6.5.2.5	China - Biomass Supply Logistics (Abstract, Presentation)	Christopher Wright	Idaho National Laboratory
Date: 4/8/2011				
8:00 a.m. – 8:10 a.m.	0.0.0.5	Feedstock Logistics Day 2 Overview	Sam Tagore	U.S. Department of Energy, Biomass Program

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Time	WBS#	Project Title	Presenter/ Recipient	Performing Organization
8:10 a.m. – 8:35 a.m.	1.2.1.4	Integration of Advanced Logistical Systems and Focused Bioenergy Harvesting Technologies to Supply Crop Residues and Energy Crops in a Densified Large Square Bale Format (Abstract, Presentation)	Maynard Herron	AGCO Corporation
8:35 a.m. – 9:00 a.m.	1.2.1.6	Design and Demonstration of an Advanced Agricultural Feedstock Supply System for Lignocellulosic Bioenergy Production (Abstract, Presentation)	Fred Circle	FDC Enterprises
9:00 a.m. – 9:25 a.m.	1.2.1.5	Development of a Bulk-Format System to Harvest, Handle, Store, and Deliver High-Tonnage Low-Moisture Switchgrass Feedstock (Abstract, Presentation)	Alvin Womac	University of Tennessee
9:25 a.m. – 9:50 a.m.	1.2.1.2	Development and Deployment of a Short Rotation Woody Crops Harvesting System Based on a Case New Holland Forage Harvester and SRC Woody Crop Header (Abstract, Presentation)	Timothy Volk	State University of New York – College of Environmental Science and Forestry
9:50 a.m. – 10:15 a.m.	1.2.1.3	High Tonnage Forest Biomass Production Systems from Southern Pine Energy Plantations (Abstract, Presentation)	Steve Taylor	Auburn University

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Time	WBS#	Project Title	Presenter/ Recipient	Performing Organization
		BREAK		
10:30 a.m. – 10:50 a.m.	7.6.2.6	Regional Biomass Feedstock Development Partnership (Abstract, Presentation)	Jim Doolittle	Sun Grant - South Dakota State University
10:50 a.m. – 11:00 a.m.	7.1.2.6	High-Yield Feedstock and Biomass Conversion Technology for Renewable Energy and Economic Development (Abstract, Presentation)	Andrew Hashimoto	University of Hawaii
11:00 a.m. – 11:10 a.m.	7.1.2.5	Research and Technology Development for Genetic Improvement of Switchgrass (Abstract, Presentation)	Albert Kausch	University of Rhode Island
11:10 a.m. – 11:20 a.m.	7.1.1.1	Bioenergy Alliance High-Tonnage Bioenergy Crop Production and Conversion into Conventional Fuels (Abstract, Presentation)	Bob Avant	Texas AgriLife Research
11:20 a.m. – 11:30 a.m.	7.1.3.2	Forestry Biofuel Statewide Collaboration Center (MI) (Abstract, Presentation)	Donna LaCourt	Michigan Economic Development Corporation
11:30 a.m. – 11:40 a.m.	7.1.2.10	Saint Joseph's University Institute for Environmental Stewardship (Abstract, Presentation)	Clint Springer	Saint Joseph's University
11:40 a.m. – 11:50 a.m.	7.5.4.5	Biorefinery Development Using Multiple Feedstocks (Abstract, Presentation)	Don Day	Louisiana State University: Agriculture Center

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Time	WBS#	Project Title	Presenter/ Recipient	Performing Organization
11:50 a.m. – 12:00 p.m.	7.1.2.8	Sweet Sorghum Alternative Fuel and Feed Pilot Project (Abstract, Presentation)	Donald Slack	University of Arizona
12:00 p.m. – 12:10 p.m.	7.1.2.9	Second Generation Biofuels: Carbon Sequestration and Life Cycle Analysis (Abstract, Presentation)	Adam Liska	University of Nebraska-Lincoln
12:10 p.m. – 12:20 p.m.	7.1.5.11	Alternative Crops and Biofuel Production (Abstract, Presentation)	Philip Kenkel	Oklahoma State University

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LIST OF ATTENDEES

First Name	Last Name	Organization
Chris	Abernathy	Oak Ridge National Laboratory
Mark	Allen	Algal Biomass Organization
Bob	Avant	Texas AgriLife Research
John	Blake	Savannah River National Laboratory
Sylvie	Brouder	Purdue University
Randy	Bruins	Environmental Protection Agency
Marilyn	Buford	U.S. Department of Agriculture, Forest Service
Bill	Burgeson	University of Minnesota
Indrajeet	Chaubey	Purdue University
George	Chescheir	North Carolina State University
Calvert	Churn	Renewable Algal Energy
Fred	Circle	FDC Enterprises
Aaron	Crowell	BCS, Incorporated
Bruce	Dale	Michigan State University
Don	Day	Louisiana State University: Agriculture Center
Chris	Detter	Los Alamos National Laboratory
Jim	Dooley	Forest Concepts
Jim	Doolittle	South Dakota State University
Daniel	Drell	U.S. Department of Energy, Office of Science
Don	Erbach	Advanced Biofuels USA
Daniel	Fishman	BCS, Incorporated
Yaa-Yin	Fong	University of Hawaii
Christian	Fritsen	Desert Research Institute
Roxanne	Garland	U.S. Department of Energy, Fuel Cell Technology Program
Benjamin	Gramig	Purdue University
Natalie	Griffiths	Oak Ridge National Laboratory
Brian	Halbrendt	Flint Hills Resources
Kenneth	Hall	Texas Engineering Experiment Station (TEES)
Andrew	Hashimoto	University of Hawaii
Richard	Hegg	USDA NIFA
Maynard	Herron	AGCO Corporation
Becky	Herron	AGCO Corporation
Laura	Herron	AGCO Corporation
John	Hewson	Sandia National Laboratories
Jason	Hill	University of Minnesota
Rodney	Holcomb	Oklahoma State University
C. Rhett	Jackson	University of Georgia

CONTINUES ON NEXT PAGE

First Name	Last Name	Organization
Randy	Jackson	University of Wisconsin
Sam	Jackson	University of Tennessee
Mark	Jacobs	Meridian
Albert	Kausch	University of Rhode Island
Pat	Kendrick	AGCO Corporation
Philip	Kenkel	Oklahoma State University
Kevin	Kenney	Idaho National Laboratory
Kevin	Kephart	South Dakota State University
George	Kervitsky	BCS, Incorporated
Robert	Kozak	Atlantic Biomass Conversions
Nicole	Labbe	Center for Renewable Carbon, University of Tennessee
Donna	LaCourt	Michigan Economic Development Corporation
Matt	Langholtz	Oak Ridge National Laboratory
Adam	Liska	University of Nebraska-Lincoln
Patrick	Luckow	Pacific Northwest National Laboratory/Joint Global Change Research Institute
Bob	Matousek	AGCO Corporation
Mike	McCann	Saint Joseph's University
Raymond	Miller	Michigan State University
Terry	Nipp	Sun Grant Association
Jeff	Obbard	Cellana, LLC
Jose	Olivares	Los Alamos National Laboratory
Bob	Perlack	Oak Ridge National Laboratory
Valerie	Reed	U.S. Department of Energy, Biomass Program
john	Rezaiyan	3E Consulting LLC
Richard	Rhodes	University of Rhode Island
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CONTINUES ON NEXT PAGE

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Roger C. Prince, Ph.D.	-	Scientist, Biomedical Sciences Division, ExxonMobil
Robert Miller, Ph.D.	-	Consultant, Retired Air Products & Chemicals

Feedstock Project Evaluation

Using the following criteria, reviewers are asked to rate the project work presented in the context of the Program objectives, both numerically, and with specific, concise comments to support each evaluation. **Please provide both strengths and weakness to support your score.**

Superior		Good		Satisfactory		Marginal		Unsatisfactory	
10	9	8	7	6	5	4	3	2	1
All aspects of the criteria are comprehensively addressed. There are significant strengths and no more than a few weaknesses that are easily correctable.		All aspects of the criteria are adequately addressed. There are significant strengths and some weaknesses. The significance of the strengths outweighs most aspects of the weaknesses.		Most aspects of the criteria are adequately addressed. There are strengths and weaknesses. The significance of the strengths slightly outweighs aspects of the weaknesses.		Some aspects of the criteria are **not** adequately addressed. There are strengths and significant weaknesses. The significance of the weaknesses outweighs most aspects of the strengths.		Most aspects of the criteria are **not** adequately addressed. There may be strengths, but there are significant weaknesses. The PI fails to demonstrate the project's capability to meet objectives.	

1. Project Approach (1–10):
Please evaluate the degree to which

a) The project performers have implemented technically sound research, development, and deployment approaches and demonstrated necessary results to meet their targets

b) The project performers have identified a project management plan that includes well-defined milestones and adequate methods for addressing potential risks.

2. Technical Progress and Accomplishments (1–10):
Please evaluate the degree to which the project has

a) Made progress in its objectives and stated project management plan

b) Met its objectives in achieving milestones and overcoming technical barriers.

3. Project Relevance (1–10):
Please evaluate the degree to which

a) The project both identifies with and contributes to meeting the Platform goals and objectives of the Biomass Program Multi-Year Program Plan

b) The project has considered applications of the expected outputs.

4. Critical Success Factors (1–10):
Please evaluate the degree to which

a. The project has identified critical factors (including technical, business, market, regulatory, and legal factors) that impact the potential technical and commercial success of the project

b. The project has presented adequate plans to recognize, address, and overcome these factors

c. The project has the opportunity to advance the state of technology and impact the viability of commercial biomass feedstock supply through one or more of the following:

   i. Identification of existing and potential feedstock resources for bioenergy conversion

   ii. Establishment of a baseline for environmental sustainability of feedstock supply (i.e., production, harvest/collection, and processing)

   iii. Establishment of a baseline for feedstock productivity

   iv. Investigation of feedstock quality/characteristics

   v. Feedstock chemical composition (e.g., carbohydrate and nitrogen).

5. Technology Transfer and Collaborations: (no score)
Please comment on the degree to which the project adequately interfaces and coordinates with other institutions and projects to provide additional benefits to the Biomass Program, such as publications, awards, or others.

6. Overall Impressions
Please provide an overall evaluation of the project, including strengths, weaknesses, and any recommendations to the project approach and scope, as well as any other overall comments.

Feedstock Project Evaluation

1. Project Approach (1–10):
Please evaluate the degree to which:

a) The project performers have implemented technically sound research, development, and deployment approaches and demonstrated necessary results to meet their targets

b) The project performers have identified a project management plan that includes well-defined milestones and adequate methods for addressing potential risks.

2. Technical Progress and Accomplishments (1–10):
Please evaluate the degree to which the project has

a) Made progress in its objectives and stated project management plan

b) Has met its objectives in achieving milestones and overcoming technical barriers

3. Project Relevance (1–10):
Please evaluate the degree to which:

a) The project both identifies with and contributes to meeting the platform goals and objectives of the Biomass Program Multi-Year Program Plan

b) The project has considered applications of the expected outputs

4. Critical Success Factors (1–10):
Please evaluate the degree to which:

a. The project has identified critical factors, (including technical, business, market, regulatory, and legal factors) that impact the potential technical and commercial success of the project

b. The project has presented adequate plans to recognize, address, and overcome these factors

c. The project has the opportunity to advance the state of technology and impact the commercial viability and environmental performance of biomass feedstock supply through one or more of the following:

   i. Identification of existing and potential feedstock resources for bioenergy conversion

   ii. Establishment of a baseline for environmental sustainability of feedstock supply (i.e. production, harvest/collection, and processing)

   iii. Establishment of a baseline for feedstock productivity

   iv. Investigation of feedstock quality/characteristics

   v. Composition of feedstock chemicals (e.g., carbohydrates and nitrogen)

   vi. Inclusion of sustainability data across the supply chain

   vii. Definition of indicators or a methodology for evaluating sustainability

   viii. Definition of best practices for sustainable bioenergy production

   ix. Consideration of potential interactions and trade-offs among different goals (energy security, environmental protection, low-cost commodities) and different bioenergy scenarios.

5. Technology Transfer and Collaborations (no score):
Please comment on the degree to which the project adequately interfaces and coordinates with other institutions and projects to provide additional benefits to the Biomass Program, such as publications, awards, or others.

Platform Evaluation

1. Relevance (1–10):
Please evaluate the degree to which

a) Platform goals, technical targets, and barriers are clearly articulated and logical

b) Platform goals and planned activities support the goals and objectives outlined in the MYPP

c) Achieving Platform goals will increase the commercial viability of biofuels.

How could the Platform change to better support the Biomass Program goals?

2. Approach (1–10):
Please evaluate the degree to which

a) The Platform approaches are effective, as demonstrated by the extent to which Platform milestones and organization, project portfolio, and strategic directions facilitate reaching Program Performance Goals as outlined in the MYPP

b) The Platform portfolio is focused and balanced to achieve Biomass Program and Platform goals, as demonstrated by Work Breakdown Structure; unit operations; and pathway prioritization.

Please explain your score by commenting on the strengths and weakness evaluated.

What changes would increase the effectiveness of the Platform?

3. Progress (1–10):
Please evaluate the degree to which the Platform is progressing toward achieving Biomass Program and Platform goals, specifically in reference to meeting performance targets and the likelihood of achieving the goals presented.

Please provide recommendations for improvements for tracking progress.

4. Overall Impressions (no score):
Please provide an overall evaluation of the Platform, including strengths, weaknesses, and any gaps in the Platform portfolio.

5. Additional Recommendations, Comments, and Observations (no score):
Please provide any additional recommendations, comments, and observations you have about the Platform or the Platform portfolio.

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