



2011 BIENNIAL REVIEW REPORT

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

Review Date

June 27-28, 2011





Department of Energy

Washington, D.C. 20585

Dear Colleague:

This document summarizes the recommendations and evaluations resulting from the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Biomass Program's Biennial Peer Review Meeting, held June 27–28, 2011, at the DoubleTree Hotel-Crystal City in Arlington, Virginia.

All programs in the Department of Energy, Office of Energy Efficiency and Renewable Energy, are required to conduct a formal peer review of project portfolios as a means for enhancing the management, relevance, effectiveness, and productivity of the activities. The Biomass Program accomplishes this requirement using a two-fold approach, consisting of the following:

- *Platform Reviews* – Sub-elements of the Program, referred to as platforms, undergo a systematic review of their project portfolios and platform management by a team of relevant subject-matter experts. During this year's peer review process, eight individual platforms and a total of 217 projects were reviewed. The Biomass platform reviews were conducted from February 2011 through April 2011 in the Washington, D.C., and Denver, Colorado, areas.
- *Program Review* – The observations, comments, recommendations, and platform management responses resulting from the platform reviews then are considered, along with detailed information on the Program management by another group of reviewers.

The entire process was guided by a six-person Steering Committee that met routinely via conference calls, attended platform review meetings, and worked to ensure that the process was implemented in a fair and consistent manner for each of the eight platforms. To further ensure consistency throughout the process, the 14-person Program Review Panel comprised the Steering Committee members and the lead reviewer from each of the individual platforms.

The Program is indebted to the contributions made by the Steering Committee, the reviewers of each of the individual platform reviews, and the staff and contractors that worked to ensure that the 2011 Peer Review Process was implemented in a fair and equitable manner. The Program is also indebted to the principal investigators of the federally funded projects that attended the meetings and presented information on their projects. Thank you for your interest in the Program and the peer review process.

Mr. Neil P Rossmeissl

2011 Biomass Program Peer Review Lead

Office of Energy Efficiency and Renewable Energy

U.S. Department of Energy

EXECUTIVE SUMMARY

On June 27–28, 2011, the U.S. Department of Energy (DOE), Office of Energy Efficiency and Renewable Energy (EERE), Biomass Program conducted its biennial Program Peer Review at the DoubleTree Hotel-Crystal City in Arlington, Virginia. This meeting was conducted in accordance with *EERE Peer Review Guidance*¹ to ensure that the review process provided an independent, expert evaluation of the strategic goals and direction of the Program and was a forum for feedback and recommendations on current and future Program planning. This review consisted of reviewing the majority of projects within the Program’s portfolio. The general consensus is that the Program is well-managed, productive, and relevant.

The use of peer reviews is a widely accepted and effective tool for enhancing the relevance, effectiveness, and productivity of projects in industry, government, and academia. The Biomass Program Review built upon eight previously conducted platform peer review meetings that were conducted from February 2011 to April 2011. The platform peer review meetings were designed to evaluate the individual projects and portfolios of the Biomass Program’s technical platforms.

The Program Peer Review Panel comprised 14 external experts with exemplary qualifications and wide-ranging expertise pertinent to both the Biomass Program and the technical platforms. Among the 14 reviewers were six Steering Committee members that provided oversight and guidance to ensure consistency, transparency, and independence throughout the 2011 peer review process, and eight lead reviewers from the individual Platform Review Panels. Two members of the Steering Committee were selected to serve as co-leads for the Steering Committee and the Program Review Panel. The co-leads worked together to coordinate Panel discussions and capture the comments, opinions, and sentiments of the Review Panel and worked diligently to consider the individual comments and organize them into this report. Table ES-1 provides information on the 14-member Program Review Panel.

Table ES-1. The 2011 Program Review Panel.

Reviewer Name	Role	Professional Title and Affiliation
Neal Gutterson, Ph.D.	Steering Committee, Co-lead	President & CEO, Mendel Biotechnology, Inc.
Mark E. Jones, Ph.D.	Steering Committee, Co-lead	Fellow, Dow Chemical Company
Elizabeth Marshall, Ph.D.	Steering Committee	U.S. Department of Agriculture, Economic Research Service
Janet Hawkes, Ph.D.	Steering Committee	Consultant, Bio-business Consultant
Roger C. Prince, Ph.D.	Steering Committee	Scientist, Biomedical Sciences Division, ExxonMobil

¹ http://www1.eere.energy.gov/ba/pba/pdfs/eereprg_a.pdf

Reviewer Name	Role	Professional Title and Affiliation
Robert Miller, Ph.D.	Steering Committee	Consultant, Retired Air Products & Chemicals
George Parks, Ph.D.	Lead Reviewer, Integrated Biorefinery Platform	Consultant Retired Conoco Phillips
Albert Hochhauser	Lead Reviewer, Infrastructure Platform	Consultant, Retired ExxonMobil
Steve Kelley, Ph.D.	Lead Reviewer, Biochemical Conversion Platform	Associate Professor, Food Science & Technology, Oregon State University
Kelly Ibsen	Lead Reviewer, Analysis Platform	Professional Chemical Engineer, Lynx Engineering, LLC
Allison L. Brady	Lead Reviewer, Sustainability Platform	Sr. Scientist, Life Cycle Management, Georgia-Pacific, LLC
James Dooley, Ph.D., PE	Lead Reviewer, Feedstock Platform	Chief Technology Officer, Forest Concepts, LLC
Tryg Lundquist, Ph.D.	Lead Reviewer, Algae Platform	Associate Professor, Civil and Environmental Engineering, California Polytechnic State University

Summary of Peer Evaluation

The general consensus is that the Program is well managed, productive, and relevant. The recent influx of funding from the American Recovery and Reinvestment Act of 2009 (Pub.L. 111-5) has shifted the balance of the Program toward large demonstration and deployment projects. Due to the nature and purpose of this legislation, these funding levels are understandable and should enable accelerated production of commercial cellulosic biofuels. The Panel hopes that funding returns to normal levels consistent with other DOE research, development, demonstration, and deployment (RDD&D) programs.

The Program has done a commendable job of building the Sustainability Platform to align with recommendations in the 2009 Program Review. Despite this progress, reviewers note that there are significant “bigger picture” gaps in the Program portfolio related to the interactions of sustainable production and other critical factors that will ultimately determine success in the marketplace. The Program continues to adapt to new information and market conditions by shifting priorities and including new areas of investigation. A move toward drop-in fuels is accelerating. Inclusion of biopower projects as a means to assist in the development of feedstock markets has been set in motion. Increased interest in bioproducts will further expand the Program. Reviewers generally believed that increased emphasis in these areas has the potential to lead to new approaches for handling and converting biomass, and these will add to a Program that already has a good balance of biochemical, thermochemical, and photosynthetic conversion technologies in the portfolio.

Inconsistent funding continues to hamper Program stability and realization of emerging priorities. In addition, the Program goals always have included biopower and bioproduct applications. These have been, and continue to be, underrepresented in the portfolio. As highlighted by previous review panels, there continues to be a lack of coordination between platforms within DOE and between other federal agencies (particularly with USDA in feedstocks).

The Program Review process requires some fine tuning. It is unclear that the process and the resulting actions and recommendations are driving the desired results within the Program. Steering Committee members participating in the review noted some concern regarding the scoring of the individual projects throughout the Platform Review process. When platform staff were questioned on the importance of the scores and comments, many stated that the comments are the most important part of the review results. While many platform reviewers saw value in rating projects based on performance, it was not clear that the scoring process, as currently employed, achieves the desired results. It was suggested that the review process be simplified for future reviews. This year marks the move of the review process to cyberspace. The first webcast review sessions were a success, and this technology should be used for future reviews.

Recommendations and Suggestions

The role of the Panel was to review the Program against a set of criteria and prepare comments and recommendations that the Biomass Program management team can use to implement substantive changes and ultimately strengthen and enhance the Program. The following is a summary of recommendations made throughout this document:

- The Panel considers the challenge of creating a full supply chain for new cellulosic crops as one of the most significant challenges to the development of this critical source of cellulosic biomass. The Panel recommends that the Program consider additional funding for the development of pilot- and demonstration-scale biopower and techno-economic analyses of torrefaction to produce solid feedstock and pyrolysis to produce liquid feedstocks.
- The Panel recommends a specific, designed effort to review the aggregate Integrated Biorefinery (IBR) projects and provide relevant information, input, and lessons learned to the various other platforms in the next year(s).
- The Panel sees merit in the activities conducted in the Infrastructure Platform and appreciates the need for interagency transition of these activities. The Panel recommends that a seamless transition of these activities is undertaken and that the Program remain involved and up-to-date on the progress in this critical area.
- The Panel recommends uniform application of life-cycle assessment, particularly in terms of boundary conditions and indirect effects, to assess individual projects and technologies.
- Lack of transparency in the analyses of large and public project failures must be resolved. The panel recommends that DOE prepares for large-scale project failures, such as Range Fuels, in the future by having provisions in contracts that allow for the release of information in the event that a project fails to meet its obligations.

- The Panel recommends that the Program should fund a study/white paper to document where application of funding in biopower and bioproducts is needed to spur development outside its existing commercial business applications.
- The Panel recommends that education and outreach of results be included as an explicit objective of each of the platforms. In future Funding Opportunity Announcement (FOA) requirements, the Program could include a plan for communicating results and outcomes of funded projects. (The National Science Foundation has a good model for this.)
- The Panel recommends that future reviews incorporate an overview of the emerging concepts from the Office of Science to provide a better understanding of the technology pipeline.
- The Panel felt strongly that sustainability metrics should be incorporated across all the platforms.
- DOE's vision that densification and commoditization of biomass streams (part of the preprocessing step) are fundamental to the emergence of a robust bioenergy industry is excellent, but that vision must be shared by other agencies and industry if it is to be proven. The chemical and biochemical composition of processed and densified materials must be evaluated to provide a set of standardized specifications that will support growth of the industry.
- The Panel recommends that platform management assures that the best prior information is brought to bear in managing the platform portfolio—particularly in light of setting appropriate expectations and realistic targets.

INTRODUCTION

The U.S. Department of Energy (DOE), Office of Energy Efficiency and Renewable Energy (EERE), Biomass Program has held a biennial Program Peer Review in odd numbered years since 2005. The results of the Peer Review are used by Biomass Program technology managers in strategic planning and management of the Program. While the use of peer reviews is a highly recognized and widely accepted means of evaluating quality, maintaining set standards, and improving project innovation and performance, they are also 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 June Program Review culminated a process that involved peer reviews of each of the Program's eight technology platforms and the research, development, demonstration, and deployment (RDD&D) and analysis projects within those platforms.

Biomass Program Overview

The mission of the Biomass Program is to develop and transform our renewable and abundant nonfood biomass resources into sustainable, cost-competitive, high-performance biofuels, bioproducts, and biopower. The Program focuses on targeted research, development, and demonstration, emphasizing support through public and private partnerships and deployment of technologies in Integrated Biorefinery (IBR) facilities.

The Program is focused on the strategic goal to develop commercially viable biomass technologies that will enable the production of biofuels nationwide and reduce dependence on oil through the creation of a new domestic bioenergy industry, thus supporting the Energy Independence and Security Act of 2007 (EISA) goal of 36 billion gallons per year of renewable transportation fuels by 2022. To achieve this strategic goal, the Program was organized around eight technology platforms: Feedstock, Biochemical Conversion, Thermochemical Conversion, IBR, Infrastructure, Algae, Sustainability, and Analysis. Exhibit 1 shows the Program funding and major legislative drivers that have impacted the Program since 1996. The Program budget and distribution across each platform is shown in Exhibit 2.

Exhibit 1 | Major Legislative Drivers and Biomass Program Funding 1996–2012

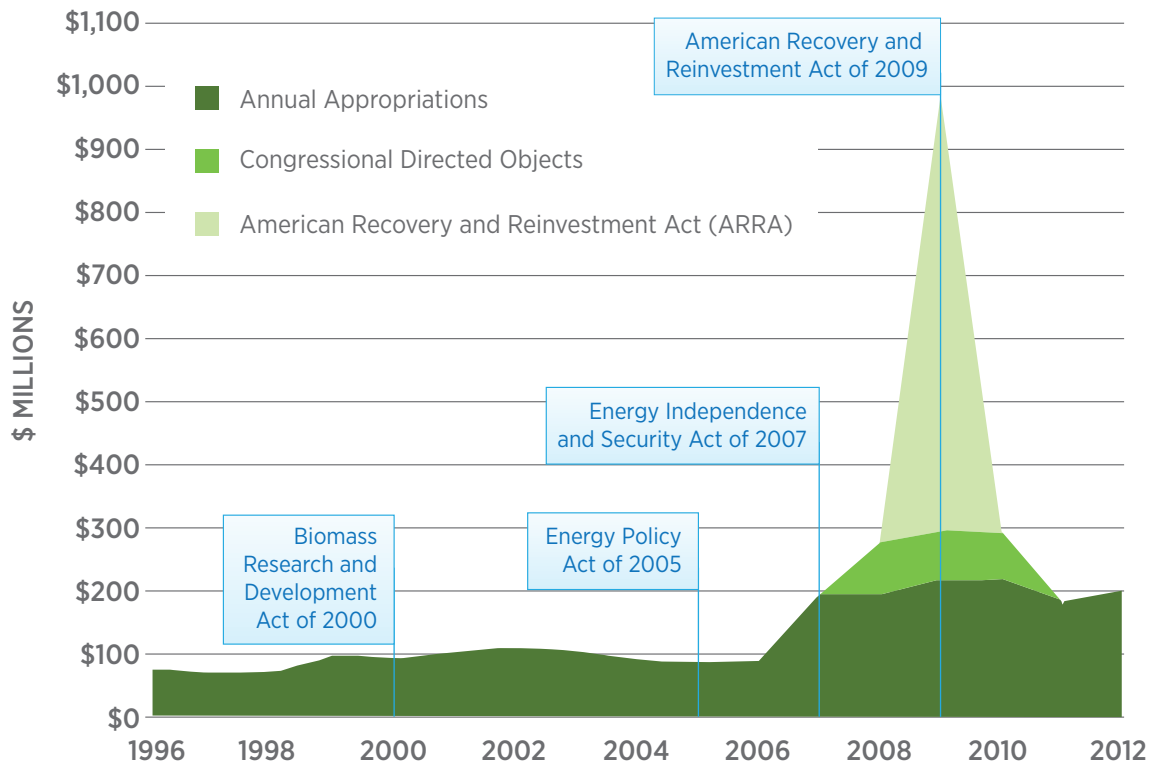
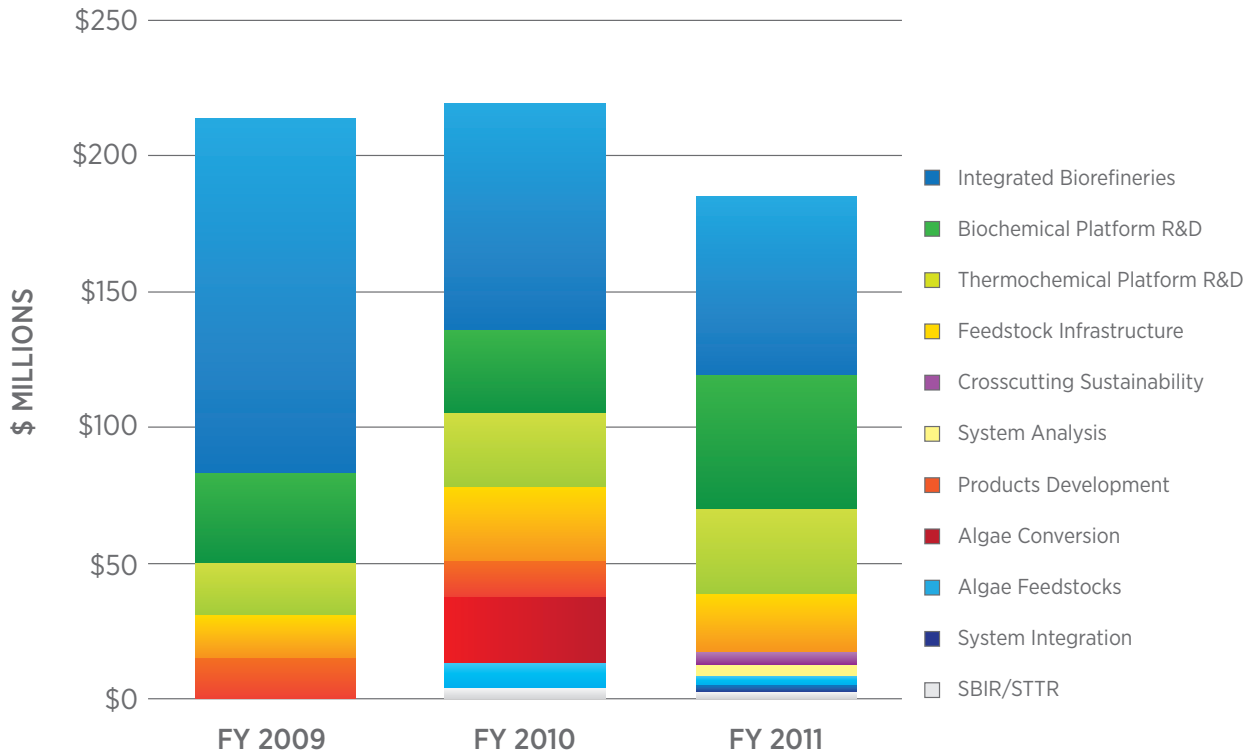


Exhibit 2 | Biomass Program Funding by Platform



Biomass Program Peer Review Process

The Biomass Program followed guidelines provided in EERE's 2004 Peer Review Guide in the design and implementation of the platform reviews and Program Review. A Steering Committee comprising external experts was established early in the process to provide recommendations and help ensure an independent and transparent review process. A description of the general steps implemented in each review is provided in Attachment 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 comprising staff from the Biomass Program, DOE Golden Office, National Renewable Energy Laboratory Systems Integrator, and contractor support. BCS, Incorporated, was the lead contractor and was responsible for organizing and implementing the peer review process. The 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 2011 Biomass Program peer review process first consisted of a series of eight platform review meetings, followed by the overall Program Review meeting. The platform review meetings consisted of technical project-level reviews of the funded research projects. The overall structure and direction of each platform also was reviewed. The platform review meetings were held from February 2011 through April 2011. A separate Review Panel comprising external reviewers with subject matter expertise related to the platform was assembled for each platform. From each panel, DOE staff designated a Lead Reviewer, who was responsible for guiding the development of the platform review report and participating in the Program Review. Separate platform review reports were developed for each platform and exist as compendium to this report. Detailed information on each of the platform review meetings held is shown in Exhibit 3.

Exhibit 3 | 2009 Platform Review Meetings, Dates, and Locations

Series 1: IBR & Infrastructure

February 1–3, 2011

Washington, D.C.

Series 2: Biochemical & Thermochemical Conversion

February 14–18, 2011

Denver, Colorado

Series 3: Analysis, Sustainability, Algae, Feedstock

April 4–8, 2011

Annapolis, Maryland

During the June 27–28, 2011, Program Review meeting, Program management and staff presented information regarding strategic planning and management approaches, as well as integration of analysis and sustainability in planning, direction, and priorities of the RDD&D platforms. In addition, the Lead Reviewers of the Platform Panels presented the results of each Panel’s evaluation.

The Panel for the Program Review consisted of the Steering Committee and the Lead Reviewer from each Platform Panel. A list of Program Review Panel members is provided in Exhibit ES1. An agenda for the meeting is provided in Attachment 2. A list of attendees is provided in Attachment 3. Presentations given during each of the platform review meetings, as well as other background information, are posted on the Peer Review Portal website: <http://obpreview2011.govtools.us/review/>.

PROGRAM REVIEW COMMENTS

Approach/Organization

The Program's management of the platform areas and its portfolio is to be commended. It is notable that commercial activity in areas nurtured by DOE continues to occur. Ineos Bio is commercializing syngas fermentation to produce ethanol, commercial sales of enzymes are occurring for biomass conversion purposes, and the further development of pyrolysis oil conversion technologies represent areas where technologies have graduated to a point that DOE support is no longer needed. These successes are reflections of a robust portfolio of projects and good management of that portfolio. The following information documents areas where reviewers felt the Program was doing well, as well as areas of concern.

Where the Program is Working Well

There are several aspects of the Program that continue to bring great value:

- The Analysis Platform continues to provide key insights for overall strategy, particularly with important techno-economic analyses and resource assessments.
- The new Sustainability Platform has made good strides. The incorporation of sustainability considerations and requirements into the IBR projects, for example, was a very important step toward ensuring sustainable outcomes for the Biomass Program. It is essential that this be continued.
- The Program shows good adaptability to changing market realities, including adaptation to the continued failure of the industry to meet baseline production levels and the influx of American Recovery and Reinvestment Act of 2009 (ARRA) funding to support deployment- and commercial-scale projects to facilitate industry development.
- The Panel felt that there was generally good and appropriate balance in the platforms and across the entire Biomass Program. This includes a balance of effort toward production of ethanol, as well as advanced molecules, from cellulosic sources.

Areas of Concern

Other areas of the Program reveal challenges that must be considered and addressed:

- While the Program has little control over variable funding, the result has prevented clear strategic focus, as exhibited by the withdrawal of a major new effort on biopower in 2011 after the continuing budget resolution was passed halfway through the fiscal year. The Panel applauds the responsiveness of the Program's management to these changes.
- The Panel considers the recent formation of an entirely new, rather large-scale platform to explore algae as a difficult challenge that has not yet achieved the level of platform quality, logic, and consistency that is seen in the other platform areas. It is critical that projects and Algae Platform focus areas be aggressively prioritized, with a good number of expected "down-selections" as the Platform becomes better focused throughout the next two years.
- The IBR investment is very large. While a major reason for the investment is to support the industry toward commercial-scale success, the underlying conversion and feedstock platforms must draw on lessons learned from these large projects to fully justify the investment. The Panel recommends a specific, designed effort to review the aggregate Integrated Biorefinery (IBR) projects and provide relevant information, input, and lessons learned to the various other platforms in the next year(s).
- The Panel is concerned that critical infrastructure concerns, once the focus of Office of Management and Budget criticism, could be impacted negatively by the transitioning of Infrastructure Platform activities out of the Program. DOE communicated to the panel that other agencies have a critical role in this area, thus eliminating the need for its inclusion in the Biomass Program. The Panel sees merit in the activities conducted in the Infrastructure Platform and appreciates the need for interagency transition of these activities. The Panel recommends a seamless transition of these activities and that the Program remain involved and up-to-date on the progress in these areas, despite the transition from the Program.
- Full cradle-to-grave of life-cycle assessment (LCA) is being used in some projects, but not consistently across the Program. The Panel recommends uniform application of LCA (particularly in terms of boundary conditions and indirect effects) to assess individual projects and technologies.
- The Panel felt that the lack of transparency in the analysis of large and public project failures must be resolved—both to enhance Program credibility and to ensure that lessons learned are shared from the IBR Platform to the research and development (R&D) platforms and possible future IBR projects. A minority opinion stated that perhaps the Program was lacking the types of tools, techniques, methodologies, and metrics necessary for successfully down-selecting from among the high-risk projects it has funded. The reviewers felt that the Program should actively gather and maintain specific information on the high-risk projects in its portfolio and better monitor the success and failure rates for such projects.
- The dramatic failure to meet near-term EISA advanced biofuel production targets, as noted in Program Manager Paul F. Bryan's presentation, must be addressed by the Program. Progress toward achieving these production targets are significantly lagging, and there is no apparent concern regarding the missing of these milestones or a formulated plan on how to make progress.

Program Funding

The influx of ARRA funds were distributed efficiently in a rational way and resulted in a portfolio of relevant, well-managed projects. While allocation of ARRA funds resulted in an emphasis within the Program portfolio on huge IBR demonstration projects that some Panel members felt is akin to putting the cart before the horse, the Panel also believed that the non-ARRA projects initiated and vetted by DOE staff are, as a group, robust. The views expressed about allocation of non-ARRA funds are mixed. Some Panel members expressed that the funds have been allocated adequately across all sectors of the Program so that each of the platforms has a reasonable budget to procure new projects toward the current the Program goals. Other Panel members emphasized the need to find funding for new research priorities, such as biopower, or to re-balance funding within the conversion platforms toward more drop-in fuels. Several Panel members also expressed concern about the allocation of funding to technologies—including algae—that do not seem to compare well with pyrolysis or methanol-to-gasoline (commonly known as MTG) routes to drop-in fuels. As noted above, movement of the Infrastructure Platform out of the Program control, and interruption of its research areas, is a consistent area of concern across the Panel.

Long-term, consistent funding for certain projects is critical. Research areas and projects specifically mentioned include the Bioenergy Knowledge Discovery Framework (KDF); BioFuels Atlas; models, such as the Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation (GREET) and Land-Use Change (LUC); and feedstock projects addressing the cycles of perennial crops (such as, willow, poplar, and grasses). Several Panel members noted in their review that it would be helpful during the Program Review for the presentations by the program and platform managers to more explicitly address how resources are distributed among Program areas.

Evolution of Technology and Project Portfolio

Program and portfolio evolution involves both expanding Program priorities to include new technologies and research areas and “down-selecting” projects or research paths, either because they have matured beyond the need for public support, have lost relevance relative to other technologies and questions, or are not meeting standards established for project-level support. The Panel discussed the need for more explicit DOE guidelines and methodologies providing a structure within where such changes can occur.

R&D programs can suffer from a hesitance to let projects succeed or fail. Graduation of successful projects is a clear necessity. When projects have succeeded in garnering industrial interest, the Program must release them. When projects have failed to deliver the expectations, or other technologies have clearly eclipsed them, the portfolio must be rebalanced. On the other hand, some panel members expressed concern about the proposed de-emphasis on gasification within the Thermochemical Platform. Process and justification for establishing priorities in such changes should be made explicit.

The Program has announced the intent to move to include drop-in biopower and bioproducts in a larger way. This represents a new research emphasis for the Program, and the Peer Review Panel expressed a diverse set of views on this shift.

One view is that these areas are a key part of the Program mission statement in the Multi-Year Program Plan (MYPP), and that their omission in the current slate of projects that were reviewed in 2011 represents a major flaw. Substitution of biomass for biopower and bioproducts in the utility, chemical, and certain manufacturing industries may be deployed much earlier than commercial biofuels and provides substantial input into substituting fossil energy sources resulting in concomitant CO₂ mitigation. Furthermore, alternative uses of biomass may help with the “catch-22” issue associated with development of biomass supply chains, in which end-users will not commit to using new biomass sources without a good supply chain and growers will not commit to producing biomass from new crops until end-users commit to their purchase. To overcome this catch-22, it is important that new crops do not have to be relied upon as sole sources of biomass for large-scale projects.

The power market segment, with flexibility in feedstocks to supply a coal-fired power generation facility (for example), would not require full sourcing from new biomass and would provide a venue for supply chain development. Thus, a majority of the Panel concluded that additional support, as originally planned in 2011, is warranted for biopower-oriented conversion technologies that would spur the use of biomass for renewable electricity and the development of new supply chains for purpose-grown cellulosic bioenergy crops (such as switchgrass, miscanthus, and short-rotation woody crops). The Panel recommends that the Program consider additional funding for the development of pilot and demo-scale biopower and techno-economic analyses of torrefaction to produce solid feedstock and pyrolysis to produce liquid feedstocks.

On the other hand, because the analyses and pathway-directed research does not fully address the competition for resources and allocation of biomass fractions to highest and best uses among the fuel, products, and power continuum, the need for a move to alternatives is largely unsubstantiated. Markets for bioproducts are considerably smaller than that for fuels, most often in the range of 100 to 1,000 times smaller. Opportunities are far more limited, and the impact considerably less than the Program’s original fuel replacement targets. Especially in light of the Program’s failure to meet near-term EISA goals for biofuel use, major proposed shifts in research priorities should be accompanied by analysis suggesting the potential benefits of such a shift in terms of minimizing market disruptions or capitalizing on low-cost, easy-entry technology opportunities. Furthermore, biopower and bioproducts are already in the commercial arena. No studies have been presented indicating where application of funding will spur developments, as was done for biofuels, so the Panel concludes that such a study/white paper is needed and recommends that the Program should fund such a study.

It also may be noted that, while platform goals are currently well-aligned with defined Program objectives related to biofuel commercialization, the goals are not as closely aligned with the more diverse set of mission goals related to reducing dependence on oil or of increasing biopower’s contribution to the nation’s energy supply. A transition toward a more diverse set of research and technology objectives may require some reorganization of platform structure and/or restatement of platform goals in order to more comfortably “house” the new research areas. Contractual arrangements between the Program and the performing organizations offer the Program limited ability to pare the projects once they are contractually set. The Biochemical Platform integrates project validation as part of the platform strategy. Other platforms would benefit from such validation projects—specifically IBR and Thermochemical platforms.

Program Coordination

The insular nature of the platforms, the Program, and even DOE, raised concern.

The Program seems to suffer from both inter-program and intra-DOE coordination issues. There seems to be little overlap with the National Energy Technology Laboratory (NETL) efforts focused on power generation, as one example. There is absolutely no coordination with DOE's Fossil Energy clean coal programs and technology development programs, many of which are synergistic to the Biomass Program. NETL, for example, has a number of projects investigating coal/biomass to liquids and investigations of low-rank coal slurry gasifiers, which are highly amenable for co-feeding at large volumes and enabling significant carbon reduction in existing processes. Cooperation and co-funding between these programs could facilitate early deployment and meet goals for both programs consistent with the overall mission of reducing imports and lowering CO₂ emissions.

Better coordination is needed between the Biomass Program and the Fossil Energy Program, the Environmental Protection Agency (EPA), and the U.S. Department of Agriculture (USDA). The effort with the Fossil Energy Program will benefit the advancement of technologies for co-firing of biomass with coal, as mentioned above, to spur biopower development and new feedstock crop supply chain development. Fossil and biomass co-firing with coal and torrefied or pyrolyzed biomass is one area where better coordination is needed, as is the use of municipal solid waste (commonly known as MSW) in biopower and biofuels applications. Better coordination with EPA is needed to ensure that biofuels and total biofuel systems are fully tested and incorporated in scalable infrastructure. Coordination with USDA is critical to the advancement of feedstock logistics and supply chain development. Since the 2009 Program Review, USDA has taken on greater responsibility for feedstock development, but it was not clear to the Panel that the interface between feedstock development (USDA) and feedstock logistics (DOE) is being co-developed effectively. Integration of DOE efforts and strategy with the USDA Biomass Research Centers, including in the area of sustainability, should be strengthened, perhaps through the Biomass Research and Development Initiative.

Within the Program, communication between the platforms to enhance cross-cutting work is essential. There should not be unintended barriers to sharing data across the platforms. The projects all are working toward a common goal of advancing the technology and deployment of the technologies to put biofuels and other biomass-based products in the marketplace. Without knowledge sharing between the platforms, the goals cannot be achieved. There were a number of times during the review process, however, where it was made clear that lessons and results do not move well between different platforms. As an example, it is clear that information gained by project performers in the Biochemical Conversion Platform cannot transfer easily to project performers in the IBR Platform.

Dissemination of Project Results

The Panel recommends that education and outreach of results be included as an explicit objective of each of the platforms. The Program could include in FOA requirements a plan for communicating results and outcomes of funded projects in the future (the National Science Foundation has a good model for this). The MYPP does not clearly call out a requirement for publication and training of students, but it could. Several of the earlier-stage projects lamented that there were not many peer reviewed publications resulting from the Program or Program-funded activities. Perhaps this is not the case, but there does not seem to be any centralized repository for such publications on the DOE or Program websites. The Panel suggests that steps be taken by Program management to place better value on the public dissemination of Program-funded research results, findings, and advancements through peer reviewed journals. Such steps could also result in the Program's recognition for its role in training scientists.

The Bioenergy KDF is a very important tool for data dissemination from funded projects, and the Program's continued commitment to making consistent data sets transparent and available will be critical to making the most of the public investment in this research area, both within the Biomass Program and the larger research community.

The very public implosion of Range Fuels, one of the larger IBR projects, is a new experience for the Program. Range Fuels did not participate in the review process, and there is little information publicly available concerning the matter. The defense offered during the review is that it is the Program's intent to fund high-risk endeavors and, therefore, failures are part of the equation. Further, it was offered that the event was a "success" because DOE took away significant knowledge. From the perspective of the Program Review Panel, it is unclear what was learned as a result of Range Fuels funding and demise. Shrouded by confidentiality, the exact nature of difficulties and the level of technical success achieved is not publicly available. This information was not presented to reviewers at the IBR Platform Review, or at the Program Review. Unless such information is made available, it cannot be used by reviewers of new solicitations, and it cannot be used to improve ongoing projects and activities. The Department should prepare for such failures in the future by having provisions in contracts that allow for the release of information in the event projects fail to meet their obligations.

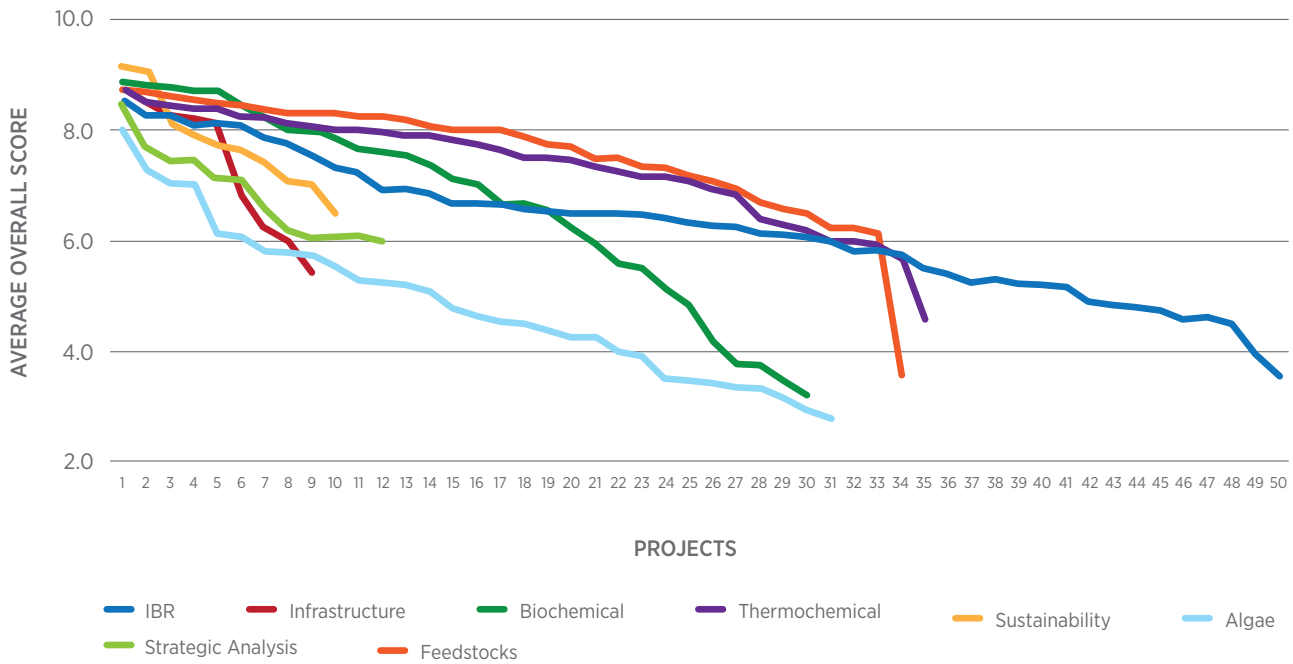
Technology Pipeline

The Program consists of a portfolio of projects that cover early stage exploration all the way to commercialization of technologies at a large scale. The review process covers the current activities and offers no window on what is coming next. The Peer Review Panel is asked to review the portfolio without the benefit of seeing the early stage ideas that will enter the portfolio next. As a result, the Program pipeline appears anemic on the exploration and over-subscribed on the demonstration projects. Other parts of DOE, such as the Office of Science, appear to have responsibility for the new project areas. The concern is that, without strong collaboration, ceding the next projects to another organization may ultimately weaken the Program overall. At worst, it may compromise the Program's continuity and ability to find synergies with existing project activities. The Panel recommends that future reviews incorporate an overview of the emerging concepts from the Office of Science to provide a better understanding of the technology pipeline.

Platform Comments

A substantial effort was made to review the individual platforms, and it is imperative that the individual platform review reports are reviewed to best understand and appreciate the comments and recommendations made by the respective Peer Review Panels. Included below are some of the higher-level comments that were revealed for the individual platforms as a result of the Program Review meeting. To facilitate discussion on the subject of project scoring, reviewers requested a chart that provided comparative information on the scoring results that were captured as a result of the individual platform review meetings. Exhibit 3 illustrates the raw scoring data from the eight individual platform review meetings overlaid on one chart. This information was generated from the reviewer scores and provided to the reviewers during the Program Review.

Exhibit 3 | Overlay Project Scoring Chart (raw scoring data from the eight individual Platform Review)



Integrated Biorefineries

The IBR suite of projects was more impacted by ARRA (commonly referred to as Stimulus Money) funding than any other platform. It consists of the largest projects and commands the largest portion of the Program's budget. The IBR Platform is unique in that industry involvement is required, bringing along with it a new set of challenges. The Platform has absorbed a number of challenges over the last years and has, on average, performed well.

The solicitation, review, and selection of the large number of projects demanded by ARRA was an impressive feat. The rigor that is applied through the use of outside consultants is admirable and serves to keep the projects and companies involved well grounded. These challenges have also created some areas of concern.

There is a distinct demarcation between the R&D platforms and the demonstration (IBR) program. No logical progression of the R&D and no method for each platform's achievements being transferred to the next deployment stage exist. The rapid funding cycle resulted in projects being funded that are very similar. The Platform also has the largest number of congressionally directed projects. As a group, these underperformed the average by a wide margin. The congressionally directed projects were often poorly aligned with the Program goals.

Range Fuel's very public fall cast a long shadow on the Program and this Platform. Range Fuels did not participate in the review process, and there is little information that is available publicly concerning the matter. Such failures should generate some level of introspection within the Program's management and a continued focus on returning the maximum value in the event of a failure. It seems that little ever will be known about the exact causes of the failure of Range Fuels IBR project. Future failures, if and when they occur, should be positioned to provide better documentation. The Peer Review Panel was assured that "lessons learned" were captured, but no details were provided. All efforts should be taken to make what is learned from Program failings as transparent as possible. The Panel recommends that DOE prepares for large-scale project failures, such as Range Fuels, in the future by having provisions in contracts that allow for the release of information in the event that projects fail to meet their obligations.

The review process for the IBR Platform is rigorous and well applied, with highly experienced industrial engineers applying their knowledge from commercial-scale efforts. The Range Fuels failure, while warranting some introspection, is not an indication of a systemic failure of the funding process.

Infrastructure

The majority of comments about the Infrastructure Platform concerned its demise within the Program. The consensus opinion among reviewers is that the Platform appears to be doing important work determining how to supply biofuels to the marketplace, for example dealing with the blend wall and gasoline-ethanol blends. Upon clarification from DOE, it is clear that the Program goals and mission are not in question. What is under debate is which government agency should have responsibility. Achieving the goals of the Infrastructure Platform will require leveraging the resources of federal agencies, national laboratories, and state and local governments, as well as partners in industry, academia, and other affiliated organizations. While it is clear that inter- and intra-agency collaborations will be essential to the widespread development of biofuels infrastructure, it is not clear that the Program can achieve its mission without remaining actively involved in infrastructure developments and activities. The Panel sees merit in the activities conducted in the Infrastructure Platform and appreciates the need for inter-and intra-agency transition of these activities. The Panel recommends a seamless transition of these activities and that the Program remain involved and up-to-date on the progress in this critical area. Along with the aforementioned Panel recommendation that “future reviews incorporate an overview of the emerging concepts from the Office of Science to provide a better understanding of the technology pipeline,” it should also be noted that future reviews should incorporate updates on infrastructure issues that are relevant to the advancement of biofuels in the marketplace from the federal agency/agencies to whom the infrastructure responsibilities are transitioned.

Biochemical Conversion

The Biochemical Conversion Platform is one of the most mature, and it has many commendable traits. Companies that it supported have now transitioned products developed with DOE assistance to the commercial realm. This is certainly true of the saccharification enzymes that are now commercially available. The “feedstock interface” projects within the Platform, those focused on biomass-to-sugar conversion, are clearly important for the future shift toward drop-in fuels or bioproducts.

The Platform has shown an ability to refine its project slate by expanding its portfolio with projects that involve commercial application or by elimination of projects that plateau short of the Platform goals or by comparison to other projects within the Platform. A good example of this is the Platform’s reduced emphasis on novel microbes, as viable microbes have been developed and are available with sufficient performance to meet Program objectives.

The Platform Review Panel was split by views on fundamental versus applied science. Questions concerning the quality of the science were largely discounted as a minority view by the Peer Review Panel. In the view of most of the Peer Review Panel, the Platform appears to be well managed and meets Program objectives. The culling and refinement of the Program through the years is an example of how to appropriately manage an R&D portfolio.

The impact of the movement of the Program toward drop-in fuels, bioenergy, and bioproducts on this Platform is uncertain. It does not appear that the Platform is particularly well-suited for drop-in fuels as much of the focus continues to be on ethanol. The shifting focus may well present rocky shoals for this Platform.

Thermochemical Conversion

The Thermochemical Conversion Platform, like the Biochemical Platform, is one of the most mature. The Platform also has many commendable traits. Companies that it supported have now transitioned products developed with DOE assistance to the commercial realm. Ineos Bio is now constructing facilities based upon work nurtured by the Program. The Platform is well positioned to move toward drop-in fuels because a number of projects already have focused on producing drop-in fuels. Bioproducts similarly may be well positioned but less developed at this time.

The Platform has shown an ability to refine its project slate by expanding its portfolio with projects that involve commercial application or by elimination of projects that plateau short of the Platform goals or by comparison to other projects within the Platform. This is the case with the emphasis on pyrolysis processing. These projects now make up a significant fraction of the Platform and were almost non-existent in 2007. This technology area shows the potential to produce the lowest-cost biofuels based on DOE techno-economic analysis.

In the view of the Peer Review Panel, the Platform appears to be well managed and meeting Program objectives. The refinement and redirection of the Platform through the years is a good example of how to appropriately manage an R&D portfolio.

The Platform seems particularly well positioned to seize the opportunity presented by the movement of the Program toward drop-in fuels, bioenergy, and bioproducts. The basis in gasification bodes well for biopower applications, as the projects have proven ability to produce drop-in fuels and interesting chemical products. This Platform shows considerable promise to meet Program goals and is in good shape for the future. The Platform should continue to evaluate and refine the slate of projects. This presents challenges on defining metrics to indicate giving up on less promising technologies and, equally important, determining when the private sector has seized development sufficiently that Program support is no longer warranted.

Analysis

The work of the Analysis Platform is critical to decision-making across the Program. The Analysis Platform relies heavily on several types of models, from greenhouse gas models to general economic models of global agriculture and energy to models of agricultural systems. The Panel felt that the objectives supported by each modeling effort are not clear and that consistent assumptions and boundaries are not being used across models. The Platform needs an overall review of the modeling effort and should down-select to the most useful models based on overall Program needs. Additionally, reviewers felt there was a need to expand the analysis effort to include larger economic questions related to market development, trade, and other factors critical to the success of biomass energy.

The Platform's use of techno-economic analyses and benchmarking are excellent. However, some Panel members felt that the scope of the analytical research should be expanded to include a more comprehensive set of socioeconomic obstacles to adoption and diffusion of biomass-based products. In particular, the Program would benefit from a more fundamental understanding of the business and social barriers to achieving the commercial ramp-up of commercial production of advanced biofuels.

- Analyses and pathway-directed research do not fully address the competition for resources and allocation of biomass fractions to highest and best uses among the fuel, products, and power continuum.
- There remain significant “bigger picture” gaps in the Program portfolio related to the interactions of sustainable production and economic behavior. Behavioral questions of how farmers will respond to biomass markets in a larger context of agricultural and energy policy, commodity crop production incentives, and land-use competition, for instance, are fundamental to understanding how feedstock and biofuel markets are likely to develop and what incentives, if any, will be required to make them sustainable.

Sustainability

The Panel was pleased to see the progress in the newly initiated Sustainability Platform. The Feedstock Platform effort in this area prior to formation of the Sustainability Platform made this initial progress possible. Management was clear about directions for the Platform, the need for large-scale, watershed-level analysis was evident, and the incorporation of metrics for sustainable production into IBR projects was a very good sign.

Of note is the funding of new projects designed to test the hypothesis that large-scale production of biomass from new, herbaceous energy crops would be environmentally beneficial in many ways. The Panel considered it important that funding of these projects—particularly the effort in Tennessee with several thousand acre switchgrass production—should continue. Perhaps information gathered from this effort could be used to address some of the questions related to farmer behavior, product and cultivation adoption, and crop production.

The Panel felt strongly that sustainability metrics should be incorporated across all the platforms. Of particular importance is that the analysis of biomass and its availability should be conducted with the following characteristics: biomass yields and systems that are (or could be) sustainable, the conditions under which such sustainable practices will be adopted, and whether the sustainable practices are effectively implemented. Any deviations from these would cause the biomass yield to be unsustainable. This is a key issue for coordination between the Analysis and Sustainability platforms. Coordination with USDA is critical to maximize value from substantial efforts planned through National Institute of Food and Agriculture funding and Biomass Research Centers on sustainable production systems. Checks and balances by the stakeholder industries must be integrated in the Analysis and Sustainability platforms.

Feedstock

The Feedstock Platform continues to address the interface between the production of biomass and the conversion of biomass, with production even less a focus of the Program than before, as the USDA has taken over more of that effort. Coordination between DOE and USDA is critical to the success of the Program and the Feedstock Platform and to ensure that funds are not used in duplicative efforts. The Logistics Sub-Platform, which includes harvest, collection, storage, preprocessing, and transport, are critical elements in moving from growing the feedstock to converting it in the biorefinery. DOE's vision that densification and commodification of biomass streams (part of the preprocessing step) are fundamental to the emergence of a robust bioenergy industry is excellent, but that vision must be shared by other agencies and industry if it is to be proven. The next two years seem to be critical for this vision to be tested at a substantial scale, but challenges remain for producing a commodity stream that is useful for both biochemical and thermochemical conversions. The chemical and biochemical composition of processed and densified materials must be evaluated to provide a set of standardized specifications that will support the growth of the industry.

Given the importance of biopower production to break the "catch-22" in which the industry finds itself, the Feedstock (Logistics) Platform may be the right place to test methods, such as torrefaction, as a strategy for producing a commodity stream from agricultural and woody residues as well as purpose-grown biomass.

Algae

The Algae Platform was resurrected just recently, and, so far, the Panel was only able to judge the setup of the Platform and the project structure of the Platform. To the extent that the Algae Platform is meant to contribute to addressing the EISA targets by 2022, the Panel was very skeptical of its value, considering the current cost projections and likely timeframe for moving down the cost curve. To the extent that overall Program management sees this Platform as contributing largely to a bioproducts component of "replacing the full barrel," the Panel was more positive toward its value. Several members of the Panel recommended that the Platform be more clearly prioritized and structured to focus on nearer-term bioproducts efforts to the extent that new funding will be added in additional requests for proposals. In the meantime, the Panel felt strongly that the current effort be subject to significant down-selection in the next year, with well-defined criteria, for both the individual projects in the Platform and the projects in the consortia efforts.

One area of particular concern is that the projects were not adequately taking into consideration prior results in algae production systems, despite the fact that there is a long history of efforts to use algae to produce biofuels and bioproducts. The Panel recommended that Platform management assure that the best prior information is brought to bear in managing the Platform portfolio, particularly in light of setting appropriate expectations and realistic targets.

Improving the Peer Review Process

The review process does some things quite well. The reviewers, by and large, were well selected and performed admirably. Sessions were interactive and likely represent a reasonable compromise of time required and thoroughness of review. Program leads did a reasonable job of preparing themselves, the Review Panels, and the Principal Investigators (PIs) for the process. The majority of speakers stuck to the prescribed format and provided the requested information.

This year's peer review clearly showed the inadequacies of the quantitative aspect of the review process by using two Review Panels for the IBR review. The result was the emergence of different score distributions from two equally qualified Panels of experts, each reviewing half of the IBR projects, which revealed an inability to apply an "absolute" score across platforms, let alone within a platform. The value of individual project scores and how the scores are used must be re-evaluated, and these scores should not be used to compare the quality of projects between platforms.

The majority opinion supports the view that too much time is spent trying to determine a numerical project score that, once generated, has little relevance or use. There is no forced ranking required because great projects are not rewarded, just as poor projects are not penalized. The attempt to provide numeric scoring provides the illusion of precision, yet this year's IBR Review showed how inexact the scoring is through the use of two Panels. Other platforms had wide variation in scores within a single category for a specific project, again showing that qualified reviewer opinions can vary significantly on a single project.

A key issue realized in this review is that discussion among the reviewers is to be encouraged and fostered. This discussion is not to drive to a consensus, but to ensure similar interpretation of whatever scoring mechanism is deemed necessary. The platform managers commonly say that the comments made about the projects and platforms are more important than the numerical scores. Discussion is also the key to generating a coherent view of any platform and the platform's portfolio—a necessary component of the review process.

The minority view is that scoring protocols need refining and there should be less discussion to ensure a non-biased review. Use of the FOA proposal scoring method that the Golden Office uses for merit reviews was suggested. In this approach, numeric scores must be linked to significant and minor strengths and weaknesses. For example, if a project has no significant strengths or has significant weaknesses, it cannot receive a score of 9 or 10. This approach provides a better link between comments and scores and tends to provide more differentiation between well performing and poor performing projects. A suggestion was made to consider the employment of alternative peer review methodologies, including the use of professional facilitators to work with reviewers to gather high-level review comments and obtain more refined quantitative results.

Confusion about what is most important in the review process remains; therefore, the role of the reviewers

within the context of the Program Review is still inadequately defined. If the review of each individual project is most important, improvements to increase interactions with PIs, and creating time to more fully understand the projects is a likely outcome. If, however, the main purpose is to review the overall Program strategy and structure by first viewing the projects in order to form a bigger picture of platform content, the task becomes something very different. Most Peer Review Panel members seem to feel that the comments about the Program are most important and that the time spent on numerical scoring doesn't directly yield a better review. Furthermore, the time required is already long, and slowing down the process to allow a more detailed project-by-project review will likely reduce the Review Panel pool significantly.

The majority view of the Peer Review Panel is that the level of project review is adequate, the platform managers get appropriate input to help them manage their platforms, and the most important outcome is the comments about the platforms and the Program. Perhaps input from the platform managers on the value of project review should be solicited and considered when planning future Peer Reviews.

The majority view is that simplified scoring and more focus on comments should be instituted. Because the platforms represent a managed portfolio of projects, a three bucket scoring system representing "fully meets," "partially meets," or "is failing to meet" expectations seems adequate.

Communication prior to meetings is the key. It is clear that several reviewers across the Panels were reviewing against different criteria. In some cases, the reviewer was not judging the project against its goals, but sought to comment on the merits of the initial funding. Communication is seen as the mechanism to correct this issue, but consideration could also be given to maintaining a higher percentage of returning reviewers from year to year. This would make it less frequent that the reviewer would let prior information impact the project review and scoring. The review process must be based on information presented, not on information gathered through other means.

The Steering Committee has an important role, and an in-person steering team meeting is warranted prior to kicking off the review season to ensure an improved and more useful review result. This should involve the program and platform managers in order to set expectations and ensure consistency, choose reviewers, and discuss meeting logistics.

Several Panel members noted that it was not clear from the platform and program manager presentations how the platforms were performing in terms of meeting the MYPP specific goals. For instance, the connection between Program and the stated cost/volume goals was not clear. The overall Program metrics, which are needed to meet Program goals, were barely mentioned in the Program Manager's presentations. In future reviews, the Steering Committee should provide some specific guidance for program and platform managers regarding the types of information that would help with review process, including platform objectives, the perception of existing obstacles that has guided distribution of funding, how the assessment of obstacles has changed with the evolution of the industry and research conducted to date, and how the portfolio of projects fits into a strategy to overcome those obstacles.

The review tool itself worked adequately, though a range of comments on its improvement were heard. It may well be that a simplified scoring method, and incorporation of comments back to BCS on the scoring tool, would support improvement of the review tool and process. Less emphasis on numerical scoring would shift the focus to more emphasis on comments, as the platform managers indicate is more useful than a single numerical score.

This review season marked the first time that the review has been broadcast over the Web. This was viewed favorably by the Steering Committee members and the Platform reviewers. In addition to members of the public being able to view the live presentations, one reviewer and one presenter were effectively able to participate remotely. AV issues were a common occurrence and an area where improvement should be stressed. While many of these issues can be attributed to the venues, these issues should be addressed as necessary to ensure the quality of the meetings. It should also be stated in any webinar announcements and at the start of the meeting that the public will not be able to interact (e.g., ask questions) and will be in listen-only mode. The public, in-person meeting is still desired and recommended for the future.

Meeting logistics were generally adequate with a few notable exceptions. The availability of the BCS staff to help with content, answer questions, provide guidance, and keep things on track and organized was truly stellar. The Forrestal Building proved to be a difficult venue for these kinds of meetings and should not be used again. Finally, there were a number of problems with meeting logistics being approved at the last minute. As a result, travel authorizations from Golden Office were equally impacted, and reviewers were sometimes required to make last-minute arrangements, which impacted overall travel costs and added a layer of stress on those asked to travel. The overhead required to be a reviewer is not insignificant, and last-minute meeting arrangements significantly added to the price of airline tickets. These types of institutional hassles have the potential to limit the pool of candidates willing to participate. In addition to their responsibilities as reviewers, they also had to make airline, local travel, and lodging arrangements and cover these expenses, as well as pay for meals and incidental expenses. Reviewers were pleased with the quick reimbursements, but every effort should be made to ensure that out-of-pocket outlays are minimized and meetings are all approved at least 30 days prior to the meeting dates.

Attachment One: Basic Steps in Implementing the Biomass Program Peer Review

1. Biomass Program establishes internal planning team to organize and implement Program Review. Team meets weekly starting in August 2010.
2. Steering Committee of external, independent experts is formed and begins meeting biweekly starting October 2010. Committee provides recommendations and guidance for designing and implementing the review, scope of the review, presentation templates, review forms, and overall content and structure of the evaluation.
3. The Program's RDD&D and analysis project portfolio is organized by the eight platform areas.
4. A Lead is designated for each platform review. Platform Review Leads are responsible for all aspects of planning and implementation, including coordinating the Review Panel, coordinating with PIs, and overall planning for the platform review. Platform Review Leads are invited to participate in an internal Peer Review Committee, which holds regular conference calls to discuss relevant matters.
5. Each platform identifies projects for review. The target was to review at least 80% of the Program budget.
6. Draft project-level, platform-level, and Program-level evaluation forms are developed for the 2011 platform review meetings. Similarly, draft presentation template and instructions are developed. EERE Peer Review Guidelines and previous forms are evaluated in developing the drafts. Forms are reviewed and modified by the Steering Committee before being finalized.
7. Each DOE Platform Lead identifies candidate members for the respective platform Review Panel. Peer Review Lead requests Steering Committee feedback of candidate reviewers. Available biographies are provided to the Steering Committee for review. Committee provides recommendations on candidates, and in some cases alternate candidates. Results provided to DOE Platform Leads for consideration in final selection of Review Panels.
8. Upon confirmation, Review Panels are provided background information on the review, evaluation forms, presentation templates, and other information needed to perform duties. Golden Office was involved in the registration of reviewers and execution of required forms, such as Conflict of Interest forms. At least one conference call is held for each Review Panel to provide instructions, discuss Panel member responsibilities, and address any questions. To the extent possible, Steering Committee members participate in those calls.
9. Biomass Program performs outreach to encourage participation in each of its platform review meetings by sending announcements to more than 3,000 Program stakeholders. The Program Reviews are also announced on the Biomass Program website.

10. Platforms invite PIs to present their project(s) at the platform review. PIs are provided with presentation templates and instructions, reviewer evaluation forms, and background information on the review process. Follow-up calls are held with PIs to address questions. If PIs chose not to present, the Program requested that they submit a form stating such.
11. Platform review meetings are held according to guidelines. At least two members of the Steering Committee participated in each review to ensure consistency and adherence to guidelines.
12. Review Panel evaluations are completed using a Web-based automated tool. These evaluations are available 24/7 to reviewers via a password-protected website, and following each review, Panel members were provided approximately 14 working days to update and edit their comments. PIs are then provided approximately 14 working days to go to the same password-protected website, review comments on their projects, and respond to Review Panel evaluations.
13. Results of review panel evaluations and PI responses are provided to each DOE Platform Review Lead for response.
14. A Program Review Panel is formed, comprised of the Steering Committee and the Lead Reviewer from each Platform Review Panel.
15. A series of conference calls are held with Program Review Panel to provide background and instructions for the program review meeting.
16. Draft platform review reports, including Biomass Program responses, are provided to the Program Review panel for review in advance of the June Program Review meeting. To the extent possible, presentations were provided in advance.
17. Program Peer Review meeting conducted June 2011.
18. Program Review Panel submits completed Web-based program review evaluation forms approximately one week following the review. Steering Committee submits evaluation on the quality and objectivity of overall Program Review process. These responses are used to draft the Program Peer Review Summary Report.
19. Program Peer Review Summary Report is provided to Biomass Program for review and response.

Attachment Two: Program Review Agenda

Time	Project Title	Designated Speaker
Date: 6/26/2011		
6:00 p.m. – 8:00 p.m.	CLOSED SESSION: Program Review Panel (Steering Committee and Lead Reviewers)	
Date: 6/27/2011		
7:00 a.m. – 8:00 a.m.	Registration and Continental Breakfast	
PROGRAM MANAGEMENT OVERVIEW		
8:00 a.m. – 8:20 a.m.	2011 Process Overview (Presentation)	Neil Rossmeissl, IBR Technology Manager, Biomass Program
8:20 a.m. – 9:05 a.m.	Biomass Program Overview (Presentation)	Paul Bryan, Program Manager, Biomass Program
9:05 a.m. – 9:20 a.m.	Q&A Period	
9:20 a.m. – 9:35 a.m.	Break	
CROSCUTTING ACTIVITIES		
9:35 a.m. – 10:05 a.m.	Analysis Platform Overview (Presentation)	Zia Haq, Senior Analyst, Biomass Program
10:05 a.m. – 10:35 a.m.	Analysis Platform Lead Reviewer Report (Presentation)	Kelly Ibsen, Analysis Lead Reviewer, Lynx Engineering, LLC
10:35 a.m. – 10:55 a.m.	Q&A Period	
10:55 a.m. – 11:25 a.m.	Sustainability Platform (Presentation)	Alison Goss Eng, Sustainability Technology Manager, Biomass Program
11:25 a.m. – 11:55 a.m.	Sustainability Platform Lead Reviewer Report (Presentation)	Alison Brady, Sustainability Lead Reviewer, Life Cycle Management
12:25 p.m. – 1:55 p.m.	Lunch (Provided)	

PROGRAM REVIEW COMMENTS

Time	Project Title	Designated Speaker
REVIEW OF BIOMASS PROGRAM R&D PLATFORMS		
1:55 p.m. – 2:15 p.m.	Feedstock Production (Presentation)	Laura McCann, Feedstock Technology Manager, Biomass Program
2:15 p.m. – 2:35 p.m.	Feedstock Logistics (Presentation)	Sam Tagore, Technology Manager, Biomass Program
2:35 p.m. – 3:05 p.m.	Feedstock Platform Lead Reviewer Report (Presentation)	Jim Dooley, Feedstocks Lead Reviewer, Forest Concepts
3:05 p.m. – 3:25 p.m.	Q&A Period	
3:25 p.m. – 3:55 p.m.	Algae Platform Overview (Presentation)	Joyce Yang, Technology Manager, Biomass Program
3:55 p.m. – 4:25 p.m.	Algae R&D Reviewer Report (Presentation)	Tryg Lundquist, Algae Lead Reviewer, CAL POLY
4:25 p.m. – 4:45 p.m.	Q&A Period	
4:45 p.m. – 4:50 p.m.	Closing Remarks and Meeting Adjournment	Neil Rossmeissl, IBR Technology Manager, Biomass Program
4:50 p.m. – 6:20 p.m.	CLOSED SESSION: Private Reviewer Discussion Period	

Date: 6/28/2011

7:00 a.m. – 8:00 a.m.	Registration and Continental Breakfast	
8:00 a.m. – 8:10 a.m.	Opening Remarks	Neil Rossmeissl, IBR Technology Manager, Biomass Program
REVIEW OF BIOMASS PROGRAM R&D PLATFORMS (Cont'd)		
8:10 a.m. – 8:40 a.m.	Biochemical Overview (Presentation)	Leslie Pezzullo, Biochemical Platform Lead, Biomass Program
8:40 a.m. – 9:10 a.m.	Biochemical Review Results (Presentation)	Mike Penner, Biochemical Lead Reviewer, Oregon State University
9:10 a.m. – 9:30 a.m.	Q&A Period	
9:30 a.m. – 9:45 a.m.	Break	

Time	Project Title	Designated Speaker
9:45 a.m. – 10:15 a.m.	Thermochemical Overview (Presentation)	Paul Grabowski, Technology Manager, Biomass Program
10:15 a.m. – 10:45 a.m.	Thermochemical Review Results (Presentation)	Steve Kelley, Thermochemical Lead Reviewer, North Carolina State University
10:45 a.m. – 11:05 a.m.	Q&A Period	
11:05 a.m. – 12:35 p.m.	Lunch (Provided)	
REVIEW OF BIOMASS PROGRAM DEPLOYMENT PLATFORMS		
12:35 p.m. – 1:05 p.m.	Infrastructure Overview (Presentation)	Shabnam Fardanesh, Infrastructure Platform Lead, Biomass Program
1:05 p.m. – 1:35 p.m.	Infrastructure Review Results (Presentation)	Albert Hochhauser, Infrastructure Lead Reviewer, Transportation Fuels Consultant
1:35 p.m. – 1:55 p.m.	Q&A Period	
1:55 p.m. – 2:15 p.m.	Break	
2:15 p.m. – 2:45 p.m.	IBR Overview (Presentation)	Neil Rossmeissl, IBR Technology Manager, Biomass Program
2:45 p.m. – 3:15 p.m.	IBR Review Results (Presentation)	George Parks, IBR Lead Reviewer, Fuel Science
3:15 p.m. – 3:45 p.m.	Q&A Period	
OPEN PROGRAM REVIEW PANEL FEEDBACK AND DEBRIEF PERIOD		
3:45 p.m. – 4:55 p.m.	PROGRAM REVIEW PANEL FEEDBACK AND DEBRIEF	Program Review Panel
4:55 p.m.–5:05 p.m.	Closing Remarks	Neil Rossmeissl, IBR Technology Manager, Biomass Program
5:05 p.m. – 5:10 p.m.	Meeting Adjournment	

COMPENDIUM INFORMATION

1. Biomass Program MYPP: http://www1.eere.energy.gov/biomass/pdfs/mypp_november_2011.pdf
2. Peer Review Portal Website Peer Review Page: http://www.obpreview2011.govtools.us/intro_page.htm
3. IBR Platform Review: www.eere.energy.gov/biomass/pdfs/2011_ibr_review.pdf
4. Infrastructure Platform Review: www.eere.energy.gov/biomass/pdfs/2011_infrastructure_review.pdf
5. Biochemical Conversion Platform Review: www.eere.energy.gov/biomass/pdfs/2011_biochem_review.pdf
6. Thermochemical Conversion Platform Review: www.eere.energy.gov/biomass/pdfs/2011_thermochem_review.pdf
7. Analysis Platform Review: www.eere.energy.gov/biomass/pdfs/2011_analysis_review.pdf
8. Sustainability Platform Review: www.eere.energy.gov/biomass/pdfs/2011_sustainability_review.pdf
9. Feedstock Platform Review: www.eere.energy.gov/biomass/pdfs/2011_feedstocks_review.pdf
10. Algae Platform Review: www.eere.energy.gov/biomass/pdfs/2011_algae_review.pdf

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