2013 DOE Bioenergy Technologies Office Project Peer Review

Energy from Biomass Research and Technology Transfer Program ("ERTT")

Date: May 23, 2013
Technology Area Review: Feedstock Supply & Logistics

Principal Investigator: Dorin Schumacher, Ph.D.
Organization: The Consortium for Plant Biotechnology Research, Inc. ("CPBR")

Goal Statement

- The primary goal of EBRTT is to foster and facilitate research and technology transfer leading to technologies that will transform the United States' abundant biomass resources into clean, affordable, and domestically produced biofuels and high-value bio-products.

- The results will be economic development, energy supply options, energy security and good new jobs. Activities will contribute to the expansion of a new bio-industry and will reduce U.S. dependence on foreign oil by supplementing the use of petroleum for fuels and chemicals.

Quad Chart Overview

Timeline

- Start date: October 1,2001
- End date: December 31, 2013
- Percent complete: 95%

Technical Targets

- Project-by-project (selected through annual competitions)
- Industry partner involvement
- Project management and reporting

Budget

- DOE funding for FY11: $0
- DOE funding for FY12: $0
- DOE funding for FY13: $0
- Years the project has been funded : 9
- Average annual funding: $2.5 MM

Partners

- CPBR's industry and university members (next slide)

CPBR Industry and University Membership

Company Members
Archer Daniels Midland Company
BASF Plant Science, LLC
Bayer CropScience ButylFuel, LLC
Cellectis Plant Sciences
Corn Marketing Program of Michigan
D-Helix
Dow AgroSciences, LLC/AgroFresh, Inc. DuPont Agricultural Biotechnology
FuturaGene, Inc.
Hawaii Agriculture Research Center
Huntsman International, LLC
Iowa Soybean Association
Mascoma Corporation
MeadWestvaco Corporation
Minnesota Soybean Research & Promotion Council Monsanto Company
SuGanit Systems, Inc. Syngenta Technology Crops International The Peanut Foundation
UniSouth Genetics, Inc.
United States Golf Association

University Members
AgriLife Research - Texas A&M System
Arkansas State University
Clemson University
Dartmouth College
Donald Danforth Plant Science Center Florida State University
Georgia Institute of Technology
Indiana University
Iowa State University
Kansas State University
Louisiana State University
Michigan State University
Michigan Technological University
Montana State University
New Mexico State University
North Carolina State University
North Dakota State University
Northwestern University
Oregon State University
Pennsylvania State University
Purdue University
Rutgers, The State University of New Jersey
South Dakota State University
Southern Illinois University
State University of New York
Syracuse University
The Ohio State University
University of Chicago
University of Colorado
University of Connecticut
University of Florida
University of Georgia
University of Hawaii
University of Illinois
University of Iowa
University of Kentucky
University of Massachusetts
University of Michigan
University of Minnesota
University of Missouri
University of Nebraska
University of Tennessee
University of Toledo
University of Washington
University of Wisconsin

Affiliated Universities
Alabama A&M University
Albany State University
Florida A&M University
Hampton University
Kentucky State University
North Carolina A&T State University Savannah State University
Tuskegee University
University of Puerto Rico
University of the Virgin Islands
Virginia State University
West Virginia State University

Project Overview

- CPBR projects are selected through a rigorous competitive process that includes an **industrial review for practical applications** and **peer review for scientific merit**.
- On average, the projects are matched 130% with non-federal matching, of which industry provides over 50% in **cash.** The industry cash matching insures the economic value of the research.
- CPBR has funded over 165 research projects under this grant with more than $41MM.

1a - The CPBR Competition Process

- Pre-RFP activities
  - Poll industry partners for their research interests
  - Outline DOE BETO interests for that year
  - Develop competition timetable
- Call for preproposals
  - Write RFP for distribution
  - Update contacts on distribution list
  - Distribute RFP to over 5000 member university contacts
- Industry member’s review of preproposals
  - Collect and review preproposal submissions for relevance to competition areas of interest
  - Sort and assemble preproposals into a Preproposal Book for evaluation
  - Distribute the Preproposal Book to industry members for evaluation
- CPBR symposium
  - Plan and coordinate the competition preproposal poster presentations
  - Register industry representatives and preproposal PIs for the meeting
  - Schedule scientific presentations on completed projects
  - Plan networking events

1b - The CPBR Competition Process

- Registration of Interest by Industry Partners
  - Following the symposium, compile company Registrations of Interest (R of I means a company wishes to talk further with a PI regarding the proposed work for possible matching)
  - Review industry partner evaluations and rank order
- Request for full proposals from PIs for peer review
  - Put together proposal request list based on company evaluations
  - Develop grant application materials
  - Invite full proposals and distribute grant application materials
  - Coordinate receipt of proposals
- Submission of proposals for peer review
  - Recruit peer reviewers
  - Match reviewers to proposals through keywords and other means
  - Distribute proposals to reviewers
  - Following peer review, the results are sorted and summarized in a spreadsheet format for Project Recommendation Committee reference.

1c - The CPBR Competition Process

- Submission of proposals to Scientific Consultants for review
  - Invite Scientific Consultants
  - Match Scientific Consultants to proposals
  - Distribute proposals and peer review documents to them
  - Compile their evaluations
- Industry Cash Match documented
  - Cash matches are agreed to between the Industry member representatives and PIs and reported to CPBR in writing
  - Matching information is put into the spreadsheet format for the Committee
- Project Recommendation Committee Meeting
  - Plan and coordinate Project Recommendation Committee Meeting
  - Invite companies that are not matching to serve
  - Prepare and distribute proposal and peer review documents for Committee review
  - Conduct meeting at which proposals are ranked and evaluated by Committee
  - Communicate competition results to PIs, university representatives, and representatives of match sources.

1d - The CPBR Competition Process

- NEPA review and evaluation
  - Provide NEPA Consultant with proposals approved for funding by Committee
  - Proposals reviewed by NEPA consultant
  - Collect NEPA recommendations
- DOE NEPA approval request
  - Request DOE approval of NEPA compliance of Committee-selected projects
- CPBR Board approval
  - CPRB Board reviews and approves for funding the Committee-selected and DOE-NEPA-approved projects
- Research Agreements are issued
  - Research Agreements are prepared and sent to the project universities for execution.

2a -Post Award Management Activities

- Initiate and administer subgrant Research Agreements and amendments to Agreements
- Maintain project files
- Monitor subgrant activities
- Pay university invoices
- Year Two Application Process
  - Application packets are sent to project PIs nearing completion of Year One
  - The PI makes an application for funding of Year Two
  - Matrix reports are provided by the industry sponsors reporting the value and successes of Year One
  - The Year Two application and matrix report are provided to the original Scientific Consultant for review and recommendation
  - If recommended for funding of Year Two, the Research Agreement is amended
  - Following receipt of an executed Year Two Amendment, funds are released for Year Two
- Process NCEs
- Update DOE semiannual reports

2b -Post Award Management Activities

- Fiscal reporting
  - SF 425
  - MFER
  - SF 270
  - 7621
- Document patents and publications results
- Scientific reports are requested, provided by the PI and compiled for submission to DOE on a semiannual basis
- In accordance with OMB circular 144, CPBR requests annual audit reports from all participant universities and reviews them for findings and concerns related to CPBR's federally funded projects
- Matrix reports (reports used by industry members to evaluate and document the market value and importance of a research project and the quality and frequency of company-PI communications) are requested. The data in the reports are put into a spreadsheet format for reference.

3 -Publications

- 2,360 publications have resulted from the 494 CPBR projects funded by various sources since 1989.
- Obtain and record IP results from PIs and/or their universities, including disclosures, patent applications, patents issued, licenses and active licenses
- Obtain and record publications results from PIs

4a -Commercialization

- As of 2009, CPBR-funded research projects' average US patent/federal dollars rate was 3687% higher than the average US patent/federal dollars rate of the 191 US universities reporting in the AUTM survey of 2009.
- CPBR-funded research projects' average US patent/federal dollars rate was 270% higher than NREL's patent/federal dollars rate.
- CPBR-funded projects' cumulative active license rate was 5452% higher than US universities' cumulative active license rate.
- CPBR-funded projects' publication/federal dollar rate was 90% higher than US universities' 44 percent, as reported by NSF.

4b – Technology Transfer

CPBR's IP Results as of 7/11/11

• US Patents Granted	112
• Foreign Patents Granted	24
• Patents Pending	116
• Additional Disclosures	39
• Start-Up Companies (known)	5
• Total Licenses	274
• Total Licenses Currently Active	212
Total Projects	**494**

5 - Matching Funds

CPBR projects are matched an average of 130% with non-federal matching, of which industry provides over 50% in cash. This industrial investment proves the economic value of CPBR research.

6 - Job Creation

- It is estimated that more than 500 new jobs have been created each of the years that CPBR has received DOE funding. Thousands more have been created upon commercialization of the results of CPBR's renewable energy sub-awards research.
- Direct job creation nationwide from advanced biofuels production could reach 94,000 by 2016 and 190,000 by 2022. Many of these will be in rural America.
- Total job creation--accounting for economic multiplier effects--could reach 383,000 in 2016, and 807,000 by 2022.
- Job creation will be directly affected by continued CPBR funding and the private investments in advanced biofuels industries that will be built on CPBR projects' technologies

7 - Annual Audits

- CPBR, in compliance with OMB requirements, undergoes annual audits.
- The audits are performed by third party vendors
- For audit years FY11-FY12, Rubino & Company, Chartered performed the Annual Audit.
- No findings have been reported.

8 - Why should these federal dollars go to CPBR for disbursement instead of to BETO for disbursement?

- Industry helps set the CPBR research agenda, within its federal sponsors' frameworks
- The CPBR Competition Process gets industry investment at the beginning stages of the research, thus a company is ready and waiting to commercialize what comes out of the laboratory
- Industry cash matching insures industrial relevance and practical applications
- CPBR commercialization and scientific publications results far exceed what universities and federal laboratories achieve

9 - Critical Success Factors

- CPBR has received no new DOE funding for the projects recommended for awards in its 2011, 2012, and 2013 competitions

- 27 proposals have been peer reviewed, reviewed by Scientific Consultants, have industry matching funds commitments, have been recommended for funding by the Project Recommendations Committees, and are awaiting CPBR ERTT funding

- Federal dollars are needed to leverage the private sector dollars

10. Future Work

- As of the date of the publication of this report no further funding from DOE BETO has been provided to fund projects from the 2011, 2012, and 2013 CPBR competitions.

- CPBR will continue to manage the 23 previously funded in-process ERTT projects until completion.

- CPBR continues to conduct competitions in hopes of receiving further funding.

Summary

1) The CPBR Competition and Process are successful market-driven approaches for that DOE BETO can brag about.
2) 252 Patents, 274 Licenses, and 2360 Publications have been provided through the federal and non-federal funding of CPBR.
3) The results are more than 3000% higher than universities and NREL accomplish by their approaches.
4) CPBR research accomplishes BETO's commitment to developing alternative energy technologies and a bio-based economy.
5) Every $1 of federal funds is matched through CPBR with $1.30 in non-federal funds.
6) 164 projects for a total of over $41 Millions in research have been carried out through this grant.
7) The continued success of this program and its contributions to society depend on further funding from DOE.