

**Request for Information**  
**U.S. Department of Energy**  
**Office of Energy Efficiency and Renewable Energy**

**Demonstration and Deployment Strategies**  
**DE-FOA-0001013**

**DATE:** 10/30/2013

**SUBJECT:** Request for Information (RFI)

**DESCRIPTION:** The Department of Energy (DOE) seeks stakeholder feedback regarding bioenergy technology validation to accelerate the deployment of advanced biofuel, bioproducts, and biopower technologies.

**BACKGROUND:** The Office of Energy Efficiency and Renewable Energy (EERE) leads DOE's efforts to develop and deliver market-driven solutions for energy-saving homes, buildings, and manufacturing; sustainable transportation; and renewable electricity generation. The Bioenergy Technologies Office (BETO) is a key component of EERE efforts to expand the adoption of sustainable, domestically powered transportation alternatives and stimulate the growth of a thriving domestic clean energy manufacturing industry. BETO's mission is to develop and transform our renewable biomass resources into commercially viable, high performance biofuels, bioproducts, and biopower through targeted research, development, demonstration, and deployment supported through public and private partnerships. The goals aligned to this mission are: 1) through R&D, make cellulosic biofuels competitive with petroleum-based fuels at a modeled cost for mature technology of \$3 per gallon of gasoline equivalent (GGE) (\$2011) based on EIA projected wholesale prices in 2017; and 2) help create an environment conducive to maximizing the production and use of biofuels by 2022.

**PURPOSE:** The purpose of this RFI is to solicit feedback from industry, academia, research laboratories, government agencies, and other stakeholders on issues related to advanced biofuel, bioproducts, and biopower technology validation and potential deployment strategies. EERE is specifically interested in information on advanced biofuel, bioproducts, and biopower technologies that are ready for technology validation at a Technology Readiness Level (TRL) of 6 or higher. This is solely a request for information and not a Funding Opportunity Announcement (FOA). EERE is not accepting applications.

**DISCLAIMER AND IMPORTANT NOTES:** This RFI is not a FOA; therefore, EERE is not accepting applications for funding at this time. EERE may issue a FOA in the future based on or related to the content and responses to this RFI; however, EERE may also elect not to issue a FOA. There is no guarantee that a FOA will be issued as a result of this RFI. Responding to this RFI does not provide any advantage or disadvantage to potential applicants if EERE chooses to issue a FOA regarding the subject matter. If DOE chooses to issue a FOA, final details, including the anticipated

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award size, quantity, and timing of EERE funded awards, will be subject to Congressional appropriations and direction.

Any information obtained as a result of this RFI is intended to be used by the Government on a non-attribution basis for planning and strategy development; this RFI does not constitute a formal solicitation for proposals, applications, or abstracts. Your response to this notice will be treated as information only. EERE will review and consider all responses in its formulation of program strategies for the identified materials of interest that are the subject of this request. In accordance with the Federal Acquisition Regulations, 48 C.F.R. 15.201(e), responses to this notice are not offers and cannot be accepted by the Government to form a binding contract. EERE will not provide reimbursement for costs incurred in responding to this RFI. Respondents are advised that DOE is under no obligation to acknowledge receipt of the information received or provide feedback to respondents with respect to any information submitted under this RFI. Responses to this RFI do not bind EERE to any further actions related to this topic.

**PROPRIETARY INFORMATION:** Because information received in response to this RFI may be used to structure future programs and FOAs and/or otherwise be made available to the public, **respondents are NOT to provide any information in their responses which may be considered business sensitive, proprietary or confidential.**

**EVALUATION AND ADMINISTRATION BY FEDERAL AND NON-FEDERAL PERSONNEL:** Federal employees are subject to the non-disclosure requirements of a criminal statute, the Trade Secrets Act, 18 USC 1905. The Government may seek the advice of qualified non-Federal personnel. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The respondents, by submitting their response, consent to DOE providing their response to non-Federal parties. Non-Federal parties given access to responses must be subject to an appropriate obligation of confidentiality prior to being given the access. Submissions may be reviewed by support contractors and private consultants.

## **AREAS OF INTEREST AND QUESTIONS**

The BETO Demonstration and Deployment (D&D) technology area's goal is to reduce the risk of bioenergy production technologies through validated proof of performance at the pilot, demonstration, and commercial scale and to remove any additional barriers to deployment. The D&D goal is achieved through public/private partnerships that build and/or operate integrated biorefineries (IBRs) and through projects focused on infrastructure and end use market barriers. The IBR activities are essential for resolving key issues in the construction and scale-up of advanced bioenergy systems, primarily by reducing risk to help overcome the commercial financing barriers that are currently facing the bioenergy industry. The infrastructure and end use activities are focused on identifying and removing commercial and market barriers that limit the potential of advanced biofuels, bioproducts, and biopower to replace petroleum or other fossil fuels.

BETO's D&D technology area is requesting information on advanced biofuel, bioproducts, and biopower technologies that are ready for technology validation at a TRL of 6 or higher. TRL

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definitions can be found in Section 3-1 of the BETO Multi-Year Program Plan (MYPP) ([http://www1.eere.energy.gov/bioenergy/pdfs/mypp\\_may\\_2013.pdf](http://www1.eere.energy.gov/bioenergy/pdfs/mypp_may_2013.pdf)); TRLs 6-8 generally correspond to pilot, demonstration, and commercial scale biorefinery operations. Technologies considered must be aligned with BETO objectives in the MYPP and are categorized into the Areas of Interest below.

**Areas of Interest 1 through 4 – Conversion Technologies:**

- 1. Drop-in, hydrocarbon advanced biofuels in new or expanded facilities**
- 2. Improvements to specific unit operations or processes for advanced biofuel production in existing facilities**
- 3. Non-fuel bioproducts, such as lubricants or chemicals, that will contribute to "replacing the whole barrel"**
- 4. Advanced biopower, excluding combustion systems that generate steam for heat and power**

**Areas of Interest 5 through 6 – Feedstock Technologies:**

- 5. Feedstock supply and logistics systems for high impact feedstocks<sup>1</sup>**
- 6. Algae utilization, including harvesting, processing, and conversion**

**Areas of Interest 7 through 9 – Enabling Technologies:**

- 7. Early adoption opportunities for advanced bioenergy production such as, but not limited to, renewable home heating oil and renewable marine fuel applications**
- 8. Solids handling systems for pressurized reactor interfaces, such as for biomass feeding or ash and char removal**
- 9. Market barriers such as infrastructure needs or fuel compatibility**

Please submit a response to DOE detailing the advanced biofuel, bioproduct, or biopower technologies that are ready for validation in an operating environment of an integrated facility. The technologies should require minimal development and should not be off-the-shelf or already used commercially. If additional technology development is required, it should be minimal and low risk, with emphasis on engineering required for installing, siting, operating and collecting data from the technologies at the specific site(s) chosen.

Please address the following questions in your response, as appropriate for your technology. **Please do not provide any information which may be considered business sensitive, proprietary or confidential:**

<sup>1</sup> A high impact feedstock is domestically available with the agronomically and ecologically sustainable ultimate availability potential of at least 50 million dry metric tonnes of lignocellulosic biomass per year.

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- Q1. What is the specific advancement over currently available technology/systems? Please describe how this advancement or improvement can be represented along a known or analogous learning curve and how subsequent improvements will be incorporated into commercial production systems?
- Q2. What metrics do you use to measure the advancement over existing technology/systems? Provide support for why you selected those metrics. DOE is seeking only the types of metrics to compare technologies and is not seeking business sensitive, proprietary or confidential performance results.
- Q3. What scale of testing has already been completed, measured in both feedstock throughput and/or volume or mass of product? How many hours or cycles of testing have been completed? Was the testing in an integrated facility that included all of the key process recycle loops and/or heat integration?
- Q4. What next scale of testing is necessary to advance your technology assuming incremental progression through TRLs 6-8, or integrated pilot, to demonstration, to commercial scale?
- Q5. What would be the most efficient and advantageous method for testing this advancement? As a new or improved unit operation in an existing testing facility? Testing in a new test facility? Some other method? Please describe the rationale for your response.
- Q6. What is the optimum feedstock throughput for your technology at this scale? Please report feedstock throughput as tonnes/day; if this is not appropriate for your technology, please explain what metrics you use to define feedstock throughput.
- Q7. What are the main technical barriers for the technology and how will these barriers be addressed?
- Q8. What sustainability (economic, environment, and social) criteria are the most important in terms of site selection for a bioenergy facility? More information on sustainability criteria is available in Section 2.4 of BETO's MYPP.
- Q9. How do you plan to design and operate a biomass feedstock supply system to meet the annual volumetric and quality demands for a commercial bioenergy facility? What are the barriers to integration with a regional supply system to supply multiple bioenergy facilities and how would you overcome these barriers?
- Q10. What financial barriers are you encountering currently and how are you planning to overcome these barriers? If financing is dependent on reducing your technical risk, what metrics are used to determine the risk and how do you measure reduction in risk?
- Q11. Why is it appropriate to use government resources for validation and is government cost share necessary for validation of the technology?
- Q12. What is the enduring benefit to the United States from validating this technology? Please estimate the potential impact of a successful validation, measured in jobs created, return of investment (ROI), or displacement of oil or other fossil fuel.

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For current metrics and technical targets used by BETO, please refer to the appropriate sections of the Office's MYPP: [http://www1.eere.energy.gov/bioenergy/pdfs/mypp\\_may\\_2013.pdf](http://www1.eere.energy.gov/bioenergy/pdfs/mypp_may_2013.pdf)

**RESPONSE GUIDELINES:** Responses to this RFI must be submitted electronically as an attachment to [DDRFI@go.doe.gov](mailto:DDRFI@go.doe.gov) **no later than 11:59 pm EST on December 6, 2013**. Please specify the Area of Interest in your response and answer the appropriate questions for your technology. If you wish to provide input to more than one Area of Interest, you should submit a separate e-mail response for each Area of Interest. Please insert "RFI Response for D&D Strategies" in the subject line of your email.

**Responses must be provided as a Microsoft Word (.doc/docx) or PDF attachment to the email, of no more than 5 pages in length, 12 point font, 1 inch margins, not to exceed 3MB in size. Only electronic responses will be accepted. Responses submitted by any other means will not be considered by DOE. Please do not provide any information which may be considered proprietary or confidential.**

EERE will not respond to individual submissions or publish publically a compendium of responses received from this RFI. A response to this RFI will not be viewed as a binding commitment to develop or pursue the project or ideas discussed.

Respondents are requested to provide the following information at the beginning of their response to this RFI:

- Company/institution name;
- Company/institution contact with address, phone number, and e-mail address; and
- Number and name of Area of Interest.

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