NOTICE

Modifications to this Funding Opportunity Announcement (FOA) may have been made since this version was posted. Applicants are strongly advised to consult the FOA version posted on www.FedConnect.com, the official application website, for the latest changes regarding the application materials, dates, and other requirements.

The FedConnect system can be accessed through the following steps:

1. Go to http://www.FedConnect.net/
2. Click on "Search Public Opportunities"
3. Select "Reference Number" in the Search Criteria drop down box and then enter the Reference Number of the funding opportunity you are interested in (DE-FOA-XXXXXXX), followed by clicking the "Search" button
4. Click on the Title hyperlink after search results are displayed
5. On the right side of the screen, click on "BODY" under the "Solicitation" or "Amendment" folder; if multiple amendments exist, click on the most recent award amendment for the latest changes.

If you are new to the Federal grant application process, it can take 21 days or more to complete all of the registration processes needed to submit questions or application. These activities include acquiring a DUNS number, completing a Central Contract Registration (CCR), and FedConnect.com registration. Hence, if you are considering applying for this or another Funding Opportunity, we recommend beginning the registration process as soon as possible.

For further assistance throughout the application process, contact the following numbers:

- **General inquiries:** 1-888-DOE-RCVY (1-888-363-7289), https://recoveryclearinghouse.energy.gov/
- **Central Contract Registration (CCR) system**: 1-888-227-2423, http://www.ccr.gov/Help.aspx
- **FedConnect**: 1-800-899-6665, support@fedconnect.net
- **Specifics on FOA**: see "Questions" portion of the FOA

FINANCIAL ASSISTANCE

FUNDING OPPORTUNITY ANNOUNCEMENT

U.S. Department of Energy
Golden Field Office

Recovery Act - Demonstration of Integrated Biorefinery Operations

Funding Opportunity Announcement Number: DE-FOA-0000096

Announcement Type: Amendment 002

CFDA Number: 81.087 Renewable Energy Research and Development

Issue Date: May 7, 2009

NOTICE OF INTENT TO APPLY Due Date: May 29, 2009, 11:59 PM Eastern Time

Application Due Date: June 30, 2009, 11:59 PM Eastern Time

Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3393

DE-FOA-0000096
Amendment No. 002

DATE: May 28, 2009

FROM: Henry E. Eggink, Contracting Officer

TO: All Prospective Applicants

SUBJECT: Amendment No. 002 to Announcement No. DE-FOA-0000096, Demonstration of Integrated Biorefinery Operations

The Announcement is amended as follows:

1. The **Adobe Application Package** submission instructions are clarified to ensure submission to FedConnect, not Grants.gov. See attached "Adobe Application Package – Instructions for Completion of Forms" on the following page.

2. The **TOPIC AREA DESCRIPTIONS** section is clarified to state that design, operation, and construction of an integrated biorefinery is allowable in every topic area.

3. The **Summary of Required Forms/Files** table is modified to show a sixty (60) page limit on the "Process Flow Diagram and Supporting Data" application attachment.

All other sections remain unchanged.

Adobe Application Package – Instructions for Completion of Forms

The Adobe Application Package was intended to be utilized in Grants.gov; however, the DOE is currently utilizing it with FedConnect. Please disregard any information within the Adobe Application Package regarding use with Grants.gov; specifically, DO NOT use the "Save & Submit" button in the Adobe Application Package, since that button is only used when submitting an application in Grants.gov.

1) Copy the Adobe Application Package to your desktop.

2) Open the Adobe Application Package, and first complete the SF-424 Application, Project/Performance Site Location(s) form, and SF-LLL form (if applicable) which are all part of the Adobe Application Package. To start this process, simply click on the form's name to select the item and then click on the => button. This will move the document to the appropriate "Documents for Submission" box and the form will be automatically added to your application package. Open the forms by selecting the form name and clicking on the "Open Form" button, then complete the required data fields.

3) Identify the remaining forms required to be completed, as identified in Part IV of the Announcement. Prepare and save these forms to your desktop (e.g., project narrative, resume file, budget file, …). Once finalized and files are named as indicated in Part IV of the Announcement, upload (attach) these files individually within the Adobe Application Package by clicking on "Add Mandatory Other Attachment" to attach the Project Narrative and clicking on "Add Optional Other Attachment" to attach the remaining files.

4) Once all completed files have been attached within the Adobe Application Package, save the Adobe Application Package to your desktop, and submit to FedConnect, following the steps outlined in the FedConnect Quick Start Guide at: https://www.fedconnect.net/Fedconnect/PublicPages/FedConnect_Ready_Set_Go.pdf.

Note that it is the responsibility of the applicant, prior to the Application due date and time, to verify successful transmission in FedConnect.

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PART I – FUNDING OPPORTUNITY DESCRIPTION

INTRODUCTION:

AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009[1]

Projects under this Funding Opportunity Announcement (FOA) will be funded, in whole or in part, with funds appropriated by the American Recovery and Reinvestment Act of 2009, Pub. L. 111-5, (Recovery Act or Act). The Recovery Act's purposes are to stimulate the economy and to create and retain jobs. The Act gives preference to activities that can be started and completed expeditiously, including a goal of using at least 50 percent of the funds made available by it for activities that can be initiated not later than June 17, 2009. Due to the schedule of this FOA, this date does not impact applications to this FOA. Accordingly, special consideration will be given to projects that promote and enhance the objectives of the Act, especially job creation, preservation and economic recovery, in an expeditious manner.

Be advised that special terms and conditions may apply to projects funded by the Act relating to:

- Reporting, tracking and segregation of incurred costs;
- Reporting on job creation and preservation;
- Publication of information on the Internet;
- Access to records by Inspectors General and the Government Accountability Office;
- Prohibition on use of funds for gambling establishments, aquariums, zoos, golf courses or swimming pools;
- Ensuring that iron, steel and manufactured goods are produced in the United States;
- Ensuring wage rates are comparable to those prevailing on projects of a similar character;
- Protecting whistleblowers and requiring prompt referral of evidence of a false claim to an appropriate inspector general; and
- Certification and Registration.

These special terms and conditions will be based on provisions included in Titles XV and XVI of the Act. The exact terms and conditions will be provided when available.

The Office of Management and Budget (OMB) has issued Initial Implementing Guidance for the Recovery Act. See M-09-10, Initial Implementing Guidance for the American Recovery and Reinvestment Act of 2009. OMB will be issuing additional guidance concerning the Act in the near future. Applicants should consult the DOE website, www.energy.gov, the OMB website http://www.whitehouse.gov/omb/, and the Recovery website, www.recovery.gov regularly to keep abreast of guidance and information as it evolves.

Recipients of funding appropriated by the Act shall comply with requirements of applicable Federal, State, and local laws, regulations, DOE policy and guidance, and instructions in this FOA, unless relief has been granted by DOE. Recipients shall flow down the requirements of applicable Federal, State and local laws, regulations DOE policy and guidance, and instructions in this FOA to subrecipients at any tier to the extent necessary to ensure the recipient's

[1] American Reinvestment and Recovery Act of 2009
http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111_cong_bills&docid=f:h1enr.txt.pdf

compliance with the requirements.

Be advised that Recovery Act funds can be used in conjunction with other funding as necessary to complete projects, but tracking and reporting must be separate to meet the reporting requirements of the Recovery Act and related OMB Guidance. Applicants for projects funded by sources other than the Recovery Act should plan to keep separate records for Recovery Act funds and to ensure those records comply with the requirements of the Act. Funding provided through the Recovery Act that is supplemental to an existing grant is one-time funding.

Applicants should begin planning activities for their first tier subawardees, including obtaining a DUNS number (or updating the existing DUNS record), and registering with the Central Contractor Registration (CCR). The extent to which subawardees will be required to register in CCR will be determined by OMB at a later date.

BACKGROUND:
The Department of Energy (DOE), Office of Energy Efficiency and Renewable Energy (EERE), announces a notice of availability of funding for financial assistance from the Office of the Biomass Program. DOE has funded biorefinery technology development projects since FY 2002 to meet two of the EERE performance goals: 1) dramatically reduce, or even end, dependence on imported oil; and 2) spur the creation of the domestic bioindustry.

Due to the passage of the Recovery Act, this FOA replaces and expands upon the DE-PS36-09GO99038 FOA. Changes have been made to the available Topic Areas, funding profile, and schedule.

DESCRIPTION:
The intent of this FOA will be to select integrated biorefinery[2] projects that have the necessary technical and economic performance data that validates their readiness for the next level of scale-up. In general, "integrated biorefineries" employ various combinations of feedstocks and conversion technologies to produce a variety of products, with the main focus on producing biofuels and bioproducts. Co- or by-products can include additional fuels, chemicals (or other materials), and heat and power. For the purpose of this FOA, the term "integrated biorefinery" is a facility that uses an **"acceptable feedstock"** (as defined in Appendix A), to produce a biofuel or bioproduct as the **"primary product"** (as defined in Appendix A) and may produce other products including additional fuels, chemicals (or other materials), and heat and power as co-products. These integrated biorefineries would produce, as their primary product, a liquid transportation fuel that supports, depending on topic area, meeting the advanced, renewable or advanced biofuels portion of the Energy Independence and Security Act of 2007 (EISA) Renewable Fuel Standards (RFS) or, depending on topic area, a bioproduct that substitutes for petroleum-based feedstocks and products.

DOE encourages applications that propose novel or breakthrough technologies and those that

[2] Integrated biorefineries are discussed further in the following reference http://www1.eere.energy.gov/biomass/integrated_biorefineries.html, and the components of such integrated systems are the basis for Section 932 (an excerpt of the language of Section 932 is found in Appendix B of this FOA).

include appropriate collaboration between and among industry, academia, and DOE National Laboratories, FFRDCs (Federally Funded Research and Development Centers) or other government-funded facilities.

This FOA has six topic areas described below. Each topic area is related to beneficial use of renewable biomass for the production of liquid transportation biofuel(s) and bioproduct(s) that is/are a replacement for fossil derived liquid transportation fuels and petroleum-based chemicals. Biobased chemicals and substitutes for petroleum-based feedstocks and products may be included as part of the integrated biorefinery process, provided that the applicant demonstrates that it has credible economics to prove the viability of the proposed biorefinery. An acceptable biofuel or bioproduct must be the primary product of the project proposed in the application.

Applicants should note that the technology for producing heat and power by conventional means (e.g. stoker or fluidized bed boilers, co-firing with coal, etc.) is an established technology, and this FOA is designed to address the high technical risks associated primarily with converting biobased feedstocks to biofuels and bioproducts rather than to heat and power. Hence, for this FOA, applications that propose biorefineries producing heat and power as the primary product would be considered non-responsive. Applicants may, however, propose projects producing heat and power resulting from a biorefinery if the production of an acceptable liquid transportation biofuel or bioproduct is the "primary product."

Each applicant may submit only one application to one, and only one, topic area (1 through 6) of this FOA. Each application must propose one, and only one, integrated biorefinery. **Applicants must identify the topic area to which they are applying in the Project Narrative Cover Sheet.** It is not the intent of this FOA to fund projects through pilot scale and into demonstration.

This FOA contains six topic areas (1, 2, 3, 4, 5, 6) with the purposes of promoting flexibility for the applicants, encouraging competition, allowing for reasonable levels of scale up, and in recognition that the diverse technologies likely to be submitted may require different volumes to be technically feasible.

TOPIC AREA DESCRIPTIONS

Topic Area 1

Topic Area 1 requests applicants to design, construct, and operate an integrated **pilot-scale** biorefinery in order to validate the technology. The proposed pilot-scale biorefinery must utilize an Acceptable Feedstock to produce an Acceptable **Biofuel** as defined below for this Topic Area.

For the purpose of this FOA, a pilot-scale biorefinery project is defined as a facility with a throughput of no less than one (1) dry tonne of feedstock per day.

Topic Area 2

Topic Area 2 requests applicants to design, construct, and operate an integrated **pilot-scale** biorefinery in order to validate the technology. The proposed pilot-scale biorefinery must utilize an Acceptable Feedstock to produce an Acceptable **Bioproduct** as defined below for this Topic

Area.

For the purpose of this FOA, a pilot-scale biorefinery project is defined as a facility with a throughput of no less than one (1) dry tonne of feedstock per day.

Topic Area 3
Topic Area 3 requests that applicants design, construct and operate an integrated **demonstration-scale** biorefinery to validate the technology. The proposed demonstration-scale biorefinery must utilize an Acceptable Feedstock to produce an Acceptable **Biofuel** as defined below for this Topic Area.

The proposed demonstration-scale biorefinery must be designed and constructed for a throughput of at least fifty (50) dry tonnes of feedstock per day.

Topic Area 4
Topic Area 4 requests that applicants design, construct and operate an integrated **demonstration-scale** biorefinery to validate the technology. The proposed demonstration-scale biorefinery must utilize an Acceptable Feedstock to produce an Acceptable **Bioproduct** as defined below for this Topic Area.

The proposed demonstration-scale biorefinery must be designed and constructed for a throughput of at least fifty (50) dry tonnes of feedstock per day.

Topic Area 5
Topic Area 5 requests applicants to design, construct, and operate an integrated **pilot-scale** biorefinery in order to validate the technology. The proposed pilot-scale biorefinery must utilize an Acceptable Feedstock to produce and Acceptable **Biofuel** as defined below for this Topic Area.

For the purpose of this FOA, a pilot-scale biorefinery project is defined as a facility with a throughput of no less than one (1) dry tonne of feedstock per day.

Topic Area 6
Topic Area 6 requests that applicants design, construct and operate an integrated **demonstration-scale** biorefinery to validate the technology. The proposed demonstration-scale biorefinery must utilize an Acceptable Feedstock to produce an Acceptable **Biofuel** as defined below for this Topic Area.

The proposed demonstration-scale biorefinery must be designed and constructed for a throughput of at least fifty (50) dry tonnes of feedstock per day.

Requirements and Limitations for all Topic Areas
The proposed biorefinery project must be located within the United States and use a feedstock from a domestic source. The focus of this FOA is to validate the performance of the proposed technology, obtain operational information, validate key process metrics, and/or provide continuous operational data at the scale needed to lower the technical risks associated with

proceeding to the next development step, ultimately culminating in development of a viable commercial plant. Therefore, in lieu of constructing a new facility, the applicant may propose the use of an existing pilot-scale or demonstration-scale biorefinery as appropriate to the Topic Area. Applicants may propose constructing new facilities or modifications to an existing facility (including adding equipment or modules) where it is economically and technically advantageous to do so.

To support DOE's goals, it is expected that the projects proposed under this FOA will be operational as soon as possible after award. For pilot-scale projects (Topic Areas 1, 2 and 5), biorefinery technologies and systems are sought that have the capability to proceed rapidly through piloting and on to demonstration. For demonstration-scale projects (Topic Areas 3, 4, and 6), biorefinery technologies and systems are sought that can proceed rapidly to commercial scale operation following successful completion of the proposed project. It is expected that the successfully completed projects under this FOA ultimately will lead to commercialization after further development. Only those applicants that are willing and able to diligently pursue taking the integrated technology to commercial scale and have a sound business and technology strategy to deploy and/or license and market the technology commercially should apply.

Although it may only be conceptual in nature, applicants must provide preliminary design and economic projections for an envisioned first commercial biorefinery using the technology validated as a result of the proposed project. The applicant must provide both the technical and financial forecast data on the forms referenced in Part IV.C. The forecast data will be evaluated by the Merit Review Committee, but the emphasis for scoring purposes will be on the reasonableness and thoroughness of the discussion of the planning, methodology, and assumptions that support the data. Applicants to the demonstration-scale Topic Areas (3, 4, and 6) are expected to have more concrete and well-developed commercialization strategies.

The applicant must demonstrate successful completion of sufficient prior work to justify the basis for using the proposed technology and the scale-up factors for the proposed project scale. That is, applicants to a pilot-scale Topic Area (1, 2, or 5) must have completed bench- or pilot-scale data using the proposed feedstock. Pilot-scale data could, for example, be from a non-integrated pilot plant or from selected unit operations from an integrated facility.

Similarly, if applying to a demonstration scale Topic Area (3, 4, or 6) the applicant must have sufficient integrated pilot-scale data, or non-integrated demonstration-scale data using the proposed feedstock. The collected data must justify the basis for the selection of the technology and the scale-up factor for the proposed demonstration-scale integrated biorefinery. For example, demonstration-scale data could be from a non-integrated demonstration facility or from selected unit operations from an integrated facility. The applicant must demonstrate having successfully completed sufficient work at least at the pilot scale for any substantially new process included in the application in order to be considered for this topic area. A "new process" is any major functional step in a process that incorporates technology not previously used by this industry.

A limited amount of preparatory work to support the design of the proposed pilot-scale project will be allowed within the scope of the project. Typically up to 10% of the total project budget

(total allowable budget) may be proposed for the preparatory R&D, but the amount is subject to negotiation after notification of selection for negotiation of an award. Preparatory work may include limited research and development (R&D) including expenses for equipment, salaries, and supplies. Appendices C, D and E provide more information on the scope that would be permissible as preparatory work.

Acceptable Feedstocks for All Topic Areas

Acceptable feedstocks must be domestically available and compliant with the definitions provided in this section. The acceptable feedstocks proposed in response to this FOA must be shown to be domestically available in sufficient quantities to contribute meaningfully to the RFS goal of 21 billion gallons of advanced biofuels by 2022.

Using the definitions of "renewable biomass" as stated in the Energy Policy Act of 2005 (EPAct 2005), the Energy Independence and Security Act of 2007 (EISA 2007), and the Food, Conservation, and Energy Act of 2008, Title IX, Sec. 9001, as guidance, for the purpose of this FOA, the acceptable feedstocks will be those listed below:

(A) materials, pre-commercial thinnings, or invasive species from National Forest System land and public lands (as defined in section 103 of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1702)) that –
  (i) are byproducts of preventive treatments that are removed –
    (I) to reduce hazardous fuels;
    (II) to reduce or contain disease or insect infestation; or
    (III) to restore ecosystem health;
  (ii) would not otherwise be used for higher-value products; and
  (iii) are harvested in accordance with –
    (I) applicable law and land management plans; and
    (II) the requirements for
      i. old-growth maintenance, restoration, and management direction of paragraphs (2), (3), and (4) of subsection (e) of section 102 of the Healthy Forests Restoration Act of 2003 (16 U.S.C. 6512); and
      ii. large-tree retention of subsection (f) of that section; or

(B) organic matter that is available on a renewable or recurring basis from non-Federal land or land belonging to an Indian or Indian tribe that is held in trust by the United States or subject to a restriction against alienation imposed by the United States, including –
  (i) renewable plant material, including –
    (I) organic material grown for the purposes of being converted to energy; and
    (II) algae; and
  (ii) waste material, including –
    (I) crop residue (including cobs, stover, bagasse and other residues);
    (II) other vegetative waste material (including wood waste and wood residues);
    (III) food waste and yard waste.

No plant based material that is generally intended for use as food can be employed as a feedstock

except as noted below under **"**Additional Feedstocks Acceptable For Topic Areas 5 and 6." Hence, sugars derived from sugarcane or beets and oils derived from soy, canola, sunflower, peanut, etc. normally recovered using conventional food processing methods will be excluded from eligibility for this FOA. The determining factor will be the typical use of the material in commerce. Use of excess oil production of food-grade oil also does not constitute an acceptable feedstock. Distillers Dried Grains with Soluble (DDGS) is also excluded. Additional information regarding the use of algae as a feedstock is included in Appendix J.

Municipal Solid Waste (MSW) is not an acceptable feedstock. However, biomass as defined in EPAct 2005 (Public Law 109-58) Section 932(a)(1-2) that is segregated from the MSW as a separate stream, could be employed as a feedstock with appropriate considerations for the costs of such segregation, collection, processing, and transportation. Hence, post-sorted MSW, where all recyclables and non-biomass components have been removed, would qualify, but only the remaining dry material that meets the above requirements would qualify as a feedstock for purposes of this FOA. Allowable costs include processing (such as, chipping or grinding) the feedstock into a form that can be fed into the reactor. Processing costs for MSW are restricted to post-sorted materials.

Feedstock Requirements for Applications to Topic Areas 1 and 3

The applicant must propose the use of at least one high impact feedstock as defined in Appendix A.

Additional Feedstocks Acceptable For Topic Areas 5 and 6

Under the authority provided by EISA 2007, Section 207, applicants may propose to utilize any feedstock that satisfies the definitions in EISA 2007 Section 201 (1)(B) "Advanced Biofuel." Consistent with this authority, applicants to Topic Areas 5 or 6 must present a credible life-cycle analysis of their proposed biofuel (the "primary product") to meet the provisions in EISA 2007 Section 207 (b) to achieve "at least an 80 percent reduction in lifecycle greenhouse gas emissions when compared to the comparable motor vehicle fuel lifecycle emissions during calendar year 2005."

Regardless of the feedstock proposed under Topic Area 5 or 6, applicants must propose the use of at least one domestically available, high impact (as defined in Appendix A), lignocellulosic or algae feedstock in their "Business and Commercialization Plan," for use in their envisioned first commercial-scale biorefinery.

Acceptable Biofuels for Topic Areas 1 and 3

Using the definitions of "advanced biofuel" as stated in EPAct 2005, EISA 2007, and the Food, Conservation, and Energy Act of 2008, Title IX, Sec. 9001, as guidance, for the purpose of the FOA, the acceptable biofuels will be those listed below:

(A) Advanced Biofuel –

(i) In General – The term 'advanced biofuel' means renewable fuel, other than ethanol derived from corn starch, that has lifecycle greenhouse gas emissions, as determined by the Administrator of the Environmental Protection Agency (EPA), after notice and opportunity for comment, that are at least 50 percent less than baseline lifecycle greenhouse gas emissions. At the time of the

posting of this FOA, the EPA Administrator has not made this determination. Therefore, to address this, the applicant must present an analysis demonstrating to what extent the proposed advanced biofuel will reduce greenhouse gas emissions.

(ii) A renewable biofuel is a liquid transportation fuel that is produced from renewable biomass (see "Acceptable Feedstocks" herein) and that is used to replace or reduce the quantity of fossil fuel present in a transportation fuel.

(iii) Inclusions – Subject to the other provisions in this FOA, the types of fuels eligible for consideration as 'advanced biofuel' may include any of the following so long as they are derived from an acceptable feedstock:

(I) Ethanol
(II) Butanol or other alcohols
(III) Green gasoline and diesel (produced via Fischer-Tropsch synthesis, pyrolysis or other means)
(IV) Other novel fuels derived from lignocellulosic biomass or algae.

"Biodiesel" or other diesel-equivalent fuel derived from renewable biomass, including vegetable oil and animal fat, is specifically excluded, unless derived from a non-food feedstock.

Applicants should note that the technology for producing biodiesel by conventional means is considered an established technology. The intent of this FOA is not to optimize existing commercial technologies. Hence, for this FOA, applications that propose biorefineries producing biodiesel from non-algal oils via transesterification or other established technologies would likely be rated lower than applications proposing unique or highly innovative technologies. In addition, research into improvements in biomass-derived syngas conversion to Fischer-Tropsch products, methanol, and ammonia, iso and oxosynthesis to aldehydes/alcohols would be scored lower due to the extensive historical industrial and government investment in these conversion technologies.

Acceptable Biofuels for Topic Areas 5 and 6

Under the authority provided by EISA 2007, Section 207, applicants may propose to produce any liquid transportation fuel as the "primary product," that satisfies the definitions in EISA 2007 Section 201 (1)(B) "Advanced Biofuel." Consistent with this authority, applicants to Topic Area 5 or 6 must present a credible life-cycle analysis of their proposed biofuel (the "primary product") to meet the provisions in EISA 2007 Section 207 (b) to achieve "at least an 80 percent reduction in lifecycle greenhouse gas emissions when compared to the comparable motor vehicle fuel lifecycle emissions during calendar year 2005."

Regardless of the feedstock proposed under Topic Area 5 or 6, applicants must propose the use of at least one domestically available, high impact (as defined in Appendix A), lignocellulosic or algae feedstock in their "Business and Commercialization Plan," for use in their envisioned first commercial-scale biorefinery.

Additional Requirements For Biofuels That Are Not Currently Widely Accepted And Available (Applies To All Biofuel Topic Areas (1, 3, 5, 6))

An acceptable biofuel proposed as the primary product by an applicant must be a currently

accepted and widely available biofuel (such as ethanol). Alternatively, applicants are encouraged to propose new biofuels. For fuels that are not currently widely accepted and available, the application must show that, if the proposed project achieves its economic and technical success factors, the proposed biofuel could be successfully commercialized in the timeframe and in the volumes that would reasonably be expected to significantly contribute to the goal of 21 billion gallons of advanced biofuels by 2022. Applications proposing fuels that are not currently widely accepted and available must describe a clear path to achieving the status of an acceptable liquid transportation biofuel, including but not limited to the following:

- obtaining vehicle manufacturer(s) approval;
- obtaining EPA fuel registration(s);
- establishing standards for use, production, storage, transportation, and retail dispensing; and,
- establishing the distribution/dispensing infrastructure.

An estimate of the costs and a discussion of the activities required for eventually commercializing the proposed biofuel must be described in the application; however, commercialization and market research are not allowable costs.

Acceptable Bioproducts (Applies to Topic Areas 2 and 4)

Using the definitions in EPAct 2005 (Public Law 109-58) Section 932(c)(4) and (d)(1)(B)(ii-iii), applications to Topic Areas 2 and 4 may propose to produce high-value biobased chemicals or substitutes for petroleum-based feedstocks and products that are cost-effective when compared to the petroleum based equivalent. Applications proposing to make a biobased chemical using an acceptable feedstock must also provide a petroleum displacement analysis using the format provided in Appendix I. Applications will not be scored on the amount of petroleum displaced but rather on the reasonableness and thoroughness of the discussion.

Summary of Topic Areas and Authorities

Topic Area	Scale	Acceptable Feedstock examples	Primary Product	Legislative Authority	Greenhouse Gas Reduction Requirements
1	Pilot	Algae, Lignocellulosic Biomass	Biofuel	EPAct 2005, Section 932	No minimum, must provide analysis
2	Pilot	Algae, Lignocellulosic Biomass	Bio-product	EPAct 2005, Section 932	No minimum, must provide analysis
3	Demonstration	Algae, Lignocellulosic Biomass	Biofuel	EPAct 2005, Section 932	No minimum, must provide analysis
4	Demonstration	Algae, Lignocellulosic Biomass	Bio-product	EPAct 2005, Section 932	No minimum, must provide analysis

5	Pilot	Any renewable biomass except corn starch	Biofuel	EISA 2007, Section 207	Minimum 80% reduction over comparable motor vehicle fuel
6	Demonstration	Any renewable biomass except corn starch	Biofuel	EISA 2007, Section 207	Minimum 80% reduction over comparable motor vehicle fuel

LEGISLATIVE AUTHORITY:

This FOA is being issued under authorization of the Energy Policy Act of 2005 (EPAct 2005), Section 932 and the Energy Independence and Security Act of 2007 (EISA), Section 207 (See Appendix B). Amendments to the Internal Revenue Code of 1986 within Title XIII, Energy Policy Tax Incentives cited in EPAct 2005 and Sections 1345 and 1346 (renewable fuel and biodiesel credits) of EPAct 2005 may provide additional impetus and credit enhancements for potential applicants to respond to this announcement. The EISA Renewable Fuel Standard (RFS) includes provisions that support the continued development and use of biofuels including a volume of 36 billion gallons of "renewable" fuel by the end of 2022. The acceptable feedstocks in this FOA are expected to contribute to the goals for "advanced, renewable and lignocellulosic biofuels" by 2022.

PART II – AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT

DOE anticipates awarding cooperative agreements for Topic Areas 1, 2, and 5 and either cooperative agreements or Technology Investment Agreements (TIAs) for Topic Areas 3, 4, and 6 for projects resulting from this FOA.

Phases of Cooperative Agreements and TIAs. Each project will be divided into three budget periods or use three separate, sequential awards. DOE's determinations for proceeding from one award/budget period to the next will be based on go/no go decision criteria that will be negotiated with the applicants. If a TIA is used, it will be structured in phases that are very similar to cooperative agreements, and it will also contain similar go/no go decision points between the major phases of these awards. Additional information on the award/budget periods is in Part II.F and Appendix G, Typical Award Structure.

Technology Investment Agreements. TIAs are an assistance instrument that can be used to support or stimulate research projects involving for-profit firms, especially commercial firms that do business primarily in the commercial marketplace. TIAs are different from grants and cooperative agreements in that the award terms may vary from the Government-wide standard terms. TIAs can provide flexibility in such areas as intellectual property rights, accounting standards and payment provisions (See DOE TIA regulations at 10 CFR Part

603). However, even with the use of a TIA, certain government requirements will continue to apply, such as accounting audit provisions and applicable cost principles. The primary purposes for including TIAs in the type of available award instruments are to encourage non-traditional government contractors to participate in Research, Development and Demonstration (RD&D) programs and to facilitate new relationships and business practices.

An applicant may request a TIA if it believes that using a TIA could benefit the RD&D objectives of the program (see section 603.225) and can document these benefits. After an applicant is selected for negotiation of an award, the Contracting Officer will determine if awarding a TIA would benefit the RD&D objectives of the program in ways that likely would not happen if another type of assistance instrument were used (e.g., cooperative agreement subject to the requirements of 10 CFR part 600). The Contracting Officer will use the criteria in 10 CFR 603, Subpart B to make this determination.

Other Requirements for a TIA. In accordance with 10 CFR 603.215, to the maximum extent practicable, non-Federal parties carrying out a RD&D project under a TIA are to provide at least 50% cost share, even though the statutory cost share requirement may be less. The Contracting Officer will consider the amount of cost share proposed as part of the determination of whether a TIA is the appropriate instrument for a particular project.

B. ESTIMATED FUNDING

- Approximately $480,000,000 is expected to be available for new awards through FY2010. All funds will be obligated to the projects no later than September 30, 2010 and must be spent by the project no later than September 30, 2015.

C. MAXIMUM AND MINIMUM AWARD SIZE

- Ceiling for Topic Areas 1, 2, and 5 (i.e., the maximum amount for an individual award made under this announcement): $25,000,000 in DOE cost share
- Ceiling for Topic Areas 3, 4 and 6 (i.e., the maximum amount for an individual award made under this announcement): $50,000,000 in DOE cost share
- Floor (i.e., the minimum amount for an individual award made under this announcement): none

D. EXPECTED NUMBER OF AWARDS

DOE anticipates making approximately 10-20 awards under this announcement, depending on the Topic Area and size of awards. DOE may choose to fund projects out of all, some, one, or none of the Topic Areas, based on the merit of the applications.

E. ANTICIPATED AWARD SIZE

While the maximum award size (i.e., the ceiling for the DOE share) for Topic Areas 1, 2, and 5 is $25,000,000 and $50,000,000, for Topic Areas 3, 4, and 6, DOE anticipates that awards will be in the $15,000,000-25,000,000 range for Topic Areas 1, 2, and 5 and $40,000,000-50,000,000 for Topic Areas 3, 4, and 6.

F. PERIOD OF PERFORMANCE

As discussed above in Part II.A, each project is expected to have three budget periods or use

three separate, sequential awards. Each award/budget period following the first shall be contingent upon satisfactory (including timely) performance of the preceding award(s)/budget period(s) as determined by DOE's assessment of go/no go criteria negotiated for each award. Additional information on the award structure is provided in Appendix G. All funds will be obligated to the projects no later than September 30, 2010 and must be spent by the project no later than September 30, 2015.

Award/budget period 1 will be for the completion of activities such as preliminary design; completing National Environmental Policy Act (NEPA) documentation; permitting; limited preparatory R&D; development of a detailed Risk Mitigation Plan (RMP); and, similar preparatory activities. Due to the purpose and goals of this FOA, the applicants should plan to obtain the award and complete the first award/budget period as rapidly as possible. If the NEPA determination requires an Environmental Impact Statement, the period for award/budget period 1 would be extended until after the Record of Decision is final.

Award/budget period 2 will follow the successful completion of award/budget period 1. The transition from award/budget 1 to award/budget period 2 is contingent upon DOE's decision on go/no go criteria, specifically including completion of NEPA documentation and DOE's decision to proceed with funding. Typical activities during this period include new construction or construction for modification to an existing facility, and it will end after completion of a negotiated cumulative run time (typically a few months) after shakedown and the completion of the construction as evidenced by DOE's acceptance of an Independent Engineer's performance test report.

Award/budget period 3 will last for up to approximately 5 years after the successful completion of award/budget period 2 as determined by DOE and is subject to negotiations after selection. The applicant's primary activity in award/budget period 3 with regard to the DOE project will be the production of comprehensive technical, operating and financial reports acceptable to DOE. The duration of award/budget period 3 will be based on the schedule presented in the application for the period of operations and testing proposed by the applicant, funding availability, and other factors. (See also Subpart II.F, "Period of Performance" and Appendix G for a further discussion of the project phases.)

In order to meet the intent and address the goals of this FOA, DOE considers time to be of the essence in the efficient and timely prosecution of the awards resulting from the FOA. To affect this, selectees must diligently pursue and complete the required negotiation process with the Golden Field Office in order to execute an award no later than September 30, 2010. The selectees are responsible for submitting the required information in a timely manner to ensure that the award will not be encumbered with significant conditions. That is, only minimal additional effort and time will be allowed for the award scope to be initiated and executed, and for construction (including modification of existing facilities if such are used) to begin in earnest. Examples of unacceptable delays for making an award include but are not limited to: (1) failure to grow or purchase adequate quantities of feedstock, (2) failure to secure intellectual property rights necessary to implement the proposed approach, (3) failure to provide sufficient information for DOE to issue a NEPA determination, (4) changing the proposed sites or discovering significant site issues which impact the project schedule, and

(5) failure to secure sufficient funding, including contingency and management reserve, for the project.

In the event the applicant cannot or does not obtain the initial award and each subsequent award/budget period and diligently pursue completion of the project, DOE may at its sole discretion 1) cease negotiations for award, or 2) not renew or extend an award/budget period.

Specifically, DOE will take actions necessary to meet the statutory and program policy goals. To affect this, DOE will work with the selectees/awardees as is reasonable and prudent regarding the project schedule, scope, budget and modifications. However, in the event it becomes clear to DOE that the project is not progressing reasonably to achieve its successful and timely completion, DOE may elect to not renew or extend an award/budget period for a poorly performing or non-performing project.

Decommissioning or mothballing costs are not allowable or allocable costs under awards from this FOA. Therefore, although a disposition plan including a cost estimate and the source of the resources for conducting the effort must be included with the application, no budget for planning or taking any action to mothball or decommission the facility may be included in the Total Allowable Cost for either the DOE or Recipient cost share.

The Recipient is solely and wholly responsible for maintaining the facility in a safe, stable and compliant manner during and (as applicable) after the award period.

G. TYPE OF APPLICATION

Only new applications will be accepted under this announcement (that is, applications for renewals or extensions of existing DOE funded projects will not be considered).

Prior DOE award recipients may apply, however, the scope must be clearly distinct from previously received application(s) and any awards resulting from them. That is, the funds from a project resulting from this FOA (including both DOE and cost share funds) cannot be used to pay for scope that is already described in the earlier application or award for any reason including underestimating or overspending due to any cause or combination of causes. The application should be prepared as a new application as the reviewers will not have access to the previously submitted application or to information concerning the existing R&D, pilot-scale results, or other efforts.

Previously selected projects that propose new projects based on increasing throughput of the already selected process or a substantially similar process will not be considered, nor will incremental improvements or changes to either processes proposed in the other applications or in the awards resulting from the applications. For example, adding modules or circuits that are substantially similar to those already planned or in place would clearly not be acceptable for consideration regardless of whether similar or different feedstocks are used.

H. GENERAL INFORMATION

Awards under this FOA will be funded, in whole or in part, with funds appropriated by the American Recovery and Reinvestment Act of 2009, Pub. L. 111-5, (Recovery Act or Act).

Be advised that special terms and conditions may apply to projects funded by the Act relating to:

- Reporting, tracking and segregation of incurred costs;
- Reporting on job creation and preservation;
- Publication of information on the Internet;
- Access to records by Inspectors General and the Government Accountability Office;
- Prohibition on use of funds for gambling establishments, aquariums, zoos, golf courses or swimming pools;
- Ensuring that iron, steel and manufactured goods are produced in the United States;
- Ensuring wage rates are comparable to those prevailing on projects of a similar character;
- Protecting whistleblowers and requiring prompt referral of evidence of a false claim to an appropriate inspector general; and
- Certification and Registration.

These special terms and conditions will be based on provisions included in Titles XV and XVI of the Act. These Special Provisions are located at: http://management.energy.gov/business_doe/business_forms.htm.

PART III - ELIGIBILITY INFORMATION

A. ELIGIBLE APPLICANTS.

The following entities are eligible to apply for this announcement: 1) Institutions of higher education; 2) Nonprofit and for-profit private entities; 3) State and local governments; 4) Indian Tribes; 5) Tribal Energy Resource Development Organizations or Groups and 6) Consortia of entities 1 through 5.

B. COST SHARE

- For pilot-scale projects (Topic Areas 1, 2, and 5) the applicant must provide a minimum cost share of 20% of the total project budget and recipient cost share funds must come from non-Federal sources unless otherwise allowed by law. However, applications with proposed cost share as low as 10% applicant share shall be considered, using the Secretary's statutory authority to reduce cost-share requirements. **Applicants proposing cost-share below 20% (applicant-share) shall provide a justification for their request in the Project Narrative Part IV.C.b.** For Indian Tribes or Tribal Energy Resources Groups, cost share may be waived in full. Please note that cost share is an evaluated criterion in accordance with Part V.A.3 of the FOA.
- For demonstration-scale projects (Topic Areas 3, 4, and 6), the applicant must provide a minimum cost share of 50% of the total project budget and recipient cost share funds must come from non-Federal sources unless otherwise allowed by law. However, applications with proposed cost share as low as 25% applicant share shall be considered, using the Secretary's statutory authority to reduce cost-share requirements. For academic institutions, non-profit organizations, Indian Tribes or Tribal Energy Resource Development Groups, and state and local governments, the non-Federal cost share for

demonstration and commercial application activities must be at least 10% of total allowable costs. **Applicants proposing cost-share below 50% (applicant-share) shall provide a justification for their request in the Project Narrative Part IV.C.b.** Please note that cost share is an evaluated criterion in accordance with Part V.A.3 of the FOA.

Total project budget (also known as the "total project cost" or "total allowable cost") is the sum of the DOE and the applicant's cost share funds. Costs incurred prior to selection for negotiation of award under the FOA will not be reimbursable or allowed as cost share.

Refer to Appendix C for further discussion of calculating cost share and Appendix A for additional information on the definition of "recipient," "Indian Tribe," and "Tribal Energy Resource Development Groups."

C. OTHER ELIGIBILITY REQUIREMENTS

- Applicants for this FOA must disclose any current, threatened, or pending litigation involving the applicant related to permitting, public involvement, environmental irregularities, construction defects, securities fraud, conflict of interest, failure to perform under a state or federal contract, or other charges which may reflect on the applicant's financial position or ability to complete the project.
- An applicant to this FOA must certify that it has all necessary intellectual property rights, as set forth in Subpart IV.C.o.
- **Federally Funded Research and Development Center (FFRDC) Contractors.** FFRDC contractors are not eligible for an award under this announcement, but they may be proposed as a team member on another entity's application subject to the following guidelines:

Authorization for non-DOE FFRDCs. The Federal agency sponsoring the FFRDC contractor must authorize, in writing, the use of the FFRDC contractor on the proposed project and this authorization must be submitted with the application. The use of a FFRDC contractor must be consistent with the contractor's authority under its award. Save the authorization in a single file named "FFRDC_Auth.pdf," and click on "Add Optional Other Attachment" to attach.

Authorization for DOE FFRDCs. The cognizant contracting officer for the FFRDC must authorize in writing the use of a DOE FFRDC contractor on the proposed project and this authorization must be submitted with the application. The following wording is acceptable for this authorization.

> "Authorization is granted for the _____ Laboratory to participate in the proposed project. The work proposed for the laboratory is consistent with or complementary to the missions of the laboratory, will not adversely impact execution of the DOE assigned programs at the laboratory."

Value/Funding. The value of, and funding for, the FFRDC contractor portion of the work will not normally be included in the award to a successful applicant. Usually, DOE will fund

a DOE FFRDC contractor through the DOE field work proposal system and other FFRDC contractors through an interagency agreement with the sponsoring agency.

Cost Share. The Applicant's cost share requirement will be based on the total project cost including the Applicant's and the FFRDC contractor's portions of the effort, if any. FFRDC private contractor, academic, industry, or other non-federal sources may be utilized for cost share as appropriate.

Participation of DOE National Laboratories, Federally Funded Research and Development Centers (FFRDC) Contractors or other government agencies.

The information in this section applies to all DOE National Laboratories, FFRDCs or other government agencies if they are included as a participant in an application. In particular, this section supplements the standard requirements for FFRDCs included in EERE's FOAs in the event FFRDC facilities, such as existing pilot plants, are proposed for use by an applicant. As such, in the event of a conflict, the language in this section is not meant to supersede laws or contracts.

These entities will be eligible to participate, but will not be eligible to be the prime recipient. If proposed as a participant, in addition to the authorizations required by the FOA, the application must include documentation (similar to what will be required from all proposed participants) that includes a description of the services, resources, and facilities that will be used for the project and a statement by the participant that they will be available to the project in the timeframe called for in the application.

For the pilot-scale topic areas (1, 2, and 5) the DOE National Laboratory, FFRDC or other government agency effort, in aggregate, shall not exceed 50% of the total estimated cost of the project with the exception that if the facility is provided by such an organization, their effort be up to 70% of the total estimated cost of the project.

For demonstration-scale topic areas (3, 4, and 6), the DOE National Laboratory, FFRDC or other government agency effort, in aggregate, shall not exceed 5% of the total estimated cost of the project.

Responsibility. The applicant, if successful, will be the responsible authority regarding the settlement and satisfaction of all contractual and administrative issues, including but not limited to, disputes and claims arising out of any agreement between the applicant and the DOE National Laboratory, FFRDC or other government agency contractor.

D. MULTIPLE PRINCIPAL INVESTIGATORS

The assignment and use of more than one Principal Investigator (PI) in projects awarded under this FOA is not allowed. A single point of contact must be identified as the PI for the purposes of this application and potential award.

PART IV – APPLICATION AND SUBMISSION INFORMATION

A. ADDRESS TO REQUEST APPLICATION PACKAGE

The Adobe Application Package is provided as a separate attachment to this FOA (on FedConnect).

Organizations with system-to-system capabilities with Grants.gov for their submissions may continue to use their systems, and their applications will be accepted in Grants.gov to be considered for award.

B. LETTER OF INTENT AND PRE-APPLICATION

1. Notice of Intent to Apply

APPLICANTS ARE REQUESTED TO SUBMIT A NOTICE OF INTENT TO APPLY TO: IBR_FOA@GO.DOE.GOV NO LATER THAN MAY 29, 2009, 11:59 PM EASTERN TIME.

The requested format will be available in the "Documentation" section of this FOA posting on FedConnect (https://www.fedconnect.net/FedConnect/) and will request information such as Applicant, Project Title, Project Partners, Topic Area, Feedstock(s), Primary Product, Co-Product(s), Throughput, Location, and conversion technology. The Notice of Intent to Apply will aid DOE in the planning of the Merit Review and expedite the review and selection process. Due to the time sensitive nature of Recovery Act funds, applicants are strongly encouraged to submit a Notice of Intent to Apply.

2. Pre-application

A pre-application is not required. However, please see the request under IV.B.1 for submittal of a Notice of Intent to Apply.

C. CONTENT AND FORM OF APPLICATION – SF 424

You must complete the mandatory forms and any applicable optional forms, in accordance with the instructions on the forms and the additional instructions below, as required by this FOA. **Files that are attached to the forms must be in Adobe Portable Document Format (PDF) unless otherwise specified in this announcement**.

Once the forms below have been completed, save the Adobe Application Package in a single file, using up to 10 letters of the Applicant's Organization Name as the file name (e.g., UCLA).

1. SF 424 - Application for Federal Assistance *Required*

Complete this form first to populate data in other forms. Complete all required fields in accordance with the pop-up instructions on the form. The list of certifications and assurances referenced in Field 21 can be found at

http://management.energy.gov/business_doe/business_forms.htm, under Certifications and Assurances.

2. **Project/Performance Site Location(s)** *Required*
   Indicate the primary site where the work will be performed. If a portion of the project will be performed at any other site(s), identify the site location(s) in the blocks provided. **Note that the Project/Performance Site Congressional District is entered in the format of the 2 digit state code followed by a dash and a 3 digit Congressional district code; for example, VA-001**. Save in a file named "PPSL.doc" and attach.

Other Attachments Form

Submit the following files with your application and attach them to the Other Attachments Form. Click on "Add Mandatory Other Attachment" to attach the Project Narrative. Click on "Add Optional Other Attachment," to attach the other files.

a. Project Summary/Abstract File

The project summary/abstract must contain a summary of the proposed activity suitable for dissemination to the public. It must be a self-contained document that identifies the name of the applicant, the project director/principal investigator(s), the project title, the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (i.e., benefits, outcomes), and major participants (for collaborative projects). Applicants are cautioned that this document should not include any proprietary information, trade secrets, or other confidential business, financial or sensitive information, since this summary may be subject to public disclosure under the Freedom of Information Act (FOIA). The project summary must not exceed 1 page when printed using standard 8.5" by 11" paper with 1" margins (top, bottom, left and right) with font not smaller than 11 point. Save this information in a file named "Summary.pdf," and click on "Add Optional Other Attachment" to attach.

b. Project Narrative File - Mandatory Other Attachment

The project narrative must not exceed 15 pages, including Project Narrative Cover Sheet, table of contents, charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right). EVALUATORS WILL REVIEW ONLY THE NUMBER OF PAGES SPECIFIED IN THE PRECEDING SENTENCE. The Project Narrative Cover Sheet will be available in the "Documentation" section of this FOA posting on FedConnect (https://www.fedconnect.net/FedConnect/). The font must not be smaller than 11 point. Do not include any Internet addresses (URLs) that provide information necessary to review the application. See Part VIII.D for instructions on how to mark proprietary application information. Save the information in a single file named "Project.pdf," and click on "Add Mandatory Other Attachment" to attach.

The project narrative must include an overview of the project and the eventual, forecast path to commercialization of the products, technology and processes that are

proposed to be developed under the award. In general this includes:

- Project Objectives.
  This section should provide a clear, concise statement of the specific objectives/aims of the proposed project. Attention should be given to identifying the goals, objectives, critical success factors and the "value proposition" (as defined in Appendix A) for the project, and briefly explaining how each will be achieved.

- Project Description
  The description should include an overview of the activities/tasks to be performed, a schedule for the accomplishment of the activities/tasks, a resource loaded plan including the spend plan associated with the activities/tasks, and the expected dates for the release of outcomes. This plan should identify selected key decision points and go/no-go decision criteria.
  - Forecast Commercial-Scale Integrated Biorefinery Summary
    Carefully distinguished from the project proposed under this FOA, summarize the preliminary design and economic projections for an envisioned first commercial biorefinery using the technology validated as a result of the proposed project. (This should be an overview. The details will be submitted in the Business and Commercialization Plan and supporting documents.)
  - Applicants to Topic Areas 5 and 6 must clearly state the ability of their proposed biofuel (the "primary product") to meet the provisions cited in EISA 2007, Section 207 (b) to achieve at least an 80 percent reduction in lifecycle greenhouse gas emissions when compared to the comparable motor vehicle fuel lifecycle emissions during calendar year 2005.

- American Recovery and Reinvestment Act of 2009, P.L. 111-5 (Recovery Act) Information:
  This section must address how the project will promote and enhance the objectives of the Recovery Act, especially job creation and/or preservation, and economic recovery in an expeditious manner. The response must include quantitative data supporting the number of jobs created and/or preserved, as well as data supporting any other direct economic recovery impacts attributable to the performance and conduct of the project. Applicants must clearly state in the **Project Narrative** that the project can rapidly implement and successfully complete the scope by September 30, 2015, while accelerating job creation and economic benefit. To be compliant, each application shall include schedules describing the applicant's ability to complete the project in a timely manner to ensure that all Recovery Act funds are invoiced by September 30, 2015.

- Justification, if any, for less than the required cost share (see Part III.B)

As stated in Subpart II.G, prior DOE award recipients and previously selected projects may apply, however, the scope must be clearly distinct from previously

received application(s) and any awards resulting from them. Applicants to this FOA that are currently under an award or who are under negotiation for award must provide a detailed discussion in the Project Narrative as to how the scope and budget from the application proposed to this FOA distinctly differs from and will not overlap with any current award(s). The distinct differences should be summarized in a bullet point format and then further discussed in the Project Narrative. Applicants required to submit the information in response to this paragraph are allowed to submit a Project Narrative of up to 20 pages. For all other applicants, the page limit as stated above is 15 pages.

The above listed components of your Project Narrative combined, must be within the Narrative page limit specified above. Documents listed below may be included as clearly marked appendices to your Narrative and will not count towards the Project Narrative page limit. Please note that some of the required documents listed below may have their own page limits to which you must adhere.

c. Resume File

Provide a resume for each key person proposed, including subawardees and consultants if they meet the definition of key person. A key person is any individual who contributes in a substantive, measurable way to the execution of the project. Save all resumes in a single file named "resume.pdf" and click on "Add Optional Other Attachment" to attach. Each resume must not exceed 2 pages when printed on 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right) with font not smaller than 11 point and should include the following information, if applicable:

Education and Training. Undergraduate, graduate and postdoctoral training, provide institution, major/area, degree and year.

Professional Experience: Beginning with the current position list, in chronological order, professional/academic positions with a brief description. Where the experience is directly relevant to the proposed project, the applicant may, but is not required to specifically draw attention to it.

Publications. Provide a list of up to 10 publications most closely related to the proposed project. For each publication, identify the names of all authors (in the same sequence in which they appear in the publication), the article title, book or journal title, volume number, page numbers, year of publication, and website address if available electronically.

Patents, copyrights and software systems developed may be provided in addition to or substituted for publications.

Synergistic Activities. List no more than 5 professional and scholarly activities related to the effort proposed.

Of the key personnel identified in this file, indicate the Principal Investigator (PI).

The resume file does not have a total page limitation.

d. Budget File

SF 424 A Excel, Budget Information – Non-Construction Programs File

You must provide a separate budget for each year of support requested and a cumulative budget for the total project period. Use the SF 424 A Excel, "Budget Information – Non Construction Programs" form on the Applicant and Recipient Page at http://management.energy.gov/business_doe/business_forms.htm. You may request funds under any of the Object Class Categories as long as the item and amount are necessary to perform the proposed work, meet all the criteria for allowability under the applicable Federal cost principles, and are not prohibited by the funding restrictions in this announcement (See PART IV, G). Save the information in a single file named "SF424A.xls," and click on "Add Optional Other Attachment" to attach.

e. Budget Justification File

A Budget Justification for SF 424A must be provided for the costs proposed in each Object Class Category/Cost Classification category (e.g., identify key persons and personnel categories and the estimated costs for each person or category; provide a list of equipment and cost of each item; identify proposed subaward/consultant work and cost of each subaward/consultant; describe purpose of proposed travel, number of travelers and number of travel days; list general categories of supplies and amount for each category; and provide any other information you wish to support your budget). Provide the name of your cognizant/oversight agency, if you have one, and the name and phone number of the individual responsible for negotiating your indirect rates as part of the budget justification. Save the information in a single file named "BudgetJustification.xls", and click on "Add Optional Other Attachment" to attach.

See Appendix H for further discussion of budget justification format.

- American Recovery and Reinvestment Act of 2009, P.L. 111-5 (Recovery Act) Additional Budget Justification Information

  Applications shall provide information which validates that all laborers and mechanics on projects funded directly by or assisted in whole or in part by and through funding appropriated by the Recovery Act are paid wages at rates not less than those prevailing on projects of a character similar in the locality as determined by subchapter IV of Chapter 31 of title 40, United States Code (Davis-Bacon Act). For guidance on how to comply with this provision, see http://www.dol.gov/esa/whd/contracts/dbra.htm.

  To satisfy this requirement, please provide a written affirmation that you will comply with the Davis-Bacon Act, as identified above, along with the signature of the authorized representative of your organization.

f. Letters of Commitment

You must have a letter from each third-party contributing cost share (i.e., a party other than the organization submitting the application) that proposes to provide all or part of the required cost share. **All Letters of Commitment must be attached to the Project Narrative File.** Each letter must state that the third party is committed to providing a specific minimum dollar amount of cost share. In the budget justification, identify the following information for each third party contributing cost share: (1) the name of the organization; (2) the proposed dollar amount to be provided; (3) the amount as a percentage of the total project cost; and (4) the proposed type of cost share – cash, services, or property. Letters of Commitment from parties participating in the project, exclusive of vendors, who will not be contributing cost share, but will be integral to the success of the project must be included as part of this Appendix to the Narrative. Letters of Commitment will not count towards the Project Narrative page limit.

g. Subaward Budget File(s)

You must provide a separate budget (i.e., budget for each budget year and a cumulative budget) for each subawardee that is expected to perform work estimated to be more than $100,000 or 50 percent of the total work effort (which ever is less). Use the SF 424 A, "Budget Information – Non Construction Programs" form. This form can be found on the Applicant and Recipient Page at https://www.eere-pmc.energy.gov/forms.aspx. Save each Subaward budget in a separate file. Use up to 10 letters of the subawardee's name plus "424.xls" as the file name (e.g., ucla424.xls or energyres424.xls). Click on "Add Optional Other Attachment" to attach each file.

A budget justification for the subaward budget is also required. The budget justification must include the same justification information described in paragraph e. above.

h. Budget for Federally Funded Research and Development Center (FFRDC) Contractor File, if applicable

If a FFRDC contractor is to perform a portion of the work, you must provide a DOE Field Work Proposal in accordance with the requirements in DOE Order 412.1 Work Authorization System. This order and the DOE Field Work Proposal form are available at the following link: http://www.management.energy.gov/documents/o4121.pdf. Use up to 10 letters of the FFRDC name (plus .pdf) as the file name (e.g., lanl.pdf or anl.pdf), and click on "Add Optional Other Attachment" to attach.

i. Authorization for non-DOE or DOE FFRDCs

Save the Authorization for non-DOE or DOE FFRDCs, as specified in Part III.C. Other Eligibility Requirements, in a single file named "FFRDC_Auth.pdf" and click on "Add Optional Other Attachment"

j. Environmental Questionnaire

You must complete the Environmental Questionnaire. Guidance on completing it can be found in Appendix E, National Environmental Policy Act Submittal Requirements and Guidance. The "Enviro.doc" document is available in the "Documentation" section of this FOA posting on FedConnect (https://www.fedconnect.net/FedConnect/). The questionnaire attachment must not exceed 15 pages when printed on 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right) with font not smaller than 11 point. Save the questionnaire and the supporting information in a single file named "Enviro.pdf" and click on "Add Attachments" in Field 11 to attach.

k. Project Management Plan (PMP)

This plan should be restricted to the scope, schedule and budget of the project proposed under this FOA. It should be closely coordinated and referenced to the proposed projects' work breakdown structure (WBS) and focus on how the project as described in the Project Execution Plan (PEP) will be managed. (See IV.C.k and IV.C.s) The PMP should include a thorough description of risk management, establishing and implementing a quality assurance and control program for the entire proposed project including design and engineering, R&D, construction, production. Additional requirements and guidance for the contents of and for preparing the Project Management Plan are provided in Appendix D. The PMP must not exceed 35 pages when printed on 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right) with font not smaller than 11 point. Save this plan in a single file named "pmp.pdf" and click on "Add Optional Other Attachments" to attach.

l. Historical, Current, and Planned Technical and Financial Data

The historical, current, and planned technical and financial data shall be provided using the format and following the instructions in the "TechandFinData.xls" document which is available in the "Documentation" section of this FOA posting on FedConnect (https://www.fedconnect.net/FedConnect/). Save this plan in a single file named "TechandFinData.pdf" and click on "Add Optional Other Attachments" to attach.

m. Business and Commercialization Plan

This plan must discuss proceeding from the proposed biorefinery to a forecast commercial facility that utilizes a lignocellulosic or algae feedstock, and must correlate with the pro forma. The document must not exceed 20 pages when printed on 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right) with font not smaller than 11 point. Save this plan in a single file named "BusComPlan.pdf" and click on "Add Optional Other Attachments" to attach.

n. Pro forma

Pro formas for various scenarios shall be provided using the format and following the instructions in the "Proforma.xls" document which is available in the "Documentation" section of this FOA posting on FedConnect (https://www.fedconnect.net/FedConnect/). Save the pro formas in a single file named "ProForma.xls" and click on "Add Optional Other Attachments" to attach.

A pro forma must be completed for the proposed project and the future commercial facility. The template requests information on a Federal fiscal year basis (October 1 – September 30). This will aid the applicant in preparing the SF 424A budget form.

o. Intellectual Property (IP) Statement and Supporting Documentation

Statement Regarding IP Rights: See Subpart VIII.F for additional requirements and information. Provide, by deadlines established by DOE, a description of the applicant's rights to use and commercialize the technology:

- Does the applicant (alone or in combination with the partners named in the proposal) own all the intellectual property necessary to accomplish the tasks? If not, has the applicant secured the necessary license rights?

- If the applicant owns the intellectual property, have the rights been licensed to any other parties? If so, describe in general terms the terms and conditions of the license, including duration and exclusivity. If the intellectual property is licensed from another party, please describe in general the terms and conditions of the license(s), including license duration and exclusivity.

Please note that applicants will be required to re-certify their intellectual property rights prior to the oral presentations and prior to executing all phases of the Award. Failure to adequately demonstrate ownership of these intellectual property rights will result in the application being deemed non-compliant and the application will be excluded from further review.

Applicants are strongly encouraged to secure the necessary IP rights and provide the complete statement with their application. Applicants who are still negotiating the IP rights necessary to complete their project must, at a minimum, provide a statement regarding the status of the negotiations with the application. The final Statement must be provided within 7 calendar days after being invited to participate in an oral presentation. If the Statement is not provided within the 7 days or if the Statement does not meet the criteria in this subpart, the Application will be excluded from further review, and the invitation to attend the oral presentation will be revoked.

Save this information in a single file named "ProjectIP.pdf" and click on "Add Optional Other Attachments" to attach. This file must not exceed five (5) pages when printed on 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right) with font not smaller than 11 point.

p. Process Flow Diagram and Supporting Data

A Process Flow Diagram and Supporting Data form must be provided using the format and following the instructions in the PFD_Data supplemental document. The "PFD_Data.doc" document is available in the "Documentation" section of this FOA posting on FedConnect (https://www.fedconnect.net/FedConnect/). Save the Process Flow Diagram and Supporting Data in a single file named "PFD_Data.pdf" and click

on “Add Optional Other Attachments” to attach.

This file must not exceed sixty (60) pages when printed on 8.5” by 11” paper with 1 inch margins (top, bottom, left, and right) with font not smaller than 11 point.

q. Life-Cycle GHG Emission Reduction Data

Applicants for this FOA must present life-cycle GHG emission reduction estimates for the proposed biofuel production technologies relative to petroleum gasoline and diesel. To do so, life-cycle GHG emissions of baseline gasoline and diesel must include the following stages:

- Petroleum recovery
- Petroleum transportation
- Petroleum refining
- Transportation and distribution of gasoline or diesel
- Combustion of gasoline or diesel on motor vehicles

Life-cycle analysis (LCA) of petroleum gasoline and diesel must be targeted to the timeframe of 2010-2015 during which both conventional crude and unconventional crude such as Canadian oil sands would be the supply pool of U.S. crude. The Department of Energy has been supporting LCA of baseline gasoline and diesel with the GREET[3] model developed at Argonne National Laboratory. Applicants may use the default LCA GHG emissions of gasoline and diesel for the U.S. in the GREET model.

For the advanced biofuels in individual proposals, applicants must present life-cycle GHG emissions of the proposed biofuel types. For the LCA of these biofuel types, applicants must specify the type of biomass feedstock, the logistics of getting feedstock from field to plant, energy and mass balance of the biofuel production process proposed, and the type and specification of the biofuel to be produced. The LCA of biofuels must include the following stages:

- Production of chemicals (e.g., fertilizers)
- Production of feedstock
- Transportation of feedstock
- Biofuel production
- Biofuel transportation and distribution
- Biofuel combustion in motor vehicles

Applicants may use DOE-funded GREET model or an equivalent tool to conduct LCA of their biofuels. In the case that the GREET model is modified in their own LCAs, applicants are required to specify the modifications made in GREET. If applicants decide to use LCA models, applicants are requested to provide general description of the modeling approach.

[3]Argonne National Laboratory GREET Model
http://www.transportation.anl.gov/modeling_simulation/GREET/index.html

Topic Area 5 and 6 Applicants Only: The application must provide a credible life cycle analysis for the "primary product" that demonstrates at least an 80 percent reduction in lifecycle greenhouse gas emissions when compared to the comparable motor vehicle fuel lifecycle emissions during calendar year 2005.

r. Petroleum Displacement Analysis

The application must provide a credible petroleum displacement analysis. Applications will not be scored on the amount of petroleum displaced but rather on the reasonableness and thoroughness of the discussion. Applicants must use the format provided in Appendix I and save this document in a single file named "Petro.doc" and click on "Add Optional Other Attachments" to attach.

s. Project Execution Plan (PEP)

DOE WILL EVALUATE AND CONSIDER ONLY THOSE APPLICATIONS THAT ADDRESS SEPARATELY EACH MERIT REVIEW CRITERION IN THE PEP.

The PEP must include a detailed description of the activities/tasks to be performed in the project proposed under this FOA, a schedule for the accomplishment of the activities/tasks, a resource loaded plan including the spend plan associated with the activities/tasks, and the expected dates for the realization of the outcomes.

- This plan must identify key decision points and go/no-go decision criteria. Successful applicants will update this document during award negotiation and combine it with (or subsume it within) the Project Management Plan, and then must use this plan to report schedule and budget variances during the project.
- Additional guidance and instructions for the content of the PEP are included in Appendix D.
- The Work Breakdown Structure (WBS) must be included in the PEP and will count towards the page limit of this document.
- Projects must include a description of the scope of their current or pending DOE award and distinguish the scope from that in this application.

The document must not exceed 60 pages when printed on 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right) with font not smaller than 11 point. Save this plan in a single file named "ProjExecPlan.pdf" and click on "Add Optional Other Attachments" to attach.

t. SF-LLL Disclosure of Lobbying Activities

If applicable, complete SF- LLL. Applicability: If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the grant/cooperative agreement, you must complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying." The form is available in the optional document box on the grant application package page of grants.gov.

Documents listed below must be included as clearly marked appendices to your

application and will not count towards the Project Narrative page limit. Please note that some of the required documents listed below may have their own page limits to which you must adhere.

It is very important that the application and all supporting documents, including the Project Abstract, Project Narrative, and Project Execution Plan files, that will be used during the Merit Review Process do not contain any Personally Identifiable Information as described in Appendix F.

Summary of Required Forms/Files

Your application must include the following documents:
(All documents must be formatted to print on standard 8.5" by 11" paper with 1" margins (top, bottom, left and right) with font not smaller than 11 point.)

Name of Document	Format	File Name	Page Limit
SF 424 - Application for Federal Assistance	See Instructions	See Instructions	Fixed, use form
Project/Performance Site Location	See Instructions	PPSL.doc	See Instructions
Other Attachments Form: Attach the following files to this form:	See Instructions	See Instructions	See Instructions
Project Summary/Abstract File	PDF	Summary.pdf	1 page
Project Narrative File including Project Narrative Cover Sheet, justification for less than required applicant cost share (if applicable), and required appendices	PDF	Project.pdf	15 pages
Resume File	PDF	Resume.pdf	2 pages each
SF 424A Excel – Budget Information for Non-Construction Programs File	XLS	SF424A.xls	Fixed, use form
Budget Justification File	See Instructions	See Instructions	No limit
Letters of Commitment	PDF	See Instructions	3 pages each
Subaward Budget File(s), if applicable (including Budget Justification)	XLS	See Instructions	No limit
Budget for Federally Funded Research and Development Center (FFRDC) Contractor File, if applicable	PDF	See instructions	Fixed, use form
Authorization from cognizant Contracting Officer for FFRDC, if applicable	PDF	FFRDC_Auth.pdf	No limit
Environmental Questionnaire	PDF	Enviro.pdf	15 pages
Project Management Plan	PDF	PMP.pdf	35 pages
Historical, Current, and	XLS	TechandFinData.xls	Fixed, use form

Planned Technical and Financial Data			
Business and Commercialization Plan	PDF	BusComPlan.pdf	20 pages
Pro forma	XLS	Proforma.xls	Fixed, use form
IP Statement and Supporting Documentation	PDF	ProjectIP.pdf	5 pages
Process Flow Diagram and Supporting Data	PDF	PFD_Data.pdf	60 pages
Life-Cycle GHG Emission Reduction Data	XLS	LCA_GHG.xls	Use GREET output format or equivalent
Petroleum Displacement Analysis	See Instructions	Petro.doc	Use provided format in Appendix I
Project Execution Plan	PDF	ProjExecPlan.pdf	60 pages
SF-LLL Disclosure of Lobbying Activities, if applicable	See Instructions	See Instructions	See Instructions

D. SUBMISSIONS FROM SUCCESSFUL APPLICANTS

If selected for negotiation of an award, DOE reserves the right to request additional or clarifying information for any reason deemed necessary, including, but not limited to:

- Indirect cost information
- Other budget information
- Name and phone number of the Designated Responsible Employee for complying with national policies prohibiting discrimination (See 10 CFR 1040.5)
- Commitment Letter from Third Parties Contributing to Cost Sharing, if applicable
- NEPA documentation including an expanded Environmental Questionnaire

Because Recovery Act funds apply to awards under this announcement, additional certification requirements will be required for state or local governments. See Special Provisions located at: http://management.energy.gov/business_doe/business_forms.htm.

E. SUBMISSION DATES AND TIMES

Notice of Intent to Apply Due Date

- As described in IV.B.1, applicants are strongly encouraged to submit a Notice of Intent to Apply to: IBR_FOA@go.doe.gov no later than May 29, 2009, 11:59 PM Eastern Time.

Pre-application Due Date

- Pre-applications are not required; however, please note the discussion in IV.B.1 for submittal of a Notice of Intent to Apply.

Application Due Date

- Applications must be received by June 30, 2009, 11:59 PM Eastern Time. You are encouraged to transmit your application well before the deadline.

F. INTERGOVERNMENTAL REVIEW

- This program is not subject to Executive Order 12372 – Intergovernmental Review of Federal Programs.

G. FUNDING RESTRICTIONS

Cost Principles**.** Costs must be allowable in accordance with the applicable Federal cost principles referenced in 10 CFR Part 600. The cost principles for commercial organization are in FAR Part 31.

Pre-award Costs**.** Recipients may charge to an award resulting from this announcement pre-award costs for award/budget period 1 that were incurred within the ninety (90) calendar day period immediately preceding the effective date of the award, if the costs are allowable in accordance with the applicable Federal cost principles referenced in 10 CFR part 600. See the discussion of potentially allowable activities including preparatory R&D, applicability of the National Environmental Policy Act, related topics in appendices C, D and E.

Pre-award costs are incurred at the applicant's risk. DOE is under no obligation to reimburse such costs if for any reason the applicant does not receive an award or if the award is made for a lesser amount than the applicant expected.

H. SUBMISSION AND REGISTRATION REQUIREMENTS

1. Where to Submit

APPLICATIONS MUST BE SUBMITTED THROUGH FEDCONNECT TO BE CONSIDERED FOR AWARD. Submit electronic applications through the FedConnect portal. Information regarding how to submit applications via Fed Connect can be found at https://www.fedconnect.net/FedConnect/PublicPages/FedConnect_Ready_Set_Go.pdf.

Organizations with system-to-system capabilities with Grants.gov for their submissions may continue to use their systems, and their applications will be accepted in Grants.gov to be considered for award.

Further, it is the responsibility of the applicant, prior to the Application due date and time, to verify successful transmission.

2. Registration Process Requirements

To submit an application in response to this FOA, Applicants must be registered with FedConnect. Before you can register with FedConnect, you will need the following:

A. Your organization's DUNS (including plus 4 extension if applicable). If you don't know your organization's DUNS or if your organization does not have a DUNS, you

can search for it or request one at http://fedgov.dnb.com/webform/displayHomePage.do .

B. A federal Central Contractor Registration (CCR) account. If your organization is not currently registered with CCR, please register at www.ccr.gov before continuing with your FedConnect registration.

C. Possibly, your organization's CCR MPIN. If you are the first person from your organization to register, FedConnect will need to create an organization account. Only a person who knows your organization's CCR MPIN can do this. To find out who this is in your organization, go to http://www.ccr.gov/ and click **Search CCR**. Once you've found your organization, locate the Electronic Business Point of Contact.

After the initial FedConnect account is created, employees can register themselves without the MPIN. If you are not sure whether your organization has an account with FedConnect, complete the registration form and FedConnect will let you know if your organization is registered. (PLEASE REFER TO QUICK START GUIDE).

Applicants who are not registered with CCR and FedConnect should allow at least 21 days to complete these requirements. It is suggested that the process be started as soon as possible. For those Applicants already registered in CCR, the CCR registration must be updated annually at http://www.ccr.gov/Renew.aspx.

PART V - APPLICATION REVIEW INFORMATION

A. REVIEW CRITERIA

The review of the applications involves multiple steps. The review process consists of the following, and is discussed in detail in this part:

- Initial Compliance Review
- Comprehensive Technical Evaluation
- Oral presentations and request for additional, written clarification (optional)
- Program Policy Factor review
- Review and selection by the Selection Official

1. Initial Review Criteria

Prior to a comprehensive merit evaluation, DOE will perform an initial review to determine: (1) the applicant is eligible for an award; (2) the information required by the announcement has been submitted; (3) all mandatory requirements are satisfied; and (4) the proposed project is responsive to the objectives of the funding opportunity announcement. If an application fails to meet these requirements, it will be deemed non-responsive and eliminated from full Merit Review.

In order for a submittal to be deemed responsive, all documents in Part IV.C, "Summary of Required Forms/Files," must be complete. To aid the Merit Review Committee in their evaluation of the applications and determine which projects are worthy of funding, all forms must be completed. Incomplete forms will not be counted as a submittal and the application may be deemed non-responsive and eliminated from full Merit Review.

The Project Narrative Cover Sheet that is part of the "Project Narrative File" and will be used to aid the Initial Review process. The applicant must fill it in completely or the application will be determined to be non-compliant.

In addition to the above determinations, the following criteria must be met:

- A commitment to meet or exceed the minimum cost share is included with the application.
- The applicant has submitted only one application to one, and only one, topic area of this FOA. Each application must propose one, and only one, integrated biorefinery.
- The feedstock and primary product are acceptable as stated in the FOA Description.
- The facility will be located in the U.S. and the feedstock will be obtained from a domestic source.
- The Statement Regarding IP Rights must be included. (See Sub-part IV.C.o)
- Applicants to Topic Areas 5 and 6 must clearly state the ability of their proposed biofuel (the "primary product") to meet the provisions cited in EISA 2007, Section 207 (b) to achieve at least an 80 percent reduction in lifecycle greenhouse gas emissions when compared to the comparable motor vehicle fuel lifecycle emissions during calendar year 2005.

2. Merit Review Criteria

Following the Initial Compliance Review, all compliant applications will undergo the Comprehensive Technical Evaluation by a Merit Review Committee (MRC). This evaluation will consist of a merit review of the submitted written application. Applications will be evaluated against the merit review criteria shown below. This review may be followed by a DOE request for an oral presentation by the applicant for the highest ranked applications. In addition to, or in place of, the oral presentations, written clarifications or additional detail related to criteria responses may be requested.

The MRC application evaluation will consist of an examination of each application to ensure that the requirements are met as stated in this FOA, including the appendices. If an application does not address a requirement of this FOA and its appendices, or does not address it adequately in the opinion of the reviewers, the application's score will reflect the omission. Appendices such as D and E contain specific requirements and additional guidance on the information that must be submitted.

DOE intends to invite up to the ten (10) highest ranking applications in each Topic Area (1-6) to participate in oral presentations. The applicants will be provided with a list of clarification questions that will be developed after the Comprehensive Technical Evaluation. The applicants will be required to address the questions prior to the oral presentation. If not already submitted, the applicants will also be required to submit their final "Statement Regarding IP Rights" within 7 days of being invited to the oral presentation. Applicants that fail to submit answers to the clarification questions or the "Statement Regarding IP Rights" will have their invitation to the oral presentation revoked.

If determined necessary, the oral presentations by the highest ranked applicants will consist of two parts – the oral presentation (up to one hour) followed by a question and answer session (up to one hour), conducted by the MRC. The purpose of the oral presentation is to ensure that the MRC fully understands the details of the proposed project and has an opportunity to ask clarifying questions of the applicants. The oral presentation evaluation will consist of a critical examination of the quality of the responses to the FOA. As stated above, for those applicants who have not provided an acceptable intellectual property statement within 7 calendar days after the invitation to attend the oral presentation or if the statement does not meet the criteria in Sub-parts IV.C.o and VIII.F, the application will be excluded from further review, and the invitation to attend the oral presentation will be revoked.

A written request for clarification or additional detail may be employed by DOE in addition to, or in lieu of, the oral presentation. This information, if requested, may supplement or replace the oral presentation.

It is DOE's intent to schedule oral presentations, if determined necessary, within approximately 1 month after the applicants are notified. Unless otherwise stated in the notification letter, the presentation slides (only electronic slides, not viewgraphs), including hard paper copies, must be provided to DOE no less than five working days before the actual scheduled oral presentation meeting. Proprietary information must be marked as such on the slides.

The merit review criteria will be compared to the information provided by each applicant for meeting the objective outcomes of this FOA, and the results of the comparison establish the recommendations to the Selection Official as to which projects to consider for award. The budget information will also be used to evaluate the cost and value to DOE. The evaluation weights for the objective merit review criteria are shown as percentages for each criterion.

A final ranking of the applications will be made by the Merit Review Committee following the oral presentations and/or written clarifications.

DOE retains the right, at its discretion, to retain an independent engineer, financial, and other consultant(s) during the funding opportunity process including the merit review process and during the project performance period.

After the Merit Review Committee recommends applications to the Selection Official, the applications undergo a program policy factor review that will be conducted by DOE personnel. The program review factors are listed in Sub-part V.A.3. The Merit Review Committee's recommendations and the results of the program policy factor review will be sent to the Selection Official for use in selecting the applications for negotiation of an award.

Additional requirements and guidance for successfully addressing the criteria are provided in Appendices D, E and in the documents described in Sub-part IV.C.

Criterion 1 (35%) The application demonstrates the technical merit and rationale for the proposed project. The technical description of the proposed project convincingly presents and justifies that the proposed project:

- has data from previous bench- or pilot-scale work or other credible, validated sources to support the goals and objectives of the proposed project and is likely, from a technical perspective, to achieve the yields, conversion, and efficiency of each unit operation necessary to validate the goals and objectives of the proposed project;
- will be able to demonstrate the full integration of all unit operations in producing the "primary product", as defined in the FOA, Part I - Description section;
- has clearly defined the critical success factors and has a research, development and demonstration plan to successfully complete them at the proposed scale-up factor(s);
- has clearly defined the scope, schedule, and budget, that in combination demonstrate that the project will be able to achieve its goals, critical success factors, and objectives as planned;
- validates that the selected feedstock availability, site selection, and environmental permitting are understood and will be successfully addressed;
- incorporates novel or breakthrough technologies and/or technology applications; and
- has clearly defined and established the applicant's rights to use and commercialize the technology.
- has a clearly described, technically and financially sound, implementable plan (including resource allocation) to successfully complete the scope by September 30, 2015, while accelerating job creation and economic benefit.
- has the resources with core competencies to cover all project aspects.

Note that environmental permitting and compliance specifically includes compliance with the National Environmental Policy Act (NEPA).

Criterion 2 (35%) The applicant demonstrates credible economics and competitive advantages that justify the costs of research, development and demonstration of the proposed integrated biorefinery technology in order to proceed to commercial scale.

- The plan for commercialization and deployment and the technological advancement provided by the proposed project towards reaching the goals and objectives detailed in this FOA justify the use of Federal funding.
- The application describes the value proposition and demonstrates a clear understanding of it, and how the value proposition supports the goals and objectives of the FOA.
- The goals and objectives of the project proposed under this FOA are likely to lead to the eventual commercialization of the technology and biofuel or bioproduct. The applicant provides a credible explanation as to how the liquid transportation fuel(s) or bioproducts will be produced as the "primary product" and will be a profitable commodity at the time a commercial facility is forecast to be operational.
- The applicant presents a credible life-cycle analysis of the estimated greenhouse gas emission reductions of the primary product over a petroleum alternative as outlined in Part IV.C.q.
- The applicant presents a credible petroleum displacement analysis of the primary product over a petroleum alternative as outlined in Part IV.C.r.
- <u>For Topic 5 and 6 applications only:</u> The application provides a credible life cycle analysis for the "primary product" that demonstrates at least an 80 percent reduction in lifecycle greenhouse gas emissions when compared to the comparable motor vehicle fuel lifecycle emissions during calendar year 2005.

- The applicant demonstrates that it has the core competencies necessary to cover all commercialization and deployment aspects including but not limited to, feedstocks, engineering, conversion operations, process development, financing, and product marketing. Any partnerships with organizations such as industrial, academic, and national laboratories must be clearly defined, and the collective core competencies must cover all project aspects.
- The applicant or applicant team demonstrates:
  - experience with operating pilot-scale (for Topic Areas 1, 2, and 5) or demonstration-scale (for Topic Areas 3, 4, and 6) facilities including the ability to collect and analyze data, manage unexpected contingencies, and to troubleshoot problems;
  - that it has the knowledge, experience, and a record of successful scale-up and commercialization of new technologies; and
  - commercial-scale experience, including plant ownership and operation, permitting, environmental and siting compliance, feedstock acquisition, and raw material management, solids handling, solids separation, conversion, purification of products, etc.

Criterion 3 (30%) The application demonstrates knowledge and experience in project management techniques, methods, and practices and describes how the applicant will use them to successfully manage the project proposed for this FOA.

- A Stage Gate method, including go/no-go decision points, is described and coordinated with a resource loaded schedule including how it will be employed to measure progress towards achieving the stated critical success factors.
- The application demonstrates through the Project Management Plan and related documents that the applicant is likely to successfully complete the project scope within the total project budget and on schedule.
  - The application demonstrates that project management practices will be fully integrated with financial and business systems to measure project progress and enhance the probability of successful completion.
  - The application demonstrates the identification and consideration of risk, and the use of effective risk management and change control systems that will be put into full effect very early in the project and used to mitigate impacts.
  - The application demonstrates the knowledge of and a plan to address all environmental, health and safety, permitting, and compliance concerns.

3. Other Selection Factors

DOE will apply program review factors and include them in recommendations to the Selection Official. The selection official may consider the following program policy factors in the selection process:

- Geographic diversity per Section 932 of EPAct 2005
- Cost share in excess of the minimum required.
- Technological diversity including feedstock, conversion technology and products.
- Congruity to current DOE Portfolio. Project provides needed portfolio diversity, contributes to portfolio balance across priority technical areas, and /or provides needed

adjustment in portfolio risk profile to achieve desired balance with respect to technical approaches, stages of development, and technical and commercialization risks.

- Selection of applications which promote and enhance the objectives of the American Recovery and Reinvestment Act of 2009, P.L. 111-5, especially job creation, and/or preservation and economic recovery in an expeditious manner.

B. REVIEW AND SELECTION PROCESS

1. Merit Review

Applications that pass the initial compliance review will be subjected to a merit review in accordance with the guidance provided in the "Department of Energy Merit Review Guide for Financial Assistance." This guide is at: http://www.management.energy.gov/documents/meritrev.pdf.

2. Selection

The Selection Official may consider the merit review recommendations, program policy factors and the amount of funds available.

3. Discussions and Award

The Government may enter into discussions with a selected applicant for any reason deemed necessary, including, but not limited to: (1) the budget is not appropriate or reasonable for the requirement; (2) only a portion of the application is selected for negotiation of an award; (3) the Government needs additional information to determine that the recipient is capable of complying with the requirements in 10 CFR part 600; and/or (4) special terms and conditions are required. Failure to satisfactorily resolve the issues identified by the Government will preclude an award to the applicant.

C. ANTICIPATED NOTICE OF SELECTION AND NEGOTIATION OF AWARD DATES

- DOE anticipates notifying applicants selected for negotiation of an award by the end of December 2009.
- DOE must make awards no later than September 30, 2010.

Part VI - AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES

1. Notice of Selection

   DOE will notify applicants selected for negotiation of an award. This notice of selection is not an authorization to begin performance. (See Part IV.G with respect to the allowability of pre-award costs.)

   Organizations whose applications have not been selected will be advised as promptly as possible. This notice will explain why the application was not selected and will constitute the applicant's debriefing for this Funding Opportunity Announcement.

2. Notice of Award

An Award issued by the contracting officer is the authorizing Award document. It normally includes, either as an attachment or by reference: 1. Special Terms and Conditions; 2. Applicable program regulations, if any; 3. Application as approved by DOE; 4. DOE assistance regulations at 10 CFR part 600, or, for Federal Demonstration Partnership (FDP) institutions, the FDP terms and conditions; 5. National Policy Assurances To Be Incorporated As Award Terms; 6. Budget Summary; 7. Federal Assistance Reporting Checklist, which identifies the reporting requirements; 8. Intellectual Property provisions; and 9. Statement of Project Objectives.

B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

1. Administrative Requirements
   The administrative requirements for DOE grants and cooperative agreements are contained in 10 CFR Part 600 (See: http://ecfr.gpoaccess.gov).

2. Special Terms and Conditions and National Policy Requirements
   - The DOE Special Terms and Conditions for Use in Most Grants and Cooperative Agreements are located at http://www.management.energy.gov/documents/specialtermsandconditions0808.pdf. The National Policy Assurances To Be Incorporated As Award Terms are located at http://management.energy.gov/business_doe/1374.htm.
   - Special Provisions relating to work funded under American Recovery and Reinvestment Act of 2009, Pub. L. 111-5 shall apply. Also, the Office of Management and Budget may be promulgating additional provisions or modifying existing provisions. Those additions and modifications will be incorporated into the Special Provisions as they become available.

3. Intellectual Property Provisions
   The standard DOE financial assistance intellectual property provisions applicable to the various types of recipients are located at http://www.gc.doe.gov/financial_assistance_awards.htm.

4. Statement of Substantial Involvement
   Either a cooperative agreement or a TIA may be awarded under this program announcement. Prior to award, the DOE Specialist and DOE Project Officer will negotiate a Statement of Substantial Involvement for a cooperative agreement or a description of DOE's cooperative relationship with the recipient for a TIA.

C. REPORTING

Reporting requirements are identified on the Federal Assistance Reporting Checklist, DOE F 4600.2, attached to the award agreement. The proposed Checklist for this program can be found at https://www.eere-pmc.energy.gov/procurenet/FinancialAssistance/Forms/DOE_Forms/DOEF4600_2.doc.

Additional reporting requirements throughout the project will include updated pro formas and other financial information and forecasts, updated technical and business management plans, updated technical data and forecasts.

Special Provisions relating to work funded under American Recovery and Reinvestment Act of 2009, Pub. L. 111-5 shall apply. (Special Provisions are located at: http://management.energy.gov/business_doe/business_forms.htm.) Also, the Office of Management and Budget may be promulgating additional provisions or modifying existing provisions. Those additions and modifications will be incorporated into the Special Provisions as they become available.

PART VII - QUESTIONS/AGENCY CONTACTS

A. QUESTIONS

Questions regarding the content of the announcement must be submitted through the FedConnect portal. You must register with FedConnect to submit questions and to receive responses to questions. It is recommended that you register as soon after release of the FOA as possible to have the benefit of all responses. More information is available at https://www.fedconnect.net/FedConnect/PublicPages/FedConnect_Ready_Set_Go.pdf. DOE will try to respond to a question within 3 business days, unless a similar question and answer have already been distributed.

Questions pertaining to the **submission** of applications through FedConnect should be directed by e-mail to support@FedConnect.net or by phone to FedConnect Support at 1-800-899-6665.

B. AGENCY CONTACT(S)

E-mail: IBR_FOA@go.doe.gov

The Notice of Intent to Apply must be submitted to the above email box. Questions and other inquiries will not be answered through email. All questions and inquiries should be submitted through the "Submit Question" feature of FedConnect. (See Part A of this Part, above.)

PART VIII - OTHER INFORMATION

A. MODIFICATIONS

Notices of any modifications to this announcement will be distributed through the FedConnect portal. You can receive an email when a modification or an announcement message is posted by registering with FedConnect as an interested party for this FOA. It is recommended that you register as soon as possible after the release of the FOA, to ensure you receive timely notice of any modifications or other announcements.

B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE

DOE reserves the right, without qualification, to reject any or all applications received in response to this announcement and to select any application, in whole or in part, as a basis for negotiation of an award and/or award.

C. COMMITMENT OF PUBLIC FUNDS

The Contracting Officer is the only individual who can make awards or commit the Government to the expenditure of public funds. A commitment by anyone other than the Contracting Officer, either explicit or implied, is invalid.

D. PROPRIETARY APPLICATION INFORMATION

Patentable ideas, trade secrets, proprietary or confidential commercial or financial information, disclosure of which may harm the applicant, should be included in an application only when such information is necessary to convey an understanding of the proposed project. The use and disclosure of such data may be restricted, provided the applicant includes the following legend on the first page of the project narrative and all other documents that contain proprietary information and specifies the pages of the application which are to be restricted:

"The data contained in pages _____ of this application have been submitted in confidence and contain trade secrets or proprietary information, and such data shall be used or disclosed only for evaluation purposes, provided that if this applicant receives an award as a result of or in connection with the submission of this application, DOE shall have the right to use or disclose the data herein to the extent provided in the award. This restriction does not limit the government's right to use or disclose data obtained without restriction from any source, including the applicant."

To protect such data, each line or paragraph on the pages containing such data must be specifically identified and marked with a legend similar to the following:

"The following contains proprietary information that (name of applicant) requests not be released to persons outside the Government, except for purposes of review and evaluation."

E. EVALUATION AND ADMINISTRATION BY NON-FEDERAL PERSONNEL

In conducting the merit review evaluation, the Government will seek the advice of qualified non-Federal personnel as reviewers. The Government will also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The applicant, by submitting its application, consents to the use of non-Federal reviewers/administrators. Non-Federal reviewers must sign conflict of interest and non-disclosure agreements prior to reviewing an

application. Non-Federal personnel conducting administrative activities must sign a non-disclosure agreement.

F. INTELLECTUAL PROPERTY DEVELOPED UNDER THIS PROGRAM

Patent Rights. The government will have certain statutory rights in an invention that is conceived or first actually reduced to practice under a DOE award. 42 U.S.C. 5908 provides that title to such inventions vests in the United States, except where 35 U.S.C. 202 provides otherwise for nonprofit organizations or small business firms. However, the Secretary of Energy may waive all or any part of the rights of the United States subject to certain conditions. (See "Notice of Right to Request Patent Waiver" in paragraph G below.)

Rights in Technical Data. Normally, the government has unlimited rights in technical data created under a DOE agreement. Delivery or third party licensing of proprietary software or data developed solely at private expense will not normally be required except as specifically negotiated in a particular agreement to satisfy DOE's own needs or to insure the commercialization of technology developed under a DOE agreement.

Special Protected Data Statutes. This program is covered by a special protected data statute. The provisions of the statute provide for the protection from public disclosure, for a period of up to 5 years from the development of the information, of data that would be trade secret, or commercial or financial information that is privileged or confidential, if the GO only information had been obtained from a non-Federal party. Generally, the provision entitled, Rights in Data − Programs Covered Under Special Protected Data Statutes, (10 CFR 600 Appendix A to Subpart D), would apply to an award made under this announcement. This provision will identify data or categories of data first produced in the performance of the award that will be made available to the public, notwithstanding the statutory authority to withhold data from public dissemination, and will also identify data that will be recognized by the parties as protected data.

Statement Regarding IP Rights: As required above in section IV.C.o, each applicant must completely describe their rights to use and commercialize the technology necessary to carry out the proposed project as described in its application.

Applicants that will proceed to the oral presentations will be required to re-certify their intellectual property rights within 7 days after being invited to attend oral presentations and prior to executing all phases of the Award. Failure to adequately demonstrate clear ownership of these intellectual property rights will result in the application being deemed non-compliant and the application will be excluded from further review.

G. NOTICE OF RIGHT TO REQUEST PATENT WAIVER

Applicants may request a waiver of all or any part of the rights of the United States in inventions conceived or first actually reduced to practice in performance of an agreement as a result of this announcement, in advance of or within 30 days after the effective date of the award. Even if such advance waiver is not requested or the request is denied, the recipient

will have a continuing right under the award to request a waiver of the rights of the United States in identified inventions, i.e., individual inventions conceived or first actually reduced to practice in performance of the award. Any patent waiver that may be granted is subject to certain terms and conditions in 10 CFR 784.

Domestic small businesses and domestic nonprofit organizations will receive the patent rights clause at 37 CFR 401.14, i.e., the implementation of the Bayh-Dole Act. This clause permits domestic small business and domestic nonprofit organizations to retain title to subject inventions. Therefore, small businesses and nonprofit organizations do not need to request a waiver.

H. NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES

Eligible activities under this program include those which describe and promote the understanding of scientific and technical aspects of specific energy technologies, but not those which encourage or support political activities such as the collection and dissemination of information related to potential, planned or pending legislation.

I. NOTICE OF RIGHT TO CONDUCT A REVIEW OF FINANCIAL CAPABILITY

DOE reserves the right to conduct an independent third party review of financial capability for applicants that are selected for negotiation of an award (including personal credit information of principal(s) of a small business if there is insufficient information to determine financial capability of the organization).

J. NOTICE OF POTENTIAL DISCLOSURE UNDER FREEDOM OF INFORMATION ACT

Applicants should be advised that identifying information regarding all applicants, including applicant names and/or points of contact, may be subject to public disclosure under the Freedom of Information Act, whether or not such applicants are selected for negotiation of an award.

REFERENCE MATERIAL

Appendix A – Definitions

"Amendment" means a revision to a Funding Opportunity Announcement

"Applicant" means the legal entity or individual signing the Application. This entity or individual may be one organization or a single entity representing a group of organizations (such as a Consortium) that has chosen to submit a single Application in response to a Funding Opportunity Announcement.

"Application" means the documentation submitted in response to a Funding Opportunity Announcement. NOTE: Application is referred to as Proposal in IIPS.

"Authorized Organization Representative (AOR)" is the person with assigned privileges who is authorized to submit grant or other financial assistance applications through Grants.gov on behalf of an organization. The privileges are assigned by the organization's E-Business Point of Contact designated in the CCR.

"Award" means the written documentation executed by a DOE Contracting Officer, after an Application is approved, which contains the negotiated terms and conditions for providing Financial Assistance to the Recipient. A Financial Assistance Award may be a Cooperative Agreement or a TIA.

"Bioproduct" for the purpose of this FOA, means any cost-effective, high-value biobased chemical or substitute for a petroleum-based feedstock or product.

"Budget" means the cost expenditure plan submitted in the Application, including both the DOE contribution and the Applicant Cost Share.

"Competitive Advantage" means the favorable position that occurs when a firm delivers the same services as its competitors but at a lower cost. It may also result from a firm's delivering greater services for the same price as its competitors.

"Consortium (plural: Consortia)" means the group of organizations or individuals that have chosen to submit a single Application in response to a Funding Opportunity Announcement.

"Contracting Officer" means the DOE official authorized to execute Awards on behalf of DOE and who is responsible for the business management and non-program aspects of the Financial Assistance process.

"Cooperative Agreement" means a Financial Assistance instrument used by DOE to transfer money or property when the principal purpose of the transaction is to accomplish a public purpose of support or stimulation authorized by Federal statute, and Substantial Involvement (see definition below) is anticipated between DOE and the Applicant during the performance of the contemplated activity.

"Cost Share" for the purpose of this FOA, means the respective share of Total Project Costs to be contributed by the Applicant and by DOE. The percentage of Applicant Cost Share is to be applied to the Total Project Cost (i.e., the sum of Applicant plus DOE Cost Shares) rather than to the DOE contribution alone.

"Central Contractor Registry (CCR)" is the primary database which collects, validates, stores and disseminates data in support of agency missions. Funding Opportunity Announcements which require application submission through Grants.gov require that the organization first be registered in the CCR at http://www.grants.gov/CCRRegister.

"Credential Provider" is an organization that validates the electronic identity of an individual through electronic credentials, PINS, and passwords for Grants.gov. Funding Opportunity Announcements which require application submission through Grants.gov require that the individual applying on behalf of an organization first be registered with the Credential Provider at https://apply.grants.gov/OrcRegister.

"Data Universal Numbering System (DUNS) Number" is a unique nine-character identification number issued by Dun and Bradstreet (D&B). Organizations must have a DUNS number prior to registering in the CCR. Call 1-866-705-5711 to receive one free of charge. http://www.grants.gov/applicants/request_duns_number.jsp

"E-Business Point of Contact (POC)" is the individual who is designated as the Electronic Business Point of Contact in the CCR registration. This person is the sole authority of the organization with the capability of designating or revoking an individual's ability to conduct CCR transactions.

"E-Find" is a Grants.gov webpage where you can search for Federal Funding Opportunities in FedGrants. http://www.grants.gov/search/searchHome.do

"FedConnect" is where federal agencies post opportunities and make awards via the web. Any Applicant can view public postings without registering. However, registered users have numerous added benefits including the ability to electronically submit Applications / Responses to the government directly through this site. https://www.fedconnect.net/FedConnect/

"Federally Funded Research and Development Center (FFRDC)" means a research laboratory as defined by Federal Acquisition Regulation 35.017.

"Financial Assistance" for the purpose of this FOA, means the transfer of money or property to a Recipient to accomplish a public purpose of support authorized by Federal statute through Cooperative Agreements or TIAs and sub-awards. For DOE, it does not include direct loans, loan guarantees, price guarantees, purchase agreements, Cooperative Research and Development Agreements (CRADAs), or any other type of financial incentive instrument.

"Funding Opportunity Announcement (FOA)" is a publicly available document by which a Federal agency makes known its intentions to award discretionary grants, cooperative

agreements or TIAs, usually as a result of competition for funds. Funding opportunity announcements may be known as program announcements, notices of funding availability, solicitations, or other names depending on the agency and type of program.

"Grant" means a Financial Assistance instrument used by DOE to transfer money or property when the principal purpose of the transaction is to accomplish a public purpose of support or stimulation authorized by Federal statute, and no Substantial Involvement is anticipated between DOE and the Applicant during the performance of the contemplated activity.

"Grants.gov" is the "storefront" web portal which allows organizations to electronically find and apply for competitive financial assistance opportunities from all Federal grant-making agencies. Grants.gov is THE single access point for over 900 grant programs offered by the 26 Federal grant-making agencies. http://www.grants.gov

"High Impact Feedstock" is a feedstock that is domestically available and has the agronomically and ecologically sustainable ultimate availability potential of at least 100 million dry metric tonnes of biomass per year.

"Indian Tribe" means any Indian tribe, band, nation, or other organized group or community, including Alaska Native village or regional or village corporation, as defined in or established pursuant to the Alaska Native Claims Settlement Act (85 Stat. 688)[43 U.S.C. § 1601 et seq.], which are recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians.

"Integrated Biorefinery (IBR)" for the purpose of this FOA, is a facility that uses an acceptable feedstock meeting the requirements described in this FOA that produces an acceptable biofuel or bioproduct and may produce heat and power as co-products.

"Key Personnel" means the individuals who will have significant roles in planning and implementing the proposed Project on the part of the Applicant and Participants, including FFRDCs.

"Marketing Partner Identification Number (MPIN)" is a very important password designated by your organization when registering in CCR. The E-Business Point of Contact will need the MPIN to assign privileges to the individual(s) authorized to perform CCR transactions on behalf of your organization. The MPIN must have 9 digits containing at least one alpha character (must be in capital letters) and one number (no spaces or special characters permitted).

"Participant" for purposes of this Funding Opportunity Announcement only, means any entity, except the Applicant substantially involved in a Consortium, or other business arrangement (including all parties to the Application at any tier), responding to the Funding Opportunity Announcement.

"Personally Identifiable Information (PII)" Any information about an individual maintained by an agency, including but not limited to, education, financial transactions, medical history, and criminal or employment history and information that can be used to distinguish or trace an

individual's identity, such as their name, social security number, date and place of birth, mother's maiden name, biometric records, etc., including any other personal information that is linked or linkable to an individual. Additional information is located in Appendix F.

"Primary Product" is the commodity to be offered for sale resulting from the operation of the integrated biorefinery that produces the highest total energy output as measured in British Thermal Units. The total energy output is not based on the energy per unit of product but rather the production rate of the product multiplied by its energy per unit. For the purpose of the FOA, any application proposing a biofuel as the primary product must produce a fuel that is liquid at standard temperature and pressure. Although a proposed technology may potentially produce multiple fuels and products, only the amount of biofuel or bioproduct derived directly from a feedstock that is acceptable under the topic area to which the application is submitted will be considered for the purposes of determining the primary product.

"Principal Investigator (PI)" refers to the technical point of contact/Project Manager for a specific project award.

"Project" means the set of activities described in an Application that is approved by DOE for Financial Assistance (whether such Financial Assistance represents all or only a portion of the support necessary to carry out those activities).

"Proposal" is the term used in IIPS meaning the documentation submitted in response to a Funding Opportunity Announcement. Also see Application.

"Recipient" means the organization, individual, or other entity that receives a Financial Assistance Award from DOE, is financially accountable for the use of any DOE funds or property provided for the performance of the Project, and is legally responsible for carrying out the terms and condition of the award.

"Selection" means the determination by the DOE Selection Official that negotiations take place for certain Projects with the intent of awarding a Financial Assistance instrument.

"Selection Official" means the DOE official designated to select Applications for negotiation of an Award under a subject Funding Opportunity Announcement.

"Substantial Involvement" means involvement on the part of the Government. DOE's involvement may include shared responsibility for the performance of the Project; providing technical assistance or guidance which the Applicant is to follow; and the right to intervene in the conduct or performance of the Project. Such involvement will be negotiated with each Applicant prior to signing any agreement.

"Technology Investment Agreement (TIA)" is an assistance instrument to support or stimulate research projects involving for-profit firms, especially commercial firms that do business primarily in the commercial marketplace. TIAs are different from grants and cooperative agreements in that the award terms may vary from the Government-wide standard terms (See DOE TIA regulations at 10 CFR Part 603). The primary purposes for including a TIA in the

type of available award instruments are to encourage non-traditional Government contractors to participate in an R&D program and to facilitate new relationships and business practices. A TIA can be particularly useful for awards to consortia (See 10 CFR 603.225(b) and 603.515, Qualification of a consortium).

"Total Project Cost" means all the funds to complete the effort proposed by the Applicant, including DOE funds (including direct funding of any FFRDC) plus all other funds that will be committed by the Applicant as Cost Sharing. Note that in this FOA, it is used interchangeably with Total Allowable Cost and Total Project Budget. Note that, as used in this FOA, none of these terms allow contingency or management reserve funds to be included as allowable costs.

"Tribal Energy Resource Development Organization or Group" means an "organization" of two or more entities, at least one of which is an Indian Tribe (see "Indian Tribe" above) that has the written consent of the governing bodies of all Indian Tribes participating in the organization to apply for a grant or loan, or other assistance under 25 U.S.C. § 3503.

"Value Proposition" means the unique added value an organization offers customers through its operations, and it refers to the benefits that stakeholders are assured of receiving as a result of their relationship with the organization. It also relates to a business's promise to deliver the expected experience with their product or service, and why a consumer should buy a business's product or service.

Appendix B

EPAct 2005 Sec. 932. BIOENERGY PROGRAM

(a) DEFINITIONS:—In this section:

(1) BIOMASS.—The term "biomass" means—

(A) any organic material grown for the purpose of being converted to energy;

(B) any organic byproduct of agriculture (including wastes from food production and processing) that can be converted into energy; or

(C) any waste material that can be converted to energy, is segregated from other waste materials, and is derived from—

(i) any of the following forest-related resources: mill residues, precommercial thinnings, slash, brush, or otherwise non-merchantable material; or

(ii) wood waste materials, including waste pallets, crates, dunnage, manufacturing and construction wood wastes (other than pressure-treated, chemically-treated, or painted wood wastes), and landscape or right-of-way tree trimmings, but not including municipal solid waste, gas derived from the biodegradation of municipal solid waste or paper that is commonly recycled.

(2) LIGNOCELLULOSIC FEEDSTOCK.—The term "lignocellulosic feedstock" means any portion of a plant or coproduct from conversion, including crops, trees, forest residues, and agricultural residues *not specifically grown for food,* [emphasis added] including from barley grain, grapeseed, rice bran, rice hulls, rice straw, soybean matter, and sugarcane bagasse.

(b) PROGRAM.—The Secretary shall conduct a program of research, development, demonstration, and commercial application for bioenergy, including—

(1) biopower energy systems;

(2) biofuels;

(3) bioproducts;

(4) integrated biorefineries that may produce biopower, biofuels, and bioproducts;

(5) cross-cutting research and development in feedstocks; and

(6) economic analysis

(c) BIOFUELS AND BIOPRODUCTS.— The goals of the biofuels and bioproducts programs shall be to develop, in partnership with industry and institutions of higher education—

(1) advanced biochemical and thermochemical conversion technologies capable of making biofuels from lignocellulosic feedstocks that are price-competitive with gasoline or diesel in either internal combustion engines or fuel cell-powered vehicles;

(2) advanced biotechnology processes capable of making biofuels and bioproducts with emphasis on development of biorefinery technologies using enzyme-based processing systems;

(3) advanced biotechnology processes capable of increasing energy production from lignocellulosic feedstocks, with emphasis on reducing the dependence of industry on fossil fuels in manufacturing facilities; and

(4) other advanced processes that will enable the development of cost-effective bioproducts, including biofuels.

(d) INTEGRATED BIOREFINERY DEMONSTRATION PROJECTS—

(1) IN GENERAL.—The Secretary shall carry out a program to demonstrate the commercial application of integrated biorefineries. The Secretary shall ensure geographical distribution of biorefinery demonstrations under this subsection. The Secretary shall not provide more than $100,000,000 under this subsection for any single biorefinery demonstration. In making awards under this subsection, the Secretary shall encourage—

(A) the demonstration of a wide variety of lignocellulosic feedstocks;

(B) the commercial application of biomass technologies for a variety of uses, including –

(i) Liquid transportation fuels;

(ii) High-value biobased chemicals

(iii) Substitutes for petroleum-based feedstocks and products; and

(iv) Energy in the form of electricity or useful heat; and

(C) the demonstration of the collection and treatment of a variety of biomass feedstocks.

(2) PROPOSALS.—Not later than 6 months after the date of enactment of this Act, the Secretary shall solicit proposals for demonstration of advanced biorefineries. The Secretary shall select only proposals that—

(A) demonstrate that the project will be able to operate profitably without direct Federal subsidy after initial construction costs are paid; and

(B) enable the biorefinery to be easily replicated.

EISA 2007

Sec.201.DEFINITIONS

Section 211(o)(1) of the Clean Air Act (42 U.S.C. 7545(o)) is amended to read as follows:

"(1) DEFINITIONS.—In this section:

"(A) ADDITIONAL RENEWABLE FUEL.—The term 'additional renewable fuel' means fuel that is produced from renewable biomass and that is used to replace or reduce the quantity of fossil fuel present in home heating oil or jet fuel.

"(B) ADVANCED BIOFUEL.—

"(i) IN GENERAL.—The term 'advanced biofuel' means renewable fuel, other than ethanol derived from corn starch, that has lifecycle greenhouse gas emissions, as determined by the Administrator, after notice and opportunity for comment, that are at least 50 percent less than baseline lifecycle greenhouse gas emissions.

"(ii) INCLUSIONS.—The types of fuels eligible for consideration as 'advanced biofuel' may include any of the following:

"(I) Ethanol derived from cellulose, hemicellulose, or lignin.

"(II) Ethanol derived from sugar or starch (other than corn starch).

"(III) Ethanol derived from waste material, including crop residue, other vegetative waste material, animal waste, and food waste and yard waste.

"(IV) Biomass-based diesel.

"(V) Biogas (including landfill gas and sewage waste treatment gas) produced through the conversion of organic matter from renewable biomass. [Note: For the purpose of this FOA, biogas is not an eligible biofuel, because it is not a liquid transportation fuel at standard temperature and pressure.]

"(VI) Butanol or other alcohols produced through the conversion of organic matter from renewable biomass.
"(VII) Other fuel derived from cellulosic biomass.

SEC. 207. GRANTS FOR PRODUCTION OF ADVANCED BIOFUELS.

(a) IN GENERAL.—The Secretary of Energy shall establish a grant program to encourage the production of advanced biofuels.

(b) REQUIREMENTS AND PRIORITY.—In making grants under this section, the Secretary—

(1) shall make awards to the proposals for advanced biofuels with the greatest reduction in lifecycle greenhouse gas emissions compared to the comparable motor vehicle fuel lifecycle emissions during calendar year 2005; and

(2) shall not make an award to a project that does not achieve at least an 80 percent reduction in such lifecycle greenhouse gas emissions.

(c) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated to carry out this section $500,000,000 for the period of fiscal years 2008 through 2015.

Appendix C – Cost Share Information

Cost Sharing or Cost Matching

The terms "cost sharing" and "cost matching" are often used synonymously. Even the DOE Financial Assistance Regulations, 10 CFR Part 600, use both of the terms in the titles specific to regulations applicable to cost sharing. DOE almost always uses the term "cost sharing," as it conveys the concept that **non-federal share is calculated as a percentage of the Total Project Cost.** An exception is the State Energy Program Regulation, 10 CFR Part 420.12, State Matching Contribution. Here "cost matching" for the non-federal share is calculated as a percentage of the federal funds only, rather than the Total Project Cost.

How Cost Sharing Is Calculated

As stated above, cost sharing is calculated as a percentage of the Total Project Cost. Following is an example of how to calculate cost sharing amounts for a project with $1,000,000 in federal funds with a minimum 20% non-federal cost sharing requirement:

Formula: Federal share ($) divided by Federal share (%) = Total Project Cost
Example: $1,000,000 divided by 80% = $1,250,000

Formula: Total Project Cost ($) minus Federal share ($) = Non-federal share ($)
Example: $1,250,000 minus $1,000,000 = $250,000

Formula: Non-federal share ($) divided by Total Project Cost ($) = Non-federal share (%)
Example: $250,000 divided by $1,250,000 = 20%

See the sample cost share calculation for a blended cost share percentage below. **Keep in mind that FFRDC funding is DOE funding.**

What Qualifies For Cost Sharing

While it is not possible to explain what specifically qualifies for cost sharing in one or even a couple of sentences, in general, if a cost is allowable under the cost principles applicable to the organization incurring the cost and is eligible for reimbursement under a DOE grant or cooperative agreement, then it is allowable as cost share. Conversely, if the cost is not allowable under the cost principles and not eligible for reimbursement, then it is not allowable as cost share. In addition, costs may not be counted as cost share if they are paid by the Federal Government under another award unless authorized by Federal statute to be used for cost sharing.

The rules associated with what is allowable as cost share are specific to the type of organization that is receiving funds under the grant or cooperative agreement, though are generally the same for all types of entities. The specific rules applicable to:

- Institutions of Higher Education, Hospitals, and Other Nonprofit Organizations are found at 10 CFR600.123;
- State and Local Governments are found at 10 CFR600.224;
- For-profit Organizations are found at 10 CFR600.313.

In addition to the regulations referenced above, other factors may also come into play such as timing of donations and length of the project period. For example, the value of ten years of donated maintenance on a project that has a project period of five years would not be fully allowable as cost share. Only the value for the five years of donated maintenance that corresponds to the project period is allowable and may be counted as cost share.

Additionally, DOE generally does not allow pre-award costs for either cost share or reimbursement when these costs precede the signing of the appropriation bill that funds the award. In the case of a competitive award, DOE generally does not allow pre-award costs prior to the signing of the Selection Statement by the DOE Selection Official. Also, some costs, such as international travel require pre-authorization by DOE.

The National Environmental Policy Act (NEPA) applies to all DOE financial assistance activities. In determining actions that will occur prior to award, applicants must consider the applicability and impacts of NEPA compliance. If you move forward with activities that are not authorized for federal funding by the DOE Contracting Officer in advance of the final NEPA decision, you are doing so at risk of not receiving federal funding and such costs may not be recognized as allowable cost share. See Appendix E for additional information on NEPA including further discussion of activities that are planned to be carried out prior to award.

Following is a link to the DOE Financial Assistance Regulations. You can click on the specific section for each Code of Federal Regulations reference mentioned above.

DOE Financial Assistance Regulations:
http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=98a996164312e8dcf0df9c22912852b0&rgn=div5&view=text&node=10:4.0.1.3.9&idno=10

As stated above, the rules associated with what is allowable cost share are generally the same for all types of organizations. Following are the rules found to be common, but again, the specifics are contained in the regulations and cost principles specific to the type of entity:

(A) *Acceptable contributions.* All contributions, including cash contributions and third party in-kind contributions, must be accepted as part of the recipient's cost sharing if such contributions meet all of the following criteria:

(1) They are verifiable from the recipient's records.

(2) They are not included as contributions for any other federally-assisted project or program.

(3) They are necessary and reasonable for proper and efficient accomplishment of project or program objectives.

(4) They are allowable under the cost principles applicable to the type of entity incurring the cost as follows:

(a) *For-profit organizations.* Allowability of costs incurred by for-profit organizations and those nonprofit organizations listed in Attachment C to OMB Circular A–122 is determined in accordance with the for-profit costs principles in 48 CFR Part 31 in the Federal Acquisition Regulation, except that patent prosecution costs are not allowable unless specifically authorized in the award document.

(b) *Other types of organizations.* Allowability of costs incurred by other types of organizations that may be subrecipients under a prime award is determined as follows:

(i) *Institutions of higher education.* Allowability is determined in accordance with OMB Circular No. A-21 -- Cost Principles for Educational Institutions

(ii) *Other nonprofit organizations.* Allowability is determined in accordance with OMB Circular A-122, Cost Principles for Non-Profit Organizations

(iii) *Hospitals.* Allowability is determined in accordance with the provisions of 45 CFR Part 74, Appendix E, Principles for Determining Costs Applicable to Research and Development Under Grants and Contracts with Hospitals

(iv) *Governmental organizations.* Allowability for State, local, or federally recognized Indian tribal government is determined in accordance with OMB Circular No. A-87, Cost Principles for State, Local, and Indian Tribal Governments

(5) They are not paid by the Federal Government under another award unless authorized by Federal statute to be used for cost sharing or matching.

(6) They are provided for in the approved budget.

(B) *Valuing and documenting contributions*

(1) *Valuing recipient's property or services of recipient's employees.* Values are established in accordance with the applicable cost principles, which mean that amounts chargeable to the project are determined on the basis of costs incurred. For real property or equipment used on the project, the cost principles authorize depreciation or use charges. The full value of the item may be applied when the item will be consumed in the performance of the award or fully depreciated by the end of the award. In cases where the full value of a donated capital asset is to be applied as

cost sharing or matching, that full value must be the lesser or the following:

(a) The certified value of the remaining life of the property recorded in the recipient's accounting records at the time of donation; or
(b) The current fair market value. If there is sufficient justification, the contracting officer may approve the use of the current fair market value of the donated property, even if it exceeds the certified value at the time of donation to the project. The contracting officer may accept the use of any reasonable basis for determining the fair market value of the property.

(2) *Valuing services of others' employees.* If an employer other than the recipient furnishes the services of an employee, those services are valued at the employee's regular rate of pay, provided these services are for the same skill level for which the employee is normally paid.

(3) *Valuing volunteer services.* Volunteer services furnished by professional and technical personnel, consultants, and other skilled and unskilled labor may be counted as cost sharing or matching if the service is an integral and necessary part of an approved project or program. Rates for volunteer services must be consistent with those paid for similar work in the recipient's organization. In those markets in which the required skills are not found in the recipient organization, rates must be consistent with those paid for similar work in the labor market in which the recipient competes for the kind of services involved. In either case, paid fringe benefits that are reasonable, allowable, and allocable may be included in the valuation.

(4) *Valuing property donated by third parties.*

(a) Donated supplies may include such items as office supplies or laboratory supplies. Value assessed to donated supplies included in the cost sharing or matching share must be reasonable and must not exceed the fair market value of the property at the time of the donation.

(b) Normally only depreciation or use charges for equipment and buildings may be applied. However, the fair rental charges for land and the full value of equipment or other capital assets may be allowed, when they will be consumed in the performance of the award or fully depreciated by the end of the award, provided that the contracting officer has approved the charges. When use charges are applied, values must be determined in accordance with the usual accounting policies of the recipient, with the following qualifications:

(i) The value of donated space must not exceed the fair rental value of comparable space as established by an independent appraisal of comparable space and facilities in a privately-owned building in the same locality.

(ii) The value of loaned equipment must not exceed its fair rental value.

(5) *Documentation.* The following requirements pertain to the recipient's supporting records for in-kind contributions from third parties:

(a) Volunteer services must be documented and, to the extent feasible, supported by the same methods used by the recipient for its own employees.

(b) The basis for determining the valuation for personal services and property must be documented.

Appendix D – Requirements and Guidance for Preparing Responses

Introduction

The purpose of this appendix is to assist applicants in developing their response to the Funding Opportunity Announcement (FOA) criteria. This appendix provides a discussion of the requirements and guidance in order to help the applicant focus its response to the subjects that DOE considers important. This aligns with the guidance that will be given to the Merit Review Committee (MRC) to direct its evaluation of the applications and assess the applicant's ability to prepare an application that addresses the goals of the FOA.

It is important to note that the FOA goals and objectives support achieving the requirements, goals, and intent of the relevant legislation. (See FOA, Part I.) This FOA focuses on: 1) the near term (limited research and development, piloting, and demonstration of the proposed technology); and 2) future commercialization and widespread use of the technology/process. To achieve this, the application must include discussion of the project the applicant proposes to be funded under the FOA. The criteria also require the applicant to provide preliminary, estimated technical and financial information for a forecast commercial facility that would have the same technology/process, and primary product as the project proposed for the FOA. For an application under Topic Areas 1 - 4, the commercial-scale facility must use the feedstock proposed in the application and produce the same proposed primary product. For an application under Topic Areas 5 or 6, the commercial-scale facility must use a lignocellulosic or algae feedstock that is a "High Impact Feedstock" as defined in Appendix A and produce the same proposed primary product. For all topic areas, the applications must include a detailed basis/justification for scale-up. The application also requires that the transition from the project proposed under the FOA to a forecast commercial facility be described.

As stated in Part V of the FOA, applicants must ensure that all criteria are addressed in terms of the applicant's historical performance, experience, data (including the objectives and quality control measures for collecting the data), as well as their current ability and future plans to rapidly advance the proposed technology to commercialization.

The application (including all required attachments) should be written to fully address each criterion. In its evaluations, deliberations, and scoring, the MRC is not allowed to use any information from any source, except what is provided in the application. References to other documents or to websites for additional information, photographs, data, etc. will be ignored by the MRC. MRC panel members are also forbidden from obtaining additional information by contacting the applicant or other parties. This restriction is required so each application will be evaluated based on a standardized and consistent set of information.

It is recognized that some of the information requested in the Project Execution Plan, the Business and Commercialization Plan, the Project Management Plan and some of the forms will overlap and some will not be applicable to all proposed technologies/processes. This is inevitable, so guidance is provided in this appendix to guide the applicant in placing the information in the proper document.

This appendix is meant to guide the applicants on preparing selected parts of their application. It

is not meant to be all-inclusive, and the applicant should include information as appropriate in the application documents. The applicant may include additional clarifying information as long as the page limit is not exceeded. Each submitted document must be within the stated page limit defined in the FOA, Part IV.C.

Examples of documents in which the applicant is required to provide technical and financial information on the proposed project in several formats include the following: the project narrative cover sheet; the pro forma; the "Process Flow Diagram and Supporting Data" form; and, and the "Historical, Current, and Planned Technical and Financial Data" form. These forms are needed to ensure the MRC and DOE receive the information needed to conduct a fair and complete review of each application.

Depending on the proposed project, it may be necessary to substitute other information that better addresses the criteria. Applicants must not deviate from providing the required information in the required format. The staff conducting the compliance review and the MRC are expected to make a reasonable effort to find the required information and data in the application. They are not required to extensively search for, calculate, or to compare information that is not presented in the specified format.

If information requested in a form is not relevant to the application or the units are not applicable, the justification for the change should be stated in the application. At the discretion of the MRC, if the justification is not sound or the information provided is not a reasonable substitute for the required information, the score likely will be lowered or the application may be deemed non-responsive.

1. Project Narrative (FOA, Subpart IV.C.b)

The narrative should present an overview of the project and include the topics specified in the FOA, Subpart IV.C.b.)

Ensure the "Project Narrative Cover Sheet" is inserted as page 1 of the Project Narrative and that it is completely and accurately filled out. The answers on this form will be used during the Initial Compliance Review.

For the project proposed in response to the FOA – Summarize the project objectives, goals and targets, critical success factors, the major actions that will be completed to meet them, and the schedule for completing them. State the value proposition for the project and explain how it will be met. (See Appendix A for the definition of "value proposition" as it is used in the FOA.) Include a summary of the major project activities, such as planning, design, construction, and the research and development (R&D) plan.

Forecast commercial-scale facility – Regardless of the topic area to which the applicant is applying and assuming the project meets its goals and targets and successfully addresses the critical success factors, describe/forecast how the technology and process developed from the project will lead to the eventual construction of a commercial-scale facility. For applications under Topic Areas 1, 2, 3, and 4, the commercial-scale facility must use the feedstock proposed

in the application and produce the same primary product. For applications under Topic Areas 5 and 6, the commercial-scale facility must use a lignocellulosic or algae feedstock that is a "High Impact Feedstock" as defined in Appendix A.

Note: The activities, goals, and targets forecast to occur after completion of the project proposed for the FOA and any that may occur related to but outside of the scope of the proposed project should be clearly delineated from those that will occur within the scope of the proposed project. For example, applicants to the pilot-scale topic areas would need to discuss the scale up from pilot-scale to demonstration scale and then to commercial scale.

2. Merit Review Criteria Discussion

As stated in the FOA, the PEP must include a section formatted to address each sub-criterion listed in Part V. A. of the FOA. Provide sufficient information on each sub-criterion to enable the reviewers' evaluation of the application in accordance with the criteria.

DOE WILL EVALUATE AND CONSIDER ONLY THOSE APPLICATIONS THAT SEPARATELY ADDRESS EACH MERIT REVIEW CRITERION AND SUB-CRITERION IN THE PEP.

General Guidance on Responding to the Criteria

When writing the response to the criteria, the applicants must remain aware that the scope and budget of the proposed project includes all activities planned for the project regardless of who (DOE, Recipient, sub-recipient, vendor, etc.) actually provides the resource/funding or completes the activity.

If there are related activities that will support or are critical to the completion of the proposed project, but they are outside the scope of the project proposed in response to the FOA, they should be discussed. However, they must be clearly delineated as not being within the proposed scope. Additionally, related activities that occur before the start of the proposed project or that are reasonably anticipated to occur after it may be included to explain or clarify, but those activities and accomplishments should be clearly identified and distinguished from the activities that will be within the scope of the proposed project.

> Example: An applicant for Topic Area 2 owns a pilot plant that will continue to operate after the date the application is submitted. Data from some unit operations from the pilot plant will be used in the design of the demonstration facility that is planned to be constructed under the award resulting from the FOA. The applicant plans to continue to pay all of the costs for operating the pilot plant and for collecting and analyzing the data.
>
> In this example, the applicant would discuss the work being done at the pilot plant that supports or is otherwise directly related to the project proposed under this FOA. The discussion would include pertinent information such as the benefits and expected inputs to the proposed project as well as the risks and impacts if the inputs are not completed as planned. The discussion should be carefully written to ensure the importance of the

activities at the pilot plant to the conduct of the proposed project are clear, but also distinguish that such activities will not be done within scope or budget of the proposed project. The hand-off/transfer point of the data should be defined if it is significant, and a milestone or go/no go decision point should be included in the schedule.

2.1 CRITERION 1

The information used to demonstrate the likelihood of success of the project proposed in response to the FOA should be described in the application and in particular in the PEP. The description will be supplemented by the, Environmental Questionnaire, budget documents, the Project Management Plan, the "Historical, Current, and Planned Technical and Financial Data" form, the pro forma for the proposed project, and the IP information.

Goals, targets and critical success factors should be supported by specific activities that demonstrate how they will be achieved. Assumptions must be accompanied by explanations of the basis for the assumption, the risks and impacts associated with the assumptions, and the activities the project will take to address the assumption, such as contingency planning.

Considerable positive weight will be given to those applications which demonstrate:

- novel or breakthrough technologies
- the likelihood of successful completion of the project of the project, including alignment of the project's goals and objectives with those of the FOA, value in terms of the budget compared to the potential outcomes. (This specifically includes the timeliness and degree to which the proposed project supports the Recovery Act goals and schedule.)
- biorefinery technologies and systems that can proceed rapidly and cost effectively to commercialization.

By definition, "successful" includes timely.

Regardless of the topic area to which the applicant applies, the application must provide evidence of the proposed process maturity that justifies proceeding to the scale planned in the application. Information supporting the evidence should be provided in the PEP and detailed evidence is required in the "Historical, Current, and Planned Technical and Financial Data" forms. (See FOA, Subpart IV.C.l.)

2.1.1 Project Execution Plan (PEP). (FOA, Subpart IV.r) The Project Execution Plan must include the following information. Regardless of the format used in the overall PEP, the PEP must address each of the Merit Review Criteria and sub-criteria.

- A work breakdown structure (WBS) is required for the project scope, and a resource loaded schedule must should be prepared that aligns with the WBS. Both the WBS and the resource loaded plan should be followed or referenced throughout this application wherever possible.

  The Work Breakdown Structure (WBS) must be included in the PEP and will count towards its page limit.

  Note: There are many books and articles published on WBS use and development, and a

significant amount of information is also available free of charge on the Internet. The applicant may find the information in the documents on the following webpage useful in understanding a WBS and its relationship to other project planning and control methods and systems including earned value management and value engineering: http://management.energy.gov/policy_guidance/earned_value_management.htm

The project's activities should be outlined in the WBS and the resource loaded schedule. The activities in the PMP should correlate to the activity descriptions in the responses to criteria 1 and 2 (that is, in the PEP and the Business and Commercialization Plan), but should be summarized and condensed into typical WBS elements (that is, descriptive phrases or very short sentences). Please DO NOT repeat the detailed description of activities submitted in the PEP or the Business and Commercialization Plan.

No particular level of the WBS is required to be submitted in the application. Based on applications to previous FOAs, it is recommended that the WBS submitted include activities to level 3 or 4, but each applicant should determine what level is best for their purposes of defining their project. Applicants who have developed a detailed WBS, but due to page limitations does not want to submit all of it, should include a description of the level of detail to which their WBS has been developed and explain its status (such as, initial draft, accepted and in use by an EPC, etc.)

- Discuss the resource loaded plan and describe key activities. The schedule should be based on the WBS and be aligned with the budget and spend plan. The schedule should include time periods for conceptual and detailed design, procurement, construction, start-up and shake-down, any R&D, as well as development of environmental and land-use agreements, obtaining permits and licenses, and completing the NEPA process.

  It should also include the activities related to the DOE award such as: data collection and prepare standard and Recovery Act required status reports, prepare annual reports and updated pro formas, and submit award completion documents including property disposition, pro forma, final technical report, and final IP report. The schedule should clearly identify all go/no go decision points for all project phases including the R&D plan. Examples of go/no go decision points include but are not limited to:
  - hold points for obtaining financing including DOE or other loan guarantees
  - results from R&D work that is important to the success of the project
  - obtaining feedstock, offtake, rights-of-way and other agreements
  - third party installation of supporting infrastructure (for example, rail lines, utilities, public roads, drains and sewers)
  - third party development of required information or equipment
  - results of NEPA documentation
  - economics

  Please note the award/budget period completion criteria, especially for award/budget period 2, when completing the schedule and budget. See Part II.F and Appendix G, Typical Award Structure.

  The schedule must show that the project will submit a full and complete application and be

under award and complete spending no later than as stated in the FOA Part II.F, Period of Performance. The schedule for obtaining financing should be included if it is a significant factor in the schedule. However, no project costs associated with obtaining financing are allowable, and they may not be included in either the DOE or the applicant's cost share.

To facilitate meeting the schedule and achieving the critical success factors for these projects, communications between DOE and the Awardees will be crucially important. In addition to budgeting for routine communications with DOE, the applicant must include resources needed for 1) attending DOE Peer Reviews, program-level Stage Gate and other meetings (typically 3-5 days for preparation and travel each year during the project period), 2) project kick off and review meetings including Stage Gate(s), 3) annual attendance at one or more DOE sponsored conferences (similar to the Biomass 2008 and 2009 conferences), and 3) miscellaneous meetings and accompanying the IE and DOE representatives on site visits.

Include the planned period of operation of the proposed biorefinery to successfully demonstrate the feasibility of the technology and the justification for the proposed duration of the test. The operation should include sufficient time to demonstrate the reliability and maintenance issues of the biorefinery to the satisfaction of prospective equity or debt partners. A pilot or demonstration plan summary that includes data collection, analysis and data reconciliation should be included. In addition, discuss how the team will respond to unexpected data or problems that might need reconfiguration or modifications of the operating facility.

The FOA makes it clear that prior expenditures, such as for R&D, facility construction or otherwise developing a platform for doing R&D, will not be reimbursed by DOE and will not be allowed as cost share. Therefore, the scope and costs for prior expenditures must not be included in the proposed project. "Prior expenditures" would include all costs incurred before award. However, some costs may be allowed that are accrued during the 90-day period prior to award. The accrued costs must meet the requirements for reasonableness, allowability, and allocability. In planning for the use of accrued costs, the applicant must also consider the potential constraints on certain preliminary activities based on compliance with NEPA. More information on cost share is in Appendix C and NEPA is discussed in Appendix E.

The applicant should expect that, if selected for negotiation of an award, and as a condition to receiving an award, DOE or a DOE contractor such as a DOE Independent Engineer, financial consultant, project management consultant, or other advisor(s) will review the proposed scope and budget and will advise DOE regarding the reasonableness, allowability and allocability of the proposed modifications. DOE may consider the information received when negotiating the award. This also applies to new facilities, as it is considered part of DOE's routine due diligence for these projects.

In making the decision as to what to include in the proposed project scope, the applicant should also consider any issues involving protection and ownership of intellectual property developed from the R&D.

Example: An applicant who owns a pilot plant that is in good operating condition submits an application for a substantially different technology and process. The proposed process would use the basic infrastructure of the existing facility, but would require modifications (added feedstock handling equipment, process equipment and materials, and expanded laboratory capabilities, for example).

In this example, the applicant would need to describe the existing facility and its capabilities, and all modifications that would be necessary to the existing facility to complete the proposed project. The scope and budget for modifications would be acceptable, however; the applicant could not include budget or scope associated with pre-project activities, continuing operations of the existing facility, or maintenance of the facility that does not directly apply to the modified process. Costs to refurbish or repair existing equipment that is necessary for use in the modified process could be included in the proposed project, but it must be clearly shown in the application that the equipment is directly needed for the proposed project (that is, it is needed for the substantially different technology that is being proposed). If a particular piece of equipment is common to both the proposed process and to other, existing processes, only the apportioned costs of refurbishment or repair directly related to the proposed project may be included in the total project cost.

- Describe the proposed project, highlighting features of the facility that support comprehensive process data collection at the proposed scale. Examples include such features as ease of modification, exchange or addition of equipment and access to monitor and maintain the facility components.

- Describe the proposed technology and the fully integrated process. The application must contain sufficient information to convincingly demonstrate the full integration of all unit operations, including waste and recycle operations.

  Discuss the current status of the technologies that are known or likely to become competitors with the proposed technology and how they compare to it. Emphasize the comparative strengths and weaknesses of the proposed technology.

  Summarize the validated bench- or pilot-plant data that forms the basis for the design of the proposed biorefinery. Complete the "Process Flow Diagram and Supporting Data" form (see FOA, Part IV.C.p) for each process step or unit operation.

  Include summaries or descriptions of process engineering evaluations that justify the readiness of the process for operation at the proposed scale. This includes thorough evaluations of process chemistry, closed mass and energy balances, solids handling issues, materials of construction, corrosion issues, waste management issues, control and instrumentation issues and the engineering involved in product isolation, characterization, and purification. These evaluations must be based on and described with references to findings from prior work.

  The scale-up factors to be employed in the facility proposed under the FOA should be

justified based on scalability of individual processes or process steps. The applicant should forthrightly identify those areas that would face the largest uncertainties of scaling from the existing scale to the proposed scale up through full scale commercial operation and what actions will be taken to mitigate the scale-up risks. The information should conform to the information on process unit operations and related issues provided in the "Process Flow Diagram and Supporting Data Form" (see FOA, Subpart IV.C.p.) and need not be repeated in detail in the PEP.

Rating Discussion: This information will be used during the review to assess the likelihood, from a technical perspective, that the applicant will be able to achieve the yields, conversion, and efficiency of each unit operation necessary to validate the goals and objectives of the proposed project. Additionally, the information will be used to assess the likelihood of the successful demonstration of the full integration of all unit operations in producing the "primary product", as defined in the "Description" section of the FOA.

Rating Discussion: When evaluating Criterion 1, the merit reviewers will be considering and using the information submitted on unit operations and integration from a historical perspective, as well as analyzing it for forecasting and reasonableness of scale up. Therefore, it is very important that all key unit operations be thoroughly discussed in response to the "Process Flow Diagram and Supporting Data" documentation. Failure to include sufficient information on any unit operation(s) will likely be considered a significant weakness and will have a severe, negative impact on the application's score.

Rating Discussion: Applications should describe the basis and plan for achieving the scale up. Statements that the applicant will be able to achieve the scale up based on its experience with similar processes may be germane, but should not be relied on solely for addressing this criterion. Applications that provide both a basis/plan for the scale up and describe directly applicable experience will typically be scored higher than applicants without one or the other.

The applicant must have sufficient integrated pilot-scale data, or non-integrated demonstration-scale data using the proposed feedstock. The MRC will typically score an application much lower and may determine the application is non-responsive if it is proposing use of a feedstock for which the applicant lacks sufficient data. If the applicant proposes a feedstock that is not exactly the same as the one for which they have data, the applicant should provide a detailed and technically compelling argument for the basis for using the substitute. The comparison should be based on the comparability and compatibility of the feedstock with the proposed technology including chemical and physical properties.

The process flow diagram(s) (PFDs) for the proposed biorefinery must be included in the "Process Flow Diagram and Supporting Data" application attachment, and they should be referenced as needed in the discussion in this and other sections of the PEP and supporting documents. (See FOA, subpart IV.C.p.) The PFDs should have been developed using information from prior piloting or process development activities. Describe each unit operation that is part of the next scale facility that is not included in the proposed biorefinery.

Explain why it does not need to be operated as part of the proposed biorefinery to develop the necessary design data for scale-up to production. Typically these units are outside any major recycle operation and are performing a common process. A plan must be included on how the scale-up data for these unit operations will be developed. Examples might include:

- ethanol rectification and dehydration – beer column overheads will be sampled and distillation simulation will be used to design these unit operations because they are standard practice
- lignin combustion – significant quantities of lignin generated in this process will be sent off site to be tested for combustion properties by the combustor manufacturer who will also guarantee the unit
- solids drying – samples will be sent to the vendor for testing and unit operation design and guarantee.

- Describe in detail the data and information that will be obtained from the proposed project and how it will be used to complete process engineering for a commercial-scale plant. Justify the ability to scale up from the proposed biorefinery to a future commercial facility. For applications for Topic Areas 1, 2, and 5, also include information on the scale up from the pilot scale to the demonstration scale and then to the commercial.

- Critical Success Factors, Barriers, and Competitive Advantage for the Project Proposed Under the FOA –

  The discussion of these specific topics in the PEP should include from the present through operation of the project proposed under the FOA. The PEP should address the questions, below.

  "Competitive Advantage" as used in the FOA is defined in Appendix A.

  <u>Competetive Advantage, Critical Success Factors and Barriers</u>

  - What have been the critical success factors that lead to considering scaling this process to the scale called for in the FOA? What barriers have been resolved or overcome during previous research, development or demonstration?
  - Provide explanations of how the performance and/or economics of previous bench- or pilot-scale operations justify proceeding with a more detailed and larger design at the scale proposed under the FOA.
  - Have all the barriers in previous evaluations been addressed and overcome? If so, how?
  - What are the plans for the proposed biorefinery to address the remaining potential technical barriers?
  - What will be the critical success factors for this demonstration that will lead to consideration of proceeding to a full-scale commercial demonstration?
  - Will the future commercialization rely on technology that is not being addressed/developed in the proposed project? Are there any barriers or critical success factors controlled by entities other than the applicant? (Example: An enzyme developer whose performance is crucial to the project success but is not part of the applicant's team and is therefore not obligated to perform.)

- What are the competing processes and feedstocks for producing the proposed end product(s) and what is the competitive advantage of the proposed process. That is, why is it better?
- How does the proposed process advance technology or further national goals (e.g. energy security)?

Due to the urgency to meet the FOA goals, timely completion of the projects is of very high importance. Therefore, the schedule and the assessment of the ability of the applicant to meet the proposed schedule will carry significant weight in the scoring of this criterion. It is recommended that the applicants consider successful completion of the project on schedule as a critical success factor.

Note that the potential impacts of business, project, and technology risk assessment and management for future scale up and commercialization should be discussed, in the Business and Commercialization Plan which is , discussed later in this appendix.)

- Construction of a New Facility or Modifications to an Existing Facility

The PEP must describe and justify the **technical and financial** aspects of the plan to construct a new facility or for using an existing facility (with or without) modification. This should include a detailed economic breakdown with a description and cost estimates of reasonable alternatives.

The use of existing facilities (requiring modification or not) is encouraged when it is financially and technically feasible. It is not the intent of the FOA for DOE to pay back in whole or in part applicant's incurred expenses or obligations related to previously completed work (or complementary work completed outside of the proposed project scope). This includes, but is not limited to, any of the following: research, development, design, supplies, stockpiled feedstock, crop development, marketing, engineering, equipment (capital or otherwise), or existing facilities. These types of expenses will not be allowed as DOE or Recipient cost share.

Applicants proposing to use existing facilities or equipment may include costs related to using the facility in the proposed budget. Applicants should review the relevant financial assistance regulations for guidance as to what restrictions apply to proposed costs and should pay particular attention to the prohibition on a recipient or sub-recipient obtaining fee (making a profit). A breakdown of the basis for the amount is required. Project funding (DOE and cost share) will only be applicable during the time the facility is being specifically used for the approved scope for the proposed project. The MRC will review the proposed costs and will consider if the costs are appropriate and directly support the FOA's and the project's goals and expected outcomes. See also FOA, Appendix C, Cost Share Information.

Note: DOE may conduct its own review of the costs for the projects selected for award and may choose to negotiate the amounts proposed in the application.

Rating Discussion: The application must explain and justify the technical and budgetary aspects of the plan to construct a new facility or to use an existing facility (with or

without) modification. The MRC will be advised that neither approach is to be generally preferred over the other. The MRC will score each application based on its assessment of the proposed activities and how well the use of the proposed biorefinery will facilitate successfully completing the activities and efficiently and cost effectively meet the technical goals, targets and critical success factors on time and within budget.

- Siting considerations and compliance with NEPA and Environmental, Health and, Safety requirements for the proposed project

Summarize the program and procedures that will be used for ensuring compliance with the National Environmental Policy Act (NEPA) and Federal, state and local environmental, siting, and zoning requirements specifically for the project proposed under the FOA. Similar information will be included in the Business and Commercialization Plan for the forecast commercial-scale facility and need not be repeated in the PEP.

Environmental compliance information for the facility that will be used for this project must be provided in the Environmental Questionnaire application attachment which may be referenced as needed to the PEP and other application documents. If major activities will occur at more than one facility, the applicant should provide the information for them, also. (See specific guidance on NEPA in Appendix E of the FOA).

- Discuss product, byproduct, waste management, waste streams, pollution controls, and pollution prevention.
- For a new site, provide justification and benefits for developing a new site. Information should support and be related to the information provided in the preceding item, Construction of a New Facility or Modifications to an Existing Facility to align with the discussions of cost management, sharing of resources or utilities, transportation infrastructure, and other relevant information.
    - If the proposed equipment and processes will be integrated into an existing facility, provide an explanation of the benefits and justification for the site selection.
- The siting considerations discussion must include environmental considerations related to feedstock sources and availability.
- Provide information on who holds title to the land or existing facilities. Proof of rights to use the land or the existing facility for a biorefinery must be provided for the scheduled period of performance.

Rating Discussion: For Criterion 1, applications that show more maturity of siting planning (including holding property rights) and that provide the information required in the Environmental Questionnaire will score higher than those that do not.

Rating Discussion: Significant weight will be placed on the quality, completeness and level of understanding demonstrated by the applicant's response to the Environmental Questionnaire, including environmental and siting permits and approvals. Additional weight will be placed on the reviewers' assessment of the understanding of the potential impacts of NEPA considerations and

environmental permitting, and the mitigating measures planned to address them. Failure to adequately and correctly address environmental, health and safety compliance and mitigation will very likely be considered by the MRC to be a significant weakness that could have a severe impact on the score for this criterion.

Rating Discussion: Due to the substantial potential impacts on the proposed project for failure to adequately address site selection issues and possible risks involving moving to another site, the application would likely receive a significant deficiency for the criterion unless the PEP and supporting documents such as the Environmental Questionnaire contain convincing evidence of the stability and carefully studied selection of the site, including potential impacts related to economics, traffic, zoning, geography, demography, existing conditions, etc.

Financial Assurances - Include information describing the types of financial assurances that are in place to ensure the project will be funded through completion. For projects with simple financing situations, this discussion could discuss the plans for self-financing the Recipient's cost share. If cost share will be provided by others, this section could reference the letters of commitment and explain the roles of the providers. Examples of topics include: related/complementary/supplementary R&D investments to date by the team, ability to provide cost-share, evidence of track record for financing and implementing commercial-scale projects, and cash-on-hand available to complete the project. The applicant should show that it has financial assurances to fund potential cost overruns. Note that the funds DOE obligates to projects is fixed. As such, DOE does not include and does not provide funds for contingency or management reserve. Therefore, the applicant is responsible for establishing and maintaining adequate reserves.

Rating Discussion: An application containing undocumented commitments of resources from a source would be considered to have poorly met these instructions. Commitments with significant reservations or conditions would be considered as having diminished ability to support meeting the project goal and objectives.

Rating Discussion: A commitment from a sub-awardee stating the specific role, responsibilities, authority and estimated number of hours that a person will be available to work on the proposed project is preferred over a statement that only says the person will work on the project.

Describe availability, feasibility and economic viability of major consumables (such as catalyst or fermentative organisms) and materials. Discuss any plans for materials testing during the project (e.g. coupon testing).

Explain the methods employed to estimate capital construction costs and operating costs and contingency and management reserve,

If the applicant intends to sell the product(s) directly produced from the facility that is

constructed or modified for the project built or modified in response to the FOA, provide information on off-take agreements, and identify customer(s) for the products being produced including any commitments to purchase products produced. If the customer is internal to the Recipient's company, provide documentation of need by the internal customer.

- Describe the instrumentation and control systems to be installed, including discussion of the use of the equipment to facilitate collection of data to address scale up to the next scale, including the following: procedures, temperature, corrosion, impurity, pressure, and control/instrumentation issues. If the instrumentation and control systems do not mimic that of the next scale facility, justify the basis for not doing so.

- Feedstock Management for the Proposed Project – Describe the collection, transportation, storing, and processing of feedstock required to assess the technology at the proposed scale. Ensure the feedstock description aligns with the cost estimates provided in the Business and Commercialization Plan, "Historical, Current, and Planned Technical and Financial Data" and the pro forma. (Note that for the sake of clarity, the applicant may want to include in the PEP some information on feedstock-related costs associated with the forecast commercial-scale facility, but that information will be discussed in detail in the Business and Commercialization Plan.)

  As applicable, consider the following in responding to Criterion 1.

  - Feedstock Availability – Definitively demonstrate how the proposed feedstock and biofuel or biobased chemicals meet the FOA eligibility requirements. Include estimates of available feedstock volumes and delivered costs to the plant gate that would support the extended operation of the proposed biorefinery to fulfill its purpose.
  - If available, include any demonstrations of commitment by feedstock suppliers.
  - Feedstock source management - Describe in detail the method for growing, harvesting, transporting, handling and storing large quantities of feedstocks specifically for the proposed biorefinery. If a feedstock is proposed that requires novel equipment or changes to existing agricultural practices, plans to develop and deploy these systems must be presented.
  - Feedstock interface with plant - Describe how the envisioned feedstock collection, storage, transportation and pretreatment/preparation (if any) will be integrated into the operation and costs of the biorefinery being proposed.

    Rating Discussion: A detailed feedstock availability and cost study will result in a higher score than assurances from a grower that the feedstock supply will be available.

    Rating Discussion: Demonstrated availability and experienced suppliers and processors capable of meeting or exceeding the designed throughput would rate higher than an application that simply states the feedstocks will be available when and where needed.

- Preparatory R&D –

The purpose of the FOA is to validate technology at the pilot and demonstration scale as opposed to developing new technology. As stated in the FOA, the project funding that will be allowed to be spent on preparatory research and development and piloting is limited, typically to approximately 10% of the total project cost. However, based on the information provided in the application, DOE may agree during negotiations to allow justified and reasonable R&D costs over and above 10%. As with the rest of the scope and budget in the proposed project, the need for completing the R&D proposed should be clearly explained and justified in the application, and the applicant must still complete the "Process Flow Diagram and Supporting Data" form (see FOA, Part IV.C.p) for each process step or unit operation.

The MRC and DOE will likely consider activities planned prior to piloting or demonstration, such as but not limited to the following as being "preparatory R&D" regardless of the stated purpose for which they will be done: technology development, or for engineering and design purposes, or the scale at which they are done: experiment or data quality confirmation; validation of proposed methods, techniques, or procedures; equipment, component or materials testing; modeling; catalyst development or durability testing; ethanologen or enzyme scale-up viability; and, non-integrated pilot or demonstration scale testing.

In deciding how much preparatory R&D to include in the project scope, the applicant should consider the goals of the FOA and the focus of the criteria on rapid deployment and commercialization. The FOA states that "time is of the essence" in getting the awards made and the scope completed.

An applicant proposing extensive preparatory R&D or R&D for which the outcome could be crucially important to the success of the project may wish to ask itself if it is submitting to the correct topic area, or consider if it is truly and demonstrably ready to apply to this particular FOA. The MRC's deliberations will constantly focus on readiness and the technical and financial ability to rapidly commercialize the technology if the proposal is awarded. The MRC will also assess value and risk. The projects applying to the FOA inherently have high risks (technical, financial, etc.), and helping industry address those risks is a significant part of why DOE is posting the FOA. However, the applicant needs to consider that DOE and the MRC will likely determine that projects proposing significant preparatory R&D have a much greater risk for impacts on the scope, schedule, and budget. Therefore, the applicant should proactively and forthrightly address (and quantify to the extent possible) the potential risks, impacts, and plans for mitigating negative or ambiguous outcomes from preparatory R&D.

- Applicant Experience, Capabilities, and Resources

  Provide information that describes the applicant's experience, capabilities, and resources to complete the project proposed in response to the FOA. The MRC will score based on the applicant's demonstration that it has the knowledge, experience, and record of successful scale-up and commercialization of new technologies. The application should explain if the depth and degree of the experience is broad-based and demonstrates

expertise in all proposed key technology areas, in design and build (if applicable to the applicant's proposed scope), and scale-up from bench testing to commercialization.

The role of all organizations involved should be clearly defined. The MRC will assess if the core competency of the applicant (including the applicant's team) covers all applicable project aspects, including but not limited to, feedstocks, engineering, conversion, NEPA and environmental permitting and siting, process development, financial, and operations and maintenance, and product marketing.

Describe key facilities that will be used in the conduct of the proposed project. Discuss the location, type and condition of equipment, adequacy and availability of the equipment and personnel to complete the work on schedule, the experience of operating (such as, operators, maintenance/repair, chemists, and engineers) and management personnel. Detailed inventories for the key facilities are not required, but enough information should be provided for the reviewers to understand the capabilities and abilities of the facilities and the staff.

As part of meeting this requirement, applicants must ensure that Letters of Commitment clearly describe the scope and any constraints/restrictions on the commitment. (See FOA, Subpart IV.C.f.) Where personnel are being offered for use by the project, their roles, responsibilities and level of effort should be clear and provide tangible value to the project. The letters should clearly state the responsibilities of the personnel or organization, including their authority within the proposed project (such as whether they are a vendor, advisor, decision maker, project level manager, work package level manager, etc.) Where equipment or facilities are offered, each should be described and the basis for their value provided in the budget justification if their use will be charged to the project. (See FOA, Subpart IV.C.g.)

Address the qualifications of the team undertaking the work, including an explanation of the following.

- Experience with feedstock and feedstock source management - Describe in detail:
    - the level of experience in sustainably growing, harvesting, transporting, handling and storing large volumes (100 dry metric tonnes per day or more) of biomass feedstocks specifically destined for industrial processing. Or (less preferably from an MRC rating standpoint), if the applicant or applicant's partner organization(s) does not currently have this experience, a plan should be presented for obtaining a partner with the required experience in this area.
    - document pertinent supplier/applicant experience in handling the specific, proposed biomass feedstock.

- Experience in operating similarly sized operations, including the ability to establish data quality objectives, analyze data, manage excursions from normal operations, and troubleshoot problems. Expertise in design/ build and scale-up. As applicable, provide evidence of commercial-scale experience in all proposed

key technology areas, including solids handling, solids separation, fermentation, chemical catalysis, purification of products, bioengineering, thermochemical processing, etc.

- Experience ensuring good team alignment, good communication, and conscious awareness of the importance of building good teams.
- Experience managing communications pathways within the team and between the team and outside entities, such as utilities, suppliers, fabricators, end-users, customers, DOE, etc.

- Demonstrate senior management buy-in to the planned project. The method used to demonstrate this requirement is at the discretion of the applicant. Merely having a senior manager sign the application will not be considered as having met the sub-criterion.

  Rating Discussion: Applicants that fail to demonstrate that the senior management in the key applicant organization(s) is fully cognizant of the application and plans will be considered to have a significant weakness and may be considered non-responsive.

- Decommissioning Plan Summary

  The Recipient is solely and wholly responsible for maintaining the facility in a safe, stable and compliant manner during and (as applicable) after the award period.

  If the applicant plans to mothball or decommission the facility, the application must include the schedule, estimate of costs, and description of the resources that will be used to decommission the facility or place it in a safe and stable condition. If a facility constructed under this award will not be mothballed or decommissioned, the application must include a description of the planned disposition for the facility, including an estimate of the costs of the disposition and the source of any resources needed.

  Decommissioning or mothballing costs are not allowable costs under these awards. Therefore, although a disposition plan and cost estimate is required, no costs for planning or taking any action to mothball or decommission the facility may be included in the Total Allowable Budget.

2.2 CRITERION 2

Criterion 2 focuses on the applicant's ability and capabilities to plan and carry out the commercialization and deployment of the technologies piloted or demonstrated in the project proposed under the FOA. The Business and Commercialization Plan, the pro forma, and other information submitted in the application for the project proposed for the FOA should show that the applicant will be able to move rapidly on to commercialization of the proposed technology on a scale that supports the goals of the FOA. The time frame the Business and Commercialization Plan covers is the period from the time at which a project is selected for negotiation of an award until a forecast commercial-scale facility is operating and producing the primary product in commercial quantities.

For an application under Topic Areas 1 - 4, the commercial-scale facility must use the feedstock proposed in the application and produce the same proposed primary product. For an application under Topic Areas 5 or 6, the commercial-scale facility must use a lignocellulosic or algae feedstock that is a "High Impact Feedstock" as defined in Appendix A and produce the same proposed primary product. For all topic areas, the applications must include a detailed basis/justification for scale-up.

The response to this criterion should assume the project proposed under the FOA achieves its economic and technical success factors. Based on that assumption, the application should describe the resources, business management, financial, legal technical and other factors involved with the eventual commercialization of the proposed technology, including marketing of product(s). The Business and Commercialization Plan must provide a reasonable scenario that describes how the proposed primary product (which must be an acceptable biofuel or bioproduct) could be successfully commercialized in the timeframe and in the volumes that would reasonably be expected to significantly contribute to the FOA's goals and objectives.

To facilitate the review and to provide important information in addition to what is in the Business and Commercialization Plan, the applicant is required to submit technical and financial information in several formats as required by the FOA in Subpart IV.C. It is understood that forecasting some of the market conditions, and financial data, for these projects will be difficult and that the degree of accuracy will vary from item to item in the forms. However, given the importance and urgency for achieving the FOA goals in a timely manner, the information provided by the Applicant to address Criterion 2 will help the MRC assess the Applicant's capability to realize the goals.

The discussion of the requirements and guidance for the criterion (below) provides additional information or clarification. It is meant to augment and not replace the criteria as written in Part V of the FOA.

It is very important that the application be written carefully to clearly distinguish between the information relating to the project proposed under the FOA and the projected/forecast first commercial facility and additional deployment.

> *Rating Discussion:* Applications that poorly distinguish between the scope of the proposed project and the related or future work that will be done outside of the scope will likely score lower than those that make clear distinctions.

<u>Required contents of the Business and Commercialization Plan and Related Documents</u>
The application should describe the resources, business management, financial, legal technical and other factors involved with the proposed project and extrapolate them to cover eventual commercialization of the proposed technology, including marketing of the product(s). The Business and Commercialization Plan must provide a reasonable scenario that describes how the proposed primary product (which must be an acceptable biofuel or biobased chemical) could be successfully commercialized in the timeframe and in the volumes that would reasonably be expected to significantly contribute to the FOA's goals and objectives.

The Business and Commercialization Plan must address the issues related to undertaking this effort to produce biofuels, bioproducts, and the other products proposed in the application. The applicant should determine what information to include, in addition to the following required information:

The Business and Commercialization Plan must include the following information.

- Describe how the work proposed in the application supports the forecast commercialization, and the outcomes of the project justify the investment of Federal funds.

  Note: The budget and the alignment with the goals and scope are sub-criteria under both Criterion 1 and 2. The difference between the two is that under Criterion 1, the scope for the project proposed under the FOA will be assessed by the MRC to determine the likelihood the project described in the PEP and supporting documents can be successfully completed by the applicant on schedule and within budget. For Criterion 2, the focus is on how well the proposed project will facilitate rapid commercialization and replication to meet the goals and objectives of the FOA. Criterion 2 addresses the issue of (given the overall costs and risks) whether or not the proposed project considering its forecast outcomes make funding it a good investment using Federal funds.

  Rating Discussion: The reviewers will consider the value including how well the cost of the proposed project supports meeting the goals and objectives under the FOA leading to the eventual commercialization of the technology and biofuel or biobased chemical.

  The application should demonstrate a clear understanding of the value proposition, and how the value proposition supports the goals and objectives of the FOA. Please refer to the definition of "value proposition" in Appendix A of the FOA.

  Rating Discussion: The MRC will review the proposed budget including any costs associated with using existing or planned facilities and will consider if the actual value or the value proposition are impacted negatively, positively or neutrally. If the MRC determines the value or value proposition are negatively impacted, it would likely result in a lower score under related criteria.

- Describe what is envisioned for the eventual commercialization of the proposed technology, and should expand on the overview in the project narrative (see FOA, Subpart IV.C.b) by providing more detail on commercialization and deployment including the envisioned long-term, major activities, costs, goals and targets. This includes a description of the forecast commercial-scale facility and the key processes, operations, and technology. It also includes (see below) a discussion of the forecast construction, operating, and other costs.

  Describe availability, feasibility and economic viability of major consumables (such as catalyst or fermentative organisms) and materials. Explain the methods employed to estimate capital construction costs and future operating costs.

  Based on the assumption that the critical success factors are met for the project proposed for

the FOA, the Business and Commercialization Plan must explain and justify the process for the successful deployment and commercialization of the proposed technology.

Financial Assurances - Include information, if available, describing the types of financial arrangements that are or will be in place to ensure the commercialization. Examples could include letters of commitment, related/complementary/supplementary R&D investments to date by the team, ability to provide cost-share, evidence of track record for financing and implementing commercial-scale projects, and cash-on-hand available to complete the project.

Continuity and continuous improvement - The applicant should show that it invests in and effectively uses R&D to further improve the technology with the goal of minimizing production costs. This should include a discussion of anticipated improvement from the facility proposed under the FOA to the forecast commercial facility. Also describe the anticipated use, if any, of the facility proposed under the FOA for on-going process improvement

Outputs and Business Strategies - Include an explanation of how the production of the outputs (fuels, products, etc) is consistent with the strategic business plans of the applicant and members of the applicant team.

Business Risks – Identify business risks associated with producing the planned product(s) including an estimate of changing market dynamics. Include labor and material cost fluctuations. Business, market and environmental risks for deploying additional operating facilities to other sites and the associated impact on the deployment schedule.

> *Rating Example:* An application that does not consider the changing market dynamics for the products being produced would be rated lower than one that contains a discussion of market realities and reasonably foreseen forecasts, now and in the future. Applications that provide a sensitivity analysis around the production and distribution of their product would be rated higher than one that does not.

1. Legal and Regulatory – Identify and discuss how legal and regulatory issues will be managed.

2. Liability insurance – Identify whether or not the team anticipates any issues in obtaining liability insurance for the plant or process. Provide evidence of ability to obtain liability insurance. The applications should discuss how the applicant will manage responsibility for liability and damages, including environmental damages.

3. Product Marketing and Deployment Plan – The Business and Commercialization Plan must provide explanations of the following.

   Forecast Commercial Facility

   - Planned schedule for construction of the first full commercial-scale operation.

- Planned schedule for deployment and commercialization of additional operations based on successfully achieving the goals and objectives.

- Identify customer(s) for the products being produced, including any commitments to purchase products produced. If the customer is internal to the company, provide documentation of need by the internal customer.

4. Configuration Control Management Plan Summary – For projects that intend to produce a product for sale during the award period, for each product, provide a description of the configuration control management including at least the following elements:
    - Configuration identification
    - Configuration change control (or change management)
    - Configuration status accounting
    - Configuration verification and auditing.

5. Technology and Market Conditions –
    - Describe the current status of the technology and market conditions for the product(s) that will be produced by the technology and the current and forecast market for the product(s), and the infrastructure needed to market the product(s).
    - The application must provide a resource loaded plan to gain acceptance, (if not already accepted) of the **primary product** (liquid transportation biofuel or bioproduct) into the marketplace.
        - If it assumed that the existing infrastructure will continue to exist at the time of the proposed commercialization, provide the basis for the assumption.
        - If the existing (as of the posting date of the FOA) infrastructure for production, transportation, brokering, and retail dispensing is not sufficient for marketing the primary product, or a new infrastructure will be required, describe the plans, budget, and schedule for establishment of the expanded or new infrastructure, including transportation and distribution. This information should be carefully coordinated with the information provided in the pro formas.
        - Describe the plans for obtaining licenses, certifications and standards that will be required for the product(s), including the organization(s) is assumed that will be responsible for leading and funding those efforts. For example, explain if the Applicant will fund and lead the efforts, or is it assumed others will do so. Include, as necessary, activities such as: motor vehicle manufacturer buy-in and approval, establishment of appropriate standards and approvals (for example, ASTM, SAE, UL), special infrastructure requirements such as storage and transfer material compatibility, and EPA certification of the biofuel and producers.

    Rating Discussion: A technology that has the potential to produce significant

volumes of liquid biofuel at a competitive price would score higher than one with lower volumes, non-competitive production costs, or that have little or no credible supporting documentation.

Rating Discussion: Integrated biorefinery systems that can be employed across multiple regions of the United States and with a wide range of feedstocks are desirable and will likely receive higher scores from the reviewers.

Rating Discussion: An application that simply states that another plant could be deployed if the pilot or demonstration is successful would rate lower than an application that outlines information such as the assumptions, issues and risks in building another facility and that provides a supporting pro forma and technical data.

Rating Discussion: An application professing to have competitive economics without explanation or detailed backup would likely be rated much lower than an application that fully justifies its process and marketing economics.

Rating Discussion: An application that cannot explain the advantages of its process over competing processes that produce like or similar products would be rated lower than one that can explain its position in the manufacturing arena.

Rating Discussion: Applications that define critical success factors for commercialization that include technical and economic metrics based on technical and process economic evaluations will rate higher than ones that simply provide success targets.

- Feedstocks for a Commercial-Scale Facility –
  The Business and Commercialization Plan should extrapolate the feedstock availability, costs and management for the project proposed under the FOA (as discussed in the PEP) to a forecast commercial-scale facility producing the same primary product and using the technology/process developed under the FOA. For an application under Topic Areas 1 - 4, the commercial-scale facility must use the feedstock proposed in the application and produce the same proposed primary product. For an application under Topic Areas 5 or 6, the commercial-scale facility must use a lignocellulosic or algae feedstock that is a "High Impact Feedstock" as defined in Appendix A and produce the same proposed primary product. For all topic areas, the applications must include a detailed basis/justification for scale-up.

  - Feedstock Availability – Demonstrate how the proposed feedstock(s) and biofuel(s) and biobased chemical(s) meet the eligibility requirements stated in the FOA. Include estimates of available feedstock volumes and delivered cost to the plant gate that support favorable economics in producing a biofuel or bioproduct as the primary product, as well as any co-products. The resource assessment and cost estimate data must be fully documented.

The availability of no-cost feedstocks is typically considered unrealistic. However, if an applicant can justify that it can obtain a no-cost feedstock with a long-term commitment by a supplier, and that it can replicate this in multiple places across the United States, this economic factor may weigh positively into the reviewers' assessment of the application.

- Feedstock Interface with plant - Describe how the envisioned feedstock collection, storage, transport and pretreatment/preparation (if any) will be integrated into the operation and costs of the biorefinery being proposed.

- Feedstock source management - Describe in detail the method for collecting or growing, harvesting, transporting, handling and storing large quantities of feedstocks specifically for a commercial facility. If a feedstock is proposed that requires novel equipment or changes to existing agricultural practices, plans to develop and deploy these systems at commercial scale must be presented.

- Describe any differences in feedstock and feedstock practices (collection and/or growing, harvesting, transporting, handling, storing and interfacing with the biorefinery) that may affect the economics and/or the process between the proposed biorefinery and a forecast commercial plant.

1. NEPA and Other Environmental Compliance for a Forecast Commercial Facility

- Include a section that forecasts and analyzes the environmental and siting requirements that would likely be applicable to a commercial facility that is assumed to use the technology/process from the project proposed under the FOA. The purpose is to demonstrate (given the available information) that the applicant has considered the potential impacts of the scale up and has prepared an informed, preliminary opinion that commercial-scale facilities potentially will be viable from the perspective of NEPA and other regulatory and siting concerns and that compliance requirements likely can be met.

  See the Environmental Questionnaire for an overview of some of the topics and issues the applicant may want to consider in preparing the response. However, given the requirement that this section be written at a summary level, it is not expected that each item in the checklist be discussed. Additional information will be required from projects selected for negotiation of an award.

  Rating Discussion: Minimally addressing this requirement by stating that the requirements and costs will be assessed at the time a decision is made to construct a commercial facility will be considered non-responsive.

- If the applicant has a likely site selected for the construction of the commercial facility, the regulations applicable to the location should be used. If the location is not known, the information submitted should be based on generic regulations (due to

the jurisdictional differences in regulations). It should state key assumptions, such as the assumed throughput, first date of operation, production of the primary product and any major co-products.

- An energy and environmental life cycle analysis of the process from the delivery of the feedstock at the plant gate to final products or other approaches should be described if it is not covered completely in the Life-Cycle Analysis, including an assessment of potential waste streams and emissions. (See Subpart IV.C.q. for discussion of the Life-Cycle Analysis.) Waste and pollution prevention methods, if known, should be briefly mentioned. The waste stream assessment should address steady state operations and anticipated process upsets by showing an estimate of the range of wastes and emissions that will need to be managed. (Note the additional requirements for Topic Areas 5 and 6 stated in Subpart IV.C.q.)

- Applicant Core Competencies and Experience for the Forecast Commercial Biorefinery

  The application should provide information that describes the applicant's experience, capabilities, and resources to progress from the project proposed in response to the FOA to the forecast commercialization and deployment. This includes that the applicant demonstrates it has the knowledge, experience, and record of successful scale-up and commercialization of new technologies. The application should explain if the depth and degree of the experience is broad-based and demonstrates expertise in all proposed key technology areas, in design and build (if applicable to the applicant's proposed scope), and scale-up from bench testing to commercialization.

  The role of all organizations involved should be clearly defined. The MRC will assess if the core competency of the applicant (including the applicant's team) covers all project aspects, including but not limited to, feedstocks, engineering, conversion, NEPA and environmental permitting and siting, process development, financial, operations and maintenance, and product marketing.

  The applicant must include an overview of key facilities it will make use of in the conduct of the proposed project.

  Address the qualifications of the team undertaking the work, including an explanation of the following.

  - Experience with feedstock and feedstock source management - Describe in detail:
    - the level of experience in sustainably growing, harvesting, transporting, handling and storing large volumes (100 dry metric tonnes per day or more) of biomass feedstocks specifically destined for industrial processing. Or (less preferably from an MRC rating standpoint), if the applicant or applicant's partner organization(s) does not currently have this experience, a plan should be presented for obtaining a partner with the required experience in this area.
    - document pertinent supplier/applicant experience, provide detail on relevant experience in handling the specific, proposed biomass feedstock.

- Experience in operating similarly sized operations, including the ability to establish data quality objectives, analyze data, manage excursions from normal operations, and troubleshoot problems. Expertise in design/ build and scale-up. As applicable, provide evidence of commercial-scale experience in all proposed key technology areas, including solids handling, solids separation, fermentation, chemical catalysis, purification of products, bioengineering, thermochemical processing, etc.
    - Experience ensuring good team alignment, good communication, and conscious awareness of the importance of building good teams

    - Experience managing communications pathways within the team and between the team and outside entities, such as utilities, suppliers, fabricators, end-users, customers, DOE, etc.

- Demonstrate senior management buy-in to the planned commercialization and deployment. The method used to demonstrate this requirement is at the discretion of the applicant. Merely having a senior manager sign the application will not be considered as having met the sub-criterion.

    Rating Discussion: Applicants that fail to demonstrate that the senior management in the key applicant organization(s) is fully cognizant of the application and plans will be considered to have a significant weakness and may be considered non-responsive.

CRITERION 3

To address this criterion, the application must include a preliminary PMP that covers the scope of the project proposed in response to the FOA. The PMP must be in sufficient detail to permit the reviewers to assess the quality, completeness, and likelihood of successfully completing the project proposed in response to the FOA. The PMP does NOT need to be written to include any activities beyond the project, such as the work involved with commercialization and deployment.

In responding to criterion 3, the application must discuss the project management techniques, methods, and practices the applicant will use to manage the proposed project for the FOA. As with the other criteria, the MRC may consider other application documents as well as the PMP in determining the ratings for this criterion.

Your attention is directed to the weighting (percent of the score) of this criterion which indicates the importance DOE places on the quality and completeness of the PMP, even with the recognition that it is of a preliminary nature and will need to be expanded.

Project Management Plan

The PMP must include all of the activities that are planned to be completed within the scope of the proposed project, including the shakedown period, through commissioning, and operations through the completion of the award including the reporting and document submittal requirements during award/budget period 3.

Note: Due to the complexity and size of the proposed projects and the need to establish and maintain its required project oversight responsibilities, to the extent practicable and allowable, DOE will implement DOE project management policies, guidance and manuals, such as DOE Order 413.1A, Project Management System, DOE M 413.3-1, Project Management for the Acquisition of Capital Assets, and updates or supplements to these documents.

The requirements and guidance stated in the FOA (including its attachments) should guide the preparation of the applications to the FOA. Applicants are **NOT** required to review the information in the DOE documents, but they may wish to familiarize themselves with any of the topics covered. The guidance documents may be accessed at http://management.energy.gov/policy_guidance/project_management.htm . Many of the requirements in the documents will not be applicable to projects under this FOA. DOE's assigned Project Manager and Contracting Officer will work with each project (after selection) to "tailor" the requirements to each individual project depending on complexity, cost, and other factors.

Projects selected under the FOA will be required to establish and to maintain a PMP, other project management documents, and to establish project management and control systems as a condition to receiving an award and during the award. Some of the documents and systems will be required to use a DOE-mandated format; some have minimum requirements for content and quality; and for some, the format and quality are not established by DOE. To facilitate the merit review process and to facilitate selected projects getting under award, the content of the criteria in the FOA parallels the requirements that the applicants will be responsible for meeting if selected for negotiation of an award.

The PMP must contain, at a minimum, a description of the elements listed below as they are already implemented by the applicant. If the applicant has not currently implemented the following, the PMP must describe each action the applicant plans to implement and by when. Note that for scoring purposes, applications that provide a summary description of the currently employed systems and procedures (or those of a partner that will be adopted) will typically score higher than those that provide an overview of systems and procedures that will be established if the project is selected for negotiation of an award. Applications that merely state the systems and process will be developed when needed and those that do not address them at all will be considered to have a significant weakness or may be determined to be non-responsive.

- Earned Value Management System (EVMS). Planned project management tools, including Gantt charts, resource based scheduling, or other methods to assess progress and track progress. These would include methods to assess actual cost and schedule versus planned cost and schedule.

- Invoicing system based on the Code of Accounts and directly linked to the WBS and EVMS. (The Recipient's invoicing during the majority of the project and especially in award/budget period 2 will be based on payment by milestone or earned value for reimbursement of expenses.)

- Risk management plan (RMP) summary and a summary of the applicant's contingency planning that encompasses all types of risk, including financial, technical, and environmental. The RMP summary should describe the project's risk management process, methodology, risk analysis results, and mitigation planning. Describe how risks will be identified, ranked, and managed throughout the life of the project. RMPs may include the following categories, representing (typically) sequential risk management steps:
    - Risk identification
    - Risk impact analysis and quantification including the potential effect of environmental and other regulatory requirements on the project
    - Risk mitigation strategies development
    - Risk monitoring
    - Risk documentation.

  Specifically include a discussion as to how the applicant will accomplish post mechanical completion if piloting/demonstration identifies the need for substantial fix-ups, debottlenecking, etc. Provide plans to address additional costs and schedule delays. Discuss how additional resources will be secured to ensure that the original goals of the project are met.

  Rating Discussion: Applications that do not include a description of a mature risk management program and that fail to clearly identify the key risks and mitigation planning for the proposed project will likely score lower than those that do. An application that lists, acknowledges, and realistically discusses key risks and mitigation related directly to the proposed project will score higher than one that does not.

- Provide a summary of each of the following:
    - acquisition plan
    - procurement strategy
    - staffing plan including identification of costs and resources required to design, engineer, construct and operate
    - Preliminary Process Hazards Analysis (PHA) summary that incorporates the health and safety requirements into the design specifications and documents the effects of these requirements on the cost estimate
    - description of a stage gate process to execute the project.
    - contracting strategy including a description of the selection process for an engineering, procurement, and construction (EPC) firm, if one will be used for the project.

- A change control and configuration control management plan summary. This should include a summary of the plan that addresses how the team will handle design changes during construction, startup issues and potential walk-away criteria. Please include in your description how potential changes will be evaluated and authorized.

- A communications plan summary, including an overview of the mode and frequency of communications between all internal and external stakeholders. Describe how

communications will be documented and followed up.

- The key functions should be provided for in the project team along with the assignment and understanding of roles and responsibilities. This information should conform to what is presented in the applicant's experience and capability discussion in the Business and Commercialization Plan.

3. Units to be employed throughout the application:

Value or Measure	Metric Units	English Units
Yields	kg or L/tonne feedstock supplied	lb or gal/ton feedstock supplied
Process Conversion Yields	Percent of theoretical yield (actual yield/theoretical yield)	
Throughput volumes	L or kg/hr	Gallons or lbs/hr
Product concentrations	kg or g/L	lb or lb/gal
Weight percentages	wt/wt	
Electricity	kW	
Energy use	kW/dry tonne product or kW/L product (at specific concentration, if applicable)	kW/dry ton product or kW/gal product (at a specific concentration, if applicable)
Overall plant biofuel capacity	L per annum	Gallons per annum
Overall plant product capacity (other than fuel)	L or kg/dry ton feedstock/annum	Gallons or lb/dry ton feedstock/annum
Overall plant capacity or use for heat or power	Million Btu/dry tonne of feedstock or kWh/dry tonne feedstock per annum	Million Btu/dry ton of feedstock or kWh/dry ton feedstock per annum
Emissions outputs	kg/kg product produced	lb/lb product produced
Capital and equipment costs	Designate as purchased, installed or total investment (with indirect costs included). Employ a 2005 year cost basis	
Life cycle assessment or analysis information	Reduction in fossil energy usage (see units above) or reduction in emissions from use of biomass (see units above)	

APPENDIX E - National Environmental Policy Act (NEPA) Submittal Requirements and Guidance

This attachment consists of two parts. Part 1 is an overview of the general process that DOE uses to comply with the National Environmental Policy Act (NEPA). Part 2 provides guidance for the applicants to FOA DE-PS36-09GO99038.

1. OVERVIEW OF DOE'S NEPA PROCESS

All proposed actions that involve U.S. government decisions or resources must be evaluated to determine how environmental impact review requirements apply. All new projects must be analyzed to determine if environmental, siting, or other issues must be addressed.

Applicants should carefully consider and should seek legal counsel or other expert advice before taking any action related to the proposed project which would have an adverse affect on the environment or limit the choice of reasonable alternatives prior to DOE providing either a NEPA clearance or a final NEPA decision regarding the project.

If an applicant moves forward with activities that are not authorized for federal funding by the DOE Contracting Officer in advance of the final NEPA decision, they are doing so at risk of not receiving federal funding and such costs may not be recognized as allowable cost share.

1.1 Environmental Impact Assessment

Environmental impact analyses for federal project requirements are set forth in NEPA. Reviews are required for virtually all proposed DOE financial assistance projects or actions and for changes in existing activities or operations to determine their environmental impacts. The depth of review required varies with a project's environmental impact sensitivity. All reviews require the collection and analysis of data about the project. For some, the information is readily available or obtainable. For others, it might take over a year of effort.

1.2. Regulatory Summary of the National Environmental Policy Act (NEPA)

Under NEPA, all "major federal actions" or projects affecting the quality of human health and the environment must be reviewed to evaluate their environmental effects and to identify project alternatives. Subsequent to enactment of NEPA, the Council on Environmental Quality (CEQ) was established. The CEQ prepared regulations requiring each federal agency to prepare specific procedures for implementing NEPA. DOE's procedures require different levels of environmental documentation depending on the potential severity of impacts as well as on other factors. This NEPA review process must be completed before final decisions are made by DOE officials to begin the project or action, or before irretrievably committing substantial federal resources. Limited Federal funds may be available or cost share may be allowed to cover some costs associated with conducting the NEPA review.

Under DOE's implementing regulations, NEPA review requirements apply to **all proposed actions**, not only those that are considered "major" federal actions with potentially significant impacts. The process must begin as early as possible in the project planning cycle since the review must be completed by DOE before beginning final design (on certain construction

projects), before committing resources, or before actually starting the award or project activities on non-construction projects.

1.3 Environmental Impact Review Process

The environmental impact review process begins when there is a proposed federal action, project, or proposal having the potential to affect the environment. Because DOE is a federal agency, its actions are subject to the requirements of NEPA. DOE NEPA review procedures also apply to proposed actions that involve DOE-funded staff, equipment, or operations at offsite (non-DOE) facilities or locations (e.g., Work-for-Others (WFO) projects and Cooperative R&D Agreements [CRADAs]). NEPA applies worldwide, because the requirement for compliance is related to the agency regardless of the location of the actual project.

Scheme 1 illustrates a simplified version of the process to determine the appropriate level of NEPA review or documentation needed to receive Federal funds.

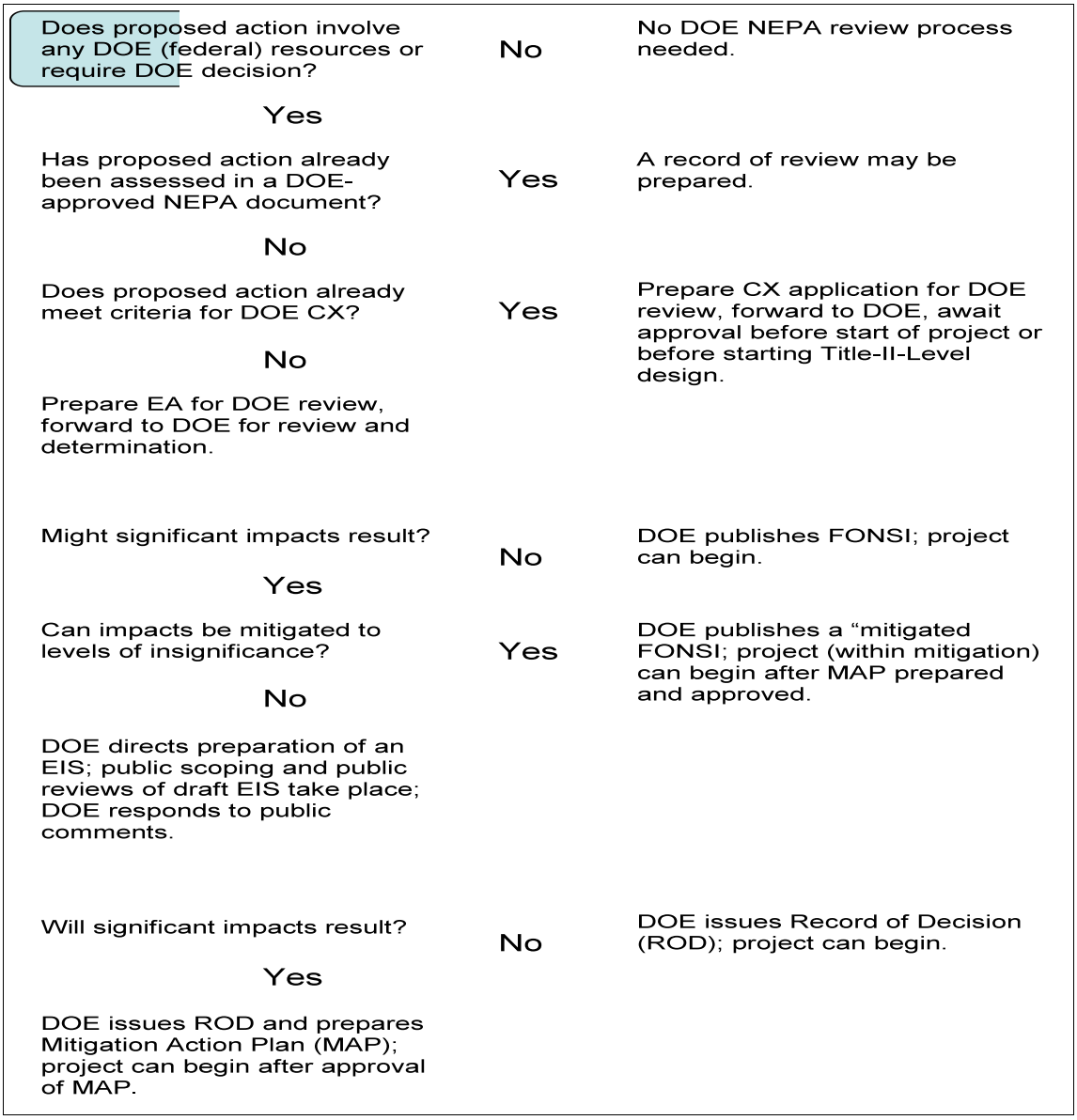
Decisions as to whether the NEPA review process is adequate rest with DOE; and DOE cannot delegate the authority to make NEPA determinations to contractors or to the grantees.

"Project funds" may be DOE funds, cost share funds, or a combination of both. For projects selected for negotiation of an award, the NEPA information must be provided for each location at which activities will be done under this project including support facilities, such as laboratories, test plot locations, fields, feedstock sources, and so forth.

NEPA documentation prepared for the project by another federal or state agency may be adopted by DOE in full or in part to satisfy the requirements. If the impacts of a proposed project are not already assessed in a previously DOE-approved NEPA document, a separate review is conducted.

For a number of DOE-defined (and publicly reviewed) classes of actions, there exist Categorical Exclusions (CXs). Proposed projects must meet a series of DOE eligibility criteria to be Categorically Excluded from additional detailed NEPA review. The DOE NEPA Compliance Officer reviews projects to determine if they are eligible for a CX. The DOE NEPA regulations list many categories of projects that qualify for CXs. By definition, a CX applies to activities that do not individually or cumulatively have a significant effect on the environment. For example, most routine maintenance projects, such as resurfacing parking lots, qualify for a Categorical Exclusion. A CX document includes a brief description of the project and its effects, if any, on the environment. Additional available environmental information can be used to support the CX documentation.

Scheme 1. Simplified DOE NEPA screening and review process



An Environmental Assessment (EA) is required when there is uncertainty whether significant environmental impact(s) will occur from a project. An EA is a short, concise document based primarily on existing information. After evaluation by the DOE, an EA will result in either a Finding of No Significant Impact (FONSI), which means that the proposed action may proceed, or the EA will require that a more detailed document called an Environmental Impact Statement (EIS) be prepared. A FONSI is issued if DOE finds that the project's impacts will be insignificant or that the impacts can be mitigated so as to become insignificant. If certain measures need to be implemented to help mitigate environmentally significant impacts of the project, a DOE Mitigation Action Plan (MAP) will be prepared and implemented.

DOE will direct the preparation of an EIS if the potential impacts are significant or cannot be mitigated. The EIS preparation and review process involves substantial public input and review and culminates in a Record of Decision (ROD) by the Secretary of Energy. If certain measures need to be implemented to help mitigate environmentally significant impacts of the project, a DOE Mitigation Action Plan (MAP) will be prepared and implemented. DOE may also direct preparation of an EIS on certain types of proposed projects simply on the basis of their scope, type, or public controversy.

The following is a list of the average times and estimated costs necessary to complete the DOE review and approval of NEPA documentation:

CX - 6 weeks	$2,000-50,000
EA - 6 to 12 months	$20,000-100,000
EIS - 18 to 24 months	$500,000-1,500,000

Note: The cost estimates include expenses related to data collection and analysis and also document preparation. However, site and process specific factors can substantially impact the costs and durations.

1.4 NEPA Document Preparation

Each applicant to the FOA must provide initial NEPA information for review during the selection process. Then, those applicants selected for negotiation of an award must provide an updated and expanded description of projected environmental consequences specific to the proposed project as well as mitigation measures to reduce its impacts. These descriptions will be incorporated into the appropriate level of NEPA document before decisions are made and actions are taken that could impact the quality of the environment. Receiving DOE funding for an award is contingent upon the final NEPA determination.

Before taking an irreversible or irretrievable action, the applicant must provide enough information to enable DOE to determine the level of review required under NEPA, to support preparation of the NEPA document, and obtain the final NEPA determination.

DOE anticipates many of the IBR projects will require the preparation of an environmental assessment ("EA") or environmental impact statement ("EIS"), which will be considered as part of DOE's decision-making concerning the applications. However, Projects that involve existing facilities or where construction would have minimal, well-identified impacts could be categorically excluded (CX'd).

In cases where an EA or an EIS is required for a project, DOE will arrange for its preparation by executing a Memorandum of Understanding between the recipient, an independent, qualified third party, and DOE for its preparation, or, if available, DOE may choose to adopt one prepared by another federal agency (e.g., U.S. Department of the Interior).

1.5 Post-selection for Negotiation of Award NEPA Process Details

The following outlines the DOE NEPA process that follows the notification of selection. After the initial award (prior to the decision to do final design and construction), the selected applicants will be asked to submit NEPA information for all locations at which work will be

done under the proposed project. After being notified of being selected for negotiation of an award, the selected applicants will be instructed to provide further NEPA information, building on the information submitted in the application and information on additional locations provided after initial award. The NEPA compliance staff and the DOE project management team will work with the applicant to identify the additional information required. The preparation process for projects subject to a CX, EA, and EIS are summarized below.

After the NEPA information is submitted and is initially determined by the DOE project team to be complete, the DOE Project Officer (PO) will prepare a recommendation to the DOE NEPA Compliance Officer (NCO) as to the level of NEPA documentation required. The NCO takes the PO's recommendation into consideration, conducts a separate, independent review of the information and takes one of 4 actions:

1. Returns the recommendation with a request for additional information.
2. Determines that a CX is the appropriate level of documentation.
3. Determines that an EA is the appropriate level of documentation.
4. Determines that an EIS is the appropriate level of documentation.

Preparation of a CX

If the NCO determines a CX should be issued, the NCO drafts the CX and notifies the PO, who in turn notifies the applicant. Unless the project scope changes, no further NEPA documentation is required from the applicant. The CX will be included as a part of the formal award, and the awardee is responsible for monitoring the project to ensure that the scope remains within the activities described in the CX.

After award, in the event the scope will expand beyond the approved activities, the awardee must notify DOE in advance and may be required to submit additional information on the scope and its impacts. If DOE determines that no action is necessary, the awardee will be notified. However, in the event DOE determines that a revision to an existing NEPA document or preparation of a new NEPA document is required, the awardee will not be allowed to proceed with the new scope until after a final NEPA decision has been made.

Preparation of an EA

If DOE determines an EA should be issued, the DOE NEPA and project staff will work with the applicant to identify the scope of the project and to mutually agree on the project description. DOE may, as appropriate, adopt an EA or EIS prepared by another federal agency (e.g., U.S. Department of the Interior) for the corresponding project. The applicant is responsible for obtaining the required information and for incorporating it into a format that is acceptable to DOE. (See the section "Selection of a NEPA Contractor" below.). After DOE and the applicant finalize the project description and the scope of the analysis to be completed, DOE will invite the public to comment on the adequacy of the scope of analysis and offer additional information for consideration in the EA. The public scoping period is generally open for 30 days, or longer if there is a high likelihood of public controversy about the proposed project.

Following completion of the draft EA and any public notifications required by DOE, the NCO drafts a FONSI or determines that an EIS is required. The NCO or the PO will notify

the applicant. If a FONSI is issued, unless the project scope changes, no further NEPA documentation is required from the applicant. At the discretion of the NCO, the applicant may also be required to complete a MAP either in parallel with the issuance of the EA and FONSI. The fact that the EA was completed will be included as a part of the formal award, and the awardee is responsible for monitoring the project to ensure that the scope remains within the activities described in the EA.

After award, in the event the scope will expand beyond the approved activities, the awardee must notify DOE in advance and may be required to submit additional information on the new activity and its impacts. If DOE determines that no action is necessary, the awardee will be notified. However, in the event DOE determines that a revision to an existing NEPA document or preparation of a new NEPA document is required, the awardee will not be allowed to proceed with the new activity until after a final NEPA decision has been made.

Preparation of an EIS

If DOE determines that an EIS is required, DOE will prepare the EIS, or, as appropriate, adopt an EIS prepared by another federal agency (e.g., U.S. Department of the Interior) for the corresponding project. If DOE needs to prepare an EIS, DOE will publish in the Federal Register a notice of intent ("NOI") to prepare the EIS. The NOI states the purpose and need for agency action, opens a minimum 30-day scoping process, and provides preliminary information on the proposed EIS scope, including the alternative actions to be evaluated and the kinds of potential environmental impacts to be analyzed in the EIS. During the 30-day scoping process, DOE will hold one or more public meetings in the vicinity of the proposed project site. DOE officials will attend and conduct the meeting(s). An EIS preparation contractor may be called upon to facilitate the logistics of the meeting.

During the public scoping process DOE requests comments from the public on the scope of the EIS in regards to the range of alternatives that should be evaluated and what potential environmental impacts should be analyzed. DOE then considers scoping comments and prepares a draft EIS ("DEIS"), which will, at a minimum, meet the requirements in the Council on Environmental Quality's ("CEQ") NEPA regulations at 40 CFR Parts 1500-1508 and DOE NEPA regulations at 10 CFR Part 1021. The DEIS is distributed to members of Congress, other federal agencies, Indian tribes, state and local governments and organizations and individuals known to be potentially affected or have an interest in the project and is filed with the U.S. Environmental Protection Agency (EPA). EPA then publishes a notice of availability ("NOA") in the Federal Register announcing the availability of the DEIS beginning a minimum 45-day public comment period. DOE may publish its own NOA describing how the public may comment, including the location and schedule of one or more public hearings on the DEIS.

After receiving comments, a final EIS ("FEIS") is prepared that includes public comments on the draft EIS and DOE responses describing how the comments were addressed in the FEIS. The same distribution process as the DEIS follows, including a filing with EPA. EPA issues a NOA in the Federal Register, and DOE may issue a record of decision ("ROD") no sooner than 30 days after publication of the NOA. The ROD describes the agency's decision regarding the proposed action and is published in the Federal Register.

Selection of a NEPA Contractor

DOE may choose to use a third-party contract arrangement to assist DOE in the preparation of an EA or EIS. The environmental firm preparing the EA or EIS will work exclusively under the direction of DOE. DOE will be solely responsible for the contents of the EA or EIS. For the preparation of an EA, the applicant may propose an environmental firm to DOE, and DOE will approve or not approve the proposed contractor. Information on firms that hold DOE-wide NEPA indefinite delivery/indefinite quantity contracts is available on the DOE NEPA website at http://www.eh.doe.gov/NEPA, under "DOE-wide NEPA Contracting." However, all qualified firms will be considered by DOE. The applicant will hire a firm to prepare the EA, once a third-party agreement or memorandum of understanding ("MOU") has been signed by DOE, the environmental firm, and the applicant. The selected firm must sign a conflict of interest form indicating that it has no financial or other interest in the outcome of the project. DOE will not be involved in the fee and contractual negotiations between the applicant and the NEPA contractor. For the preparation of an EIS, DOE is solely responsible for competitively selecting and contracting with an environmental firm.

2. INFORMATION TO BE SUBMITTED TO DOE IN THE FOA APPLICATION

Each applicant must submit a completed Environmental Questionnaire as a part of the application. The applicant must also ensure that the risks and potential impacts are analyzed and discussed in the applicant's PEP, Business and Commercialization Plan, and the Project Management Plan.

The Environmental Questionnaire submitted with the application will be used to provide the Merit Review Committee (MRC) and DOE with a summary of the information and status of the project with regard to NEPA and other environmental and siting requirements. The information should be based on current federal, state and local requirements applicable to the proposed site and schedule, throughput and production rate(s) of the primary product and any major co-products for the proposed biorefinery. If known changes to the requirements are likely to be in effect during the award period, they should be considered and included.

DOE will use all available NEPA related information for the actual NEPA determination, including information collected in the applications as well as information requested from applicants after selection and during the negotiation for award.

The MRC will assess the applicant's understanding of NEPA, environmental permitting, siting, and related topics. The MRC will use the information to assess the e potential risks and impacts to the proposed project. It is understood that the applicants will likely not have all of the information required to make a NEPA determination at the time the application is submitted. Each application should include the information that indicates to DOE and the MRC that the applicant has completed an analysis of the potential environmental impacts of each major facility included in the proposed project.

Regardless of the amount of information the applicant has available, the application should demonstrate the depth and degree to which the applicant understands the NEPA process. It should clearly show the applicant has analyzed and understands the risks (scope, schedule and

budget, and site selection) associated with each level of NEPA documentation (CX, EA, EIS), and the applicant has or will have the systems and processes fully implemented to comply with all applicable environmental requirements. It is strongly recommended that the applicant include in their Risk Management Plan the level of NEPA documentation likely to apply and then consider the impacts if the level is determined to be higher or lower. Risk mitigation for the range should be incorporated into the application.

Projects selected for negotiation of an award will be required to submit NEPA information for each location at which activities will be done under this project. For the purpose of applying to the FOA, the NEPA information should be provided for the primary location(s) at which work would be done. NEPA information for locations such as the following is not required to be included in the application, but the applicant may include it at their discretion: routine laboratory, document research, and routine crop growing or feedstock collection. If construction or significant activities will occur at more than one location, the information for those locations should also be included. For example, if a new pilot plant will be built (or an existing one modified) at one location, and research involving field cultivation of genetically modified organisms is occurring at another, information on both should be included in the Environmental Questionnaire. If applicable, requirements such as release and transportation of the GMOs and compliance methods to be used should be specifically identified and summarized

> *Rating examples* – Scores will be based on the how well the application demonstrates knowledge of all permitting processes and regulation requirements and their potential impacts. Failure to address the permitting and regulatory process will be considered non-responsive. A timeline justified by experience would rate higher consideration than a timeline based simply on estimates.

The Environmental Questionnaire upload and access information is in section IV.C.j of the FOA. This guidance covers what should be included in the Environmental Questionnaire narrative, and it is not meant to replace or restrict the information required in the Environmental Questionnaire.

Note 1: The submitted information should contain data and analysis reasonably available to the applicant at the time of preparing the application.

Note 2: Some of the information required will already be included in other parts of the application, such as the PEP. If the applicant wishes, the information can be summarized in the Environmental Questionnaire and the location of the detailed information can be referenced, but ensure the references are accurate and detailed to aid the MRC in finding the information. A reference, such as “See the discussion on GMOs in the PEP,” is too broad and should be refined to state the subsection or page number .

Note 3: Applicants are reminded that compliance with all federal, state and local environmental and siting requirements is important. One area of concern applicants are asked to be especially mindful of relates to proposed projects that will use genetically modified plant and animal materials including microbial organisms. The applications must include a description of the compliance and schedule impacts as they apply to the requirements for the use, transportation,

release, management and control of genetically modified organisms.

U.S. authorities regulate bioengineered products based on a determination of their safety to humans and the environment. Federal, state and local requirements may apply depending on location. The primary federal agencies are:

- USDA / Animal Plant Health Inspection Service (APHIS)
- Environmental Protection Agency (EPA)

Depending on the properties and intended use of a bioengineered genetically modified organism or product, one or both of these agencies is responsible for regulation or approval, and state and local requirements can parallel, be more restrictive, or cover a broader range of organisms. Along with the other compliance requirements, these regulations should be carefully researched and must be fully disclosed in the Environmental Questionnaire.

Typical Information Required in the Narrative Section of the Environmental Questionnaire

1. Facilities – describe and, as appropriate, identify and quantify:
   - new facilities to be constructed, existing facilities to be modified, and materials and equipment to be used in construction;
   - size of the new and modified facilities and of the total project site (including support facilities needed, such as parking lots and treatment facilities, and associated land uses, such as agricultural production areas);
   - extent of necessary site clearing and excavation;
   - associated construction of transport infrastructure (e.g., access roads, railroad links, docks, pipelines, electrical transmission facilities)
   - waste treatment facilities;
   - any existing facility that is part of, or related to, the proposed project.

2. Project Location – describe and, as appropriate, identify, quantify, or provide a map:
   - project site and location;
   - ownership of or jurisdiction over the land by Federal, state, regional, or local agency;
   - existing transportation corridors and infrastructure;
   - nearby land use and features (e.g., residences, industrial facilities, parks, surface water, soils, geology, hydrology);
   - areas with special designation both on the project location and nearby (e.g., National Forests, National Historic Properties, wetlands, floodplains, critical habitat for designated threatened or endangered species ambient air quality; and near-by populations (including minority and low-income)).

3. Proposed Project Construction and Operation –

   (a) describe and, as appropriate, identify and quantify project operations, including:
      - material resources to be used, including how they would be transported;
      - source(s) and rates of water consumption and adequacy of water supply sources;
      - materials produced, including how they would be transported;
      - onsite and offsite releases (air emissions, including carbon dioxide, odors;
      - water effluents,

- solid and other liquid waste streams), including rate and duration of such substances as criteria pollutants, greenhouse gases, and hazardous substances;
- onsite and offsite waste treatment and disposal;
- number of on-site workers;
- any mitigating measure(s) to be used or considered to be used to reduce environmental impacts, such as secondary containment for above- and below-ground tanks and ancillary equipment, spill control and countermeasure plans, a fully implemented health, safety and environment compliance program that includes periodic, required training for all employees.

(b) present an overall schematic process diagram that identifies all inputs and outputs; and

(c) identify a spectrum of scenarios that could result from process upsets, startup, shut down, human error, and accidents/intentional destructive acts.

4. Project progression – provide information on:
- construction milestones;
- expected operating cycle and any aspects of the project that could result in impacts that vary over time (e.g., with time of day or season of the year); and
- expected project lifetime, including expansion of initial project at the proposed site and to other sites.

5. Status of environmental and regulatory reviews, including permitting
- if the proposed project would require review or permitting by another Federal agency or by a state, regional, or local agency, identify the required reviews and permits and tell the status of each; and
- if an environmental impact review (e.g. NEPA documentation, agency consultations) has been prepared (or is in the process of being prepared or is anticipated) for the proposed project (by another federal agency or a state agency), provide a summary or copy of the review.

6. Alternative sites or operating parameters:
- identify any other sites considered for the proposed project, and state whether they remain options or give the reasons for not proposing them;
- identify any alternative operating parameters for the proposed project (e.g., materials to be used in constructing and operating the project, emissions controls or carbon sequestration) and state whether they remain options or give the reasons for not proposing them; and
- identify other major project options, if any, relevant to environmental concerns.

7. Post-operational requirements – to the extent possible:
- describe any reasonably foreseeable future requirements, including site close-out and site restoration;
- describe any related decontamination and decommissioning activities, including associated waste streams; and
- identify the source of resources that will be employed to complete the above activities.

8. Other actions in the project area:

- describe current or other possible future industrial or other facilities and activities (for example, coal-fired electrical plants or biomass facilities), including those by other companies, in the same geographic area(s).

Applicants may wish to also review NEPA references on DOE's website at http://www.eh.doe.gov/NEPA/guid_tools.html -- "Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements," "Environmental Impact Statement Checklist," and the "Environmental Assessment Checklist". Reviewing existing EAs and EISs published on DOE's website will facilitate understanding the level of analysis that DOE will need to carry out in its NEPA review should the applicant be selected for negotiation of an award.

Appendix F – Personally Identifiable Information

In responding to this Announcement, Applicants must ensure that Protected Personally Identifiable Information (PII) is not included in the following documents: Project Abstract, Project Narrative, Project Execution Plan, Biographical Sketches, Budget or Budget Justification. These documents will be used by the Merit Review Committee in the review process to evaluate each application. PII is defined by the Office of Management and Budget (OMB) and DOE as:

> Any information about an individual maintained by an agency, including but not limited to, education, financial transactions, medical history, and criminal or employment history and information that can be used to distinguish or trace an individual's identity, such as their name, social security number, date and place of birth, mother's maiden name, biometric records, etc., including any other personal information that is linked or linkable to an individual.

This definition of PII can be further defined as: (1) Public PII and (2) Protected PII.

1. **Public PII:** PII found in public sources such as telephone books, public websites, business cards, university listing, etc. Public PII includes first and last name, address, work telephone number, email address, home telephone number, and general education credentials.

2. **Protected PII:** PII that requires enhanced protection. This information includes data that if compromised could cause harm to an individual such as identity theft.

Listed below are examples of Protected PII that Applicants must **not** include in the files listed above to be evaluated by the Merit Review Committee.

- Social Security Numbers in any form
- Place of Birth associated with an individual
- Date of Birth associated with an individual
- Mother's maiden name associated with an individual
- Biometric record associated with an individual
- Fingerprint
- Iris scan
- DNA
- Medical history information associated with an individual
- Medical conditions, including history of disease
- Metric information, e.g. weight, height, blood pressure
- Criminal history associated with an individual
- Employment history and other employment information associated with an individual
- Ratings
- Disciplinary actions
- Performance elements and standards (or work expectations) are PII when they are so intertwined with performance appraisals that their disclosure would reveal an individual's performance appraisal

- Financial information associated with an individual
- Credit card numbers
- Bank account numbers
- Security clearance history or related information (not including actual clearances held)

Listed below are examples of Public PII that Applicants **may** include in the files listed above to be evaluated by the Merit Review Committee:

- Phone numbers (work, home, cell)
- Street addresses (work and personal)
- Email addresses (work and personal)
- Digital pictures
- Medical information included in a health or safety report
- Employment information that is not PII even when associated with a name
- Resumes, unless they include a Social Security Number
- Present and past position titles and occupational series
- Present and past grades
- Present and past annual salary rates (including performance awards or bonuses, incentive awards, merit pay amount, Meritorious or Distinguished Executive Ranks, and allowances and differentials)
- Present and past duty stations and organization of assignment (includes room and phone numbers, organization designations, work email address, or other identifying information regarding buildings, room numbers, or places of employment)
- Position descriptions, identification of job elements, and those performance standards (but not actual performance appraisals) that the release of which would not interfere with law enforcement programs or severely inhibit agency effectiveness
- Security clearances held
- Written biographies (e.g. to be used in a program describing a speaker)
- Academic credentials
- Schools attended
- Major or area of study
- Personal information stored by individuals about themselves on their assigned workstation or laptop unless it contains a Social Security Number

Appendix G - Typical Award Structure

This section provides additional clarification on the award structure that is described in Part II of the FOA. Table 1 shows: 1) the likely structure of the awards that will result from the FOA, and 2) the key completion requirements for each award/budget period. Each project will likely have 3 awards or 3 budget periods, and the transition from one award/budget period to the next is contingent upon DOE's decision on go/no go criteria based on performance metrics and other factors that will be identified in each award/budget period. Projects that use a Technology Investment Agreement (TIA) will likely have very similar phases and completion requirements to the three described here. Examples of the factors include:

- obtaining the DOE NEPA determination and approval;
- implementation of any NEPA mitigation action plan requirements;
- successful completion of stage gates;
- establishing and maintaining a comprehensive risk management plan; and
- the applicant meeting terms and conditions (such as obtaining adequate contingency funds, demonstrating financial backing, or technical requirements).

Table G-1: Typical award structure.

Award/Budget Period	Purpose/Outcome	Typical Completion Requirements (Actual completion requirements will be negotiated)
1	1) Prepare, complete and submit the application for award/budget period 2. Complete NEPA data collection and documentation. Continue design. Expand and update the Risk Management Plan for DOE approval. 2) For all topic areas, the FOA states that "typically" up to 10% of the total project cost may be used for doing preparatory work to support the design of the project, if the applicant describes and justifies the basis and direct applicability of the scope and budget. Based on direction from the Selection Official, DOE may elect to increase or decrease the requested funding for preparatory R&D during negotiations that occur after	1) Successful completion of award/budget period 1 activities and milestones as agreed upon and detailed in the negotiated award. 2) The decision to proceed is based on the DOE NEPA determination and approval as well as legal, technical and financial readiness factors.

	notification of selection. 3) The scope, deliverables, and budget will vary depending on the state of readiness of each project.	
2	1) Complete construction or modification to existing facilities including shakedown and the IE performance test. Typically this will require that the pilot or demonstration facility must operate in a continuous mode as intended for an agreed upon period of time prior to the IE performing the test. 2) After the IE Performance Test, the facility must operate for a negotiated number of cumulative run hours or for a specified number of months to allow obtaining technical and budget information. The actual completion criteria will be negotiated.	1) Interim Final Technical Report. 2) Completed cumulative run hours or a specified duration after DOE accepts the IE performance test report.
3	1) The awardee may continue to conduct post-construction piloting or demonstration at its own expense. 2) The DOE project scope will be reduced to the awardee collecting and analyzing data and generating information for input into DOE's State of Technology reports. At the end of the project, the awardee will submit the closeout documents including the final pro forma, final IP report, property and supplies disposition, and the final technical report. 3) Award/budget period 3 will typically be for up to 5 years, but	1) Completed cumulative run hours, if any, as agreed upon and detailed in the negotiated award. Pilot facilities (Topic Areas 1, 2, or 5) will typically not be expected to run as long as the demonstration facilities (Topic Areas 3, 4, or 6). The negotiated length of time will be commensurate with the quantity and quality of data needed for the project to progress to the next developmental phase, budget, and other factors. 2) DOE accepts the final pro forma and the Final Technical Report as scheduled in the award. The Final Technical Report would contain: a) a

	will be negotiated to accommodate each project's schedule and objectives, so it could be for substantially less time.	summary of the project including specifics on how it performed against its goals and critical success factors; b) preliminary process flow diagrams, and mass and energy balances for a facility at the next level of scale up.

Appendix H – Budget Justification Guidance

Using the "Object Class Categories" in the SF-424A, justify the costs in each category for each budget period of the project. A budget justification is required for the applicant. A separate SF 424A and budget justification is required for each subawardee/sub-recipient having a budget over $100,000. All charges, Federal and cost share, must be justified. The totals in each category and also the Total Project Cost should match between the budget justification and SF 424Abudget. A spreadsheet or other tabular format is recommended.

Personnel

List costs solely for employees of the entity completing this form (award recipient or sub-recipient). All other personnel costs (of subrecipients or other contractual efforts of the entity preparing this) must be included under "Contractual." This includes all consultants and FFRDCs.

Identify positions to be supported. Key personnel should be identified by title. All other personnel should be identified either by title or a group category. State the amounts of time (e.g., hours or % of time) to be expended, the composite base pay rate, total direct personnel compensation and identify the rate basis (e.g., actual salary, labor distribution report, technical estimate, state civil service rates, etc.). Identify the number of employees (on a Full Time Equivalent) that will be employed in each position or group category.

Note the prevailing wage requirements in the ARRA (P.L. 111-5).

Task # and Title	Position Title	Budget Period 1			Budget Period 2			Budget Period 3			Project Total Hours	Project Total Dollars	Rate Basis
		Time (Hours)	Pay Rate ($/Hr)	Total Budget Period 1	Time (Hours)	Pay Rate ($/Hr)	Total Budget Period 2	Time (Hours)	Pay Rate ($/Hr)	Total Budget Period 3			
1. Generation 2A Reactor Design		10000		$423,000	600		$24,000	800		$31,000	11400	$478,000	Actual Salary
	Sr. Engineer (1)	2000	$85.00	$170,000	200	$50.00	$10,000	200	$50.00	$10,000	2400	$190,000	Actual Salary
	Process engineers (3)	6200	$35.00	$217,000	400	$35.00	$14,000	600	$35.00	$21,000	7200	$252,000	Actual Salary
	Technician (1)	1800	$20.00	$36,000	0	$0.00	$0	0	$0.00	$0	1800	$36,000	Actual Salary

Fringe

A federally approved fringe benefit rate agreement, or a proposed rate supported and agreed upon by DOE for estimating purposes is required if reimbursement for fringe benefits is requested. If a fringe benefit rate has been negotiated with, or approved by, a federal government agency, a copy of the latest rate agreement must be included with this application, and if selected, must be provided electronically to the Contracting Officer for this project. Please state if the rate agreement has already been provided to the Contracting Officer, OR if it has changed since it was. If there is not a current, federally approved rate agreement negotiated and available, provide a copy of the proposal with the application. If selected, the rate agreement will be finalized during award negotiations. Calculate the fringe rate and enter the total amount in Section B, line 6.b. ("Fringe Benefits") of form SF-424A.

	Budget Period 1	Budget Period 2	Budget Period 3	Total

Rate applied:	0.0%	0.0%	0.0%	
Total fringe requested:	$0	$0	$0	**$0**

Travel

Provide travel detail as requested below, identifying total Foreign and Domestic Travel as separate items. Purpose of travel are items such as professional conference, DOE sponsored meeting, project management meeting, etc. The Basis for Estimating Costs could be items such as past trips, current quotations, Federal Travel Regulations, etc. Identify number of travelers, estimated cost per traveler, and duration of trip.

All listed travel must be necessary for performance of the Statement of Project Objectives.

Note: All projects should budget for sending 1-2 travelers to a DOE project review during each year of the project, each review will take approximately 2-3 days.

Purpose of travel	No. of Travelers	Depart From	Destination	No. of Days	Cost per Traveler	Cost per Trip	Basis for Estimating Costs
Budget Period 1							
Domestic Travel							
Visit to reactor mfr. to set up vendor agreement	2	Denver CO	Dallas TX	2	$650	$1,300	Internet prices
Domestic Travel subtotal						$1,300	
International Travel							
Visit to technology provider to discuss IP agreement	2	Denver CO	Berlin Germany	5	$4,000	$8,000	Previous experience
International Travel subtotal						$8,000	
Budget Period 1 Total						**$9,300**	
(repeat as necessary for each Budget Period)							

Equipment

Equipment is generally defined as an item with an acquisition cost greater than $5,000 and a useful life expectancy of more than one year. Further definitions can be found in 10 CFR 600.

List all proposed equipment below, providing a basis of cost such as vendor quotes, catalog prices, prior invoices, etc., and briefly justifying its need as it applies to the Statement of Project Objectives. If it is existing equipment, and the value of its contribution to the project budget is being shown as cost share, provide logical support for the estimated value shown. If it is new equipment which will retain a useful life upon completion of the project, provide logical support for the estimated value shown.

For equipment over $50,000 in price, also include a copy of the associated vendor quote or catalog price list.

Equipment Item	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
Budget Period 1					
EXAMPLE ONLY!!! Thermal shock chamber	2	$20,000	$40,000	Vendor Quote	Reliability testing of PV modules- Task 4.3
Budget Period 1 Total			$40,000		

(repeat as necessary for each Budget Period)

Supplies
Supplies are generally defined as an item with an acquisition cost of $5,000 or less and a useful life expectancy of less than one year. Supplies are generally consumed during the project performance. Further definitions can be found in 10 CFR 600.

List all proposed supplies, providing a basis of cost such as vendor quotes, catalog prices, prior invoices, etc., and briefly justifying the need for the Supplies as they apply to the Statement of Project Objectives. Note that Supply items must be direct costs to the project at this budget category, and not duplicative of supply costs included in the indirect pool that is the basis of the indirect rate applied for this project.

General Category of Supplies	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
Budget Period 1					
EXAMPLE ONLY!!! Wireless DAS components	10	$360.00	$3,600	Catalog price	For Alpha prototype - Task 2.4
Budget Period 1 Total			$3,600		
(repeat as necessary for each Budget Period)					

Contractual
The applicant must provide and justify all costs related to sub-recipients, vendors, contractors, consultants and FFRDC partners.

Sub-recipients (partners, sub-awardees):
For each sub-recipient with total project costs greater than $100,000 or assigned to complete a major portion of the project, a separate SF-424A budget and budget justification form must be submitted. These sub-recipient forms may be completed by either the sub-recipients themselves or by the applicant. The budget totals on the sub-recipient's forms must match the contractual entries in the budget and budget justification of the applicant.

It is the responsibility of the applicant to ensure adequate support of the sub-recipient budget is included with the application. The support to justify the budgets of sub-recipients with estimated costs less than $100,000 may be in any format, and at a minimum should provide what Statement of Project Objectives task(s) are being performed, the purpose/need for the effort, and a basis of the estimated costs that is considered sufficient for DOE evaluation.

Vendors (includes contractors and consultants):
List all vendors, contractors and consultants supplying commercial supplies or services used to support the project. The support to justify vendor costs (in any amount) should provide the purpose for the products or services and a basis of the estimated costs that is considered sufficient for DOE evaluation.

Federal Research and Development Centers (FFRDCs):
For FFRDC partners, the applicant should provide a Field Work Proposal (if not already

provided with the original application), along with the FFRDC labor mix and hours, by category and FFRDC major purchases greater than $25,000, including Quantity, Unit Cost, Basis of Cost, and Justification.

Sub-Recipient Name/Organization	Purpose/Tasks in SOPO	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Project Total
EXAMPLE ONLY!!! XYZ Corp.	Partner to develop optimal fresnel lens for Gen 2 product - Task 2.4	$48,000	$32,000	$16,000	$96,000
	Sub-total	$48,000	$32,000	$16,000	$96,000
Vendor Name/Organization	Product or Service, Purpose/Need and Basis of Cost (Provide additional support at bottom of page as needed)	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Project Total
EXAMPLE ONLY!!! ABC Corp.	Vendor for developing custom robotics to perform lens inspection, alignment, and placement (Task 4). Required for expanding CPV module mfg. capacity. Cost is from competitive quotes.	$32,900	$86,500		$119,400
	Sub-total	$32,900	$86,500	$0	$119,400
FFRDC Name/Organization	Purpose	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Project Total
					$0
	Sub-total	$0	$0	$0	$0
Total Contractual		$80,900	$118,500	$16,000	$215,400

Construction

Construction, for the purpose of budgeting, is defined as all types of work done on a particular facility, including erecting, altering, or remodeling. Construction conducted by the award recipient should be justified in this category. Any construction work that is performed by a vendor or subrecipient to the award recipient should be entered under "Contractual."

List all proposed construction below, providing a basis of cost such as engineering estimates, prior construction, etc., and briefly justify its need as it applies to the Statement of Project Objectives. For major endeavors, a copy of the engineering estimate or quote should also be provided.

Overall description of construction actiivities:			
Example Only!!! - Build wind turbine platform			
General Description	Cost	Basis of Cost	Justification of need
Budget Period 1			
Three days of excavation for platform site EXAMPLE ONLY!!!	$28,000	Engineering estimate	Site must be prepared for construction of platform.
Budget Period 1 Total	$28,000		
Budget Period 2			
Budget Period 2 Total	$0		
Budget Period 3			
Budget Period 3 Total	$0		

PROJECT TOTAL	$28,000		

Other Direct Costs

Other direct costs are direct cost items required for the project which do not fit clearly into other categories, and are not included in the indirect pool for which the indirect rate is being applied to this project. Examples are meeting costs, postage, couriers or express mail, telephone/fax costs, printing costs, etc.

Basis of cost are items such as vendor quotes, prior purchases of similar or like items, published price list, etc.

General description	Cost	Basis of Cost	Justification of need
Budget Period 1			
EXAMPLE ONLY!!! Grad student tuition	$16,000	Established UCD costs	Support of graduate students working on project
Budget Period 1 Total	$16,000		
(repeat as necessary for each Budget Period)			

Indirect Costs

A federally approved indirect rate agreement, or rate proposed supported and agreed upon by DOE for estimating purposes is required if reimbursement of indirect benefits is requested. If there is a federally approved indirect rate agreement, a copy must be provided with this application and if selected, must be provided electronically to the Contracting Officer for this project. If there is no current, federally approved indirect rate agreement or if the federally approved indirect rate agreement has been changed or updated, a rate proposal must be included with the application. If selected, the rate agreement will be finalized during award negotiations. Calculate the indirect rate dollars and enter the total in the Section B., line 6.j. (Indirect Charges) of form SF 424A.

	Budget Period 1	Budget Period 2	Budget Period 3	Total
Rate applied:	0.0%	0.0%	0.0%	
Total indirect costs requested:				$0

Cost Share

See also FOA Appendix C, Cost Share.

A detailed presentation of the cash or cash value of all cost share proposed for the project must be provided in the table below. Identify the source and amount of each item of cost share proposed by the award recipient and each sub-recipient or vendor. Letters of commitment must be submitted for all third party cost share (other than award recipient). See FOA, Part IV.C.f, Letters of Commitment.

Note that “cost-share" is not limited to cash investment. Other items that may be assigned value in a budget as incurred as part of the project budget and necessary to performance of the project, may be considered as cost share, such as: contribution of services or property; donated, purchased or existing equipment; buildings or land; donated, purchased or existing supplies;

and/or unrecovered personnel, fringe benefits and indirect costs, etc. For each cost share contribution identified as other than cash, identify the item and describe how the value of the cost share contribution was calculated.

Funds from other Federal sources MAY NOT be counted as cost share. This prohibition includes FFRDC sub-recipients. Non-Federal sources include private, state or local Government, or any source not originally derived from Federal funds. If selected, documentation of cost sharing commitments must be provided during award negotiations unless they have not changed since its submission.

Fee or profit will not be paid to the award recipients or subrecipients of financial assistance awards. Additionally, foregone fee or profit by the applicant shall not be considered cost sharing under any resulting award. Reimbursement of actual costs will only include those costs that are allowable and allocable to the project as determined in accordance with the applicable cost principles prescribed in 10 CFR 600.127, 10 CFR 600.222 or 10 CFR 600.317. Also see 10 CFR 600.318 relative to profit or fee.

Organization/Source	Type (cash or other)	Cost Share Item	Budget Period 1 Cost Share	Budget Period 2 Cost Share	Budget Period 3 Cost Share	Total Project Cost Share
ABC Company EXAMPLE ONLY!!!	Cash	Project partner ABC Company will provide 40 PV modules for product development at 50% off the of the retail price of $680	$13,600			$13,600
						$0
						$0
		Totals	$0	$0	$0	$0
Total Project Cost:		$312,300		Cost Share Percent of Award:		0.0%

American Recovery and Reinvestment Act Information:
Applications shall provide information which validates that all laborers and mechanics on projects funded directly by or assisted in whole or in part by and through funding appropriated by the Recovery Act are paid wages at rates not less than those prevailing on projects of a character similar in the locality as determined by subchapter IV of Chapter 31 of title 40, United States Code (Davis-Bacon Act). For guidance on how to comply with this provision, see http://www.dol.gov/esa/whd/contracts/dbra.htm.

To satisfy this requirement, please provide a written affirmation that you will comply with the Davis-Bacon Act, as identified above, along with the signature of the authorized representative of your organization.

Appendix I – Petroleum Displacement Analysis

Include estimates of barrels of oil displaced via production of a biofuel, chemical, or substitute for petroleum-based feedstocks or products, or energy (heat and power). An estimate for the proposed facility should be developed as well as an estimate for the envisioned first commercial facility. Explain assumptions. Cite references on energy content of the chemical or substitute for petroleum-based feedstocks or products. Employ the following table to document oil displacement:

Calculating energy impacts in barrels of oil				
Product (provide units)	**BTU or Joule content per L or kg**	**Annual output planned for this plant based on L or kg**	**Btu of total output per annum for this facility (convert Joules to BTUs)**	**Equivalent Barrels of Oil**
Ethanol (L)	20,166	20,000,000	403,320,000,000	74,056
Electricity (per kg biomass)	10,000	55,000,000,000	55,000,000,000	10,099
Biofuel 1				
Bioproduct 2				
			Total Facility Impact (bbl)	

Notes for Table: Ethanol and power are given as examples. In the case of power or heat, the entry in column 4 will be the same as the entry in column 3 (basis for this example is 50 metric tonnes/d converted to electricity at a 30% conversion efficiency operating 365 days per year). Employ the lower heating value (LHV) of any biofuel produced (ethanol is 20,166 Btu/L or 76,330 Btu/gal) per the Hydrogen Analysis Resource Center website cited below. Use the LHV when available, otherwise, use the HHV. (Since the Energy Information Agency does not provide the hydrogen content of gasoline or crude oil, it is hard to estimate a LHV for comparison and best estimates are requested). Recommended sources of LHV data are the Hydrogen Analysis Resource Center: Lower and Higher Heating Values of Hydrogen and Fuels (http://hydrogen.pnl.gov/cocoon/morf/projects/hydrogen/datasheets/lower_and_higher_heating_values.xls) and the API Technical Data Book.

In this table, show barrels of oil displaced for this plant. In the "Petroleum Displacement Analysis" also describe the total barrels of oil displaced based on a realistic market penetration estimate if the operation is producing products successfully. Represent % market penetration by the number of plants estimated to be built by the applicant as a result of this first proposed plant, with specific output capacity as a percentage of the output that would meet the needs for projected markets in 2015. Use EIA market projections, Chemical Economics Handbook values or other citable source for 2015 numbers.

Appendix J - Points of Clarification Regarding Algae

Algae are an "acceptable feedstock" in this FOA. It is recognized under this FOA that algae have a broader role than the other acceptable feedstocks because they also act as biocatalysts (similar to an enzyme or ethanologen for lignocellulosic biomass conversion) accumulating lipids (algal-crudes) and starch-based carbohydrates or excreting ethanol. Therefore, the production of algae using a variety of available cultivation strategies (e.g. open-ponds, open oceans, closed bioreactors supporting phototrophic and/or heterotrophic growth) is allowable under all Topic Areas of this FOA.

Since carbon-dioxide (CO_2) is used as a "nutrient" for algae, under most cultivation conditions, sourcing CO_2 from the atmosphere or from power plants is acceptable. However, pumps, pipelines, filters, etc. that are outside the battery limits of the algal based biorefinery required to source the CO_2 are not acceptable for DOE cost-share under the scope of this FOA. Pumps, pipes, filters, etc. that are within the battery limits of the algal based biorefinery and required to source the CO_2 are acceptable for DOE cost-share under the scope of this FOA. All costs for sourcing CO_2, whether inside or outside the battery limits, should be reflected in the pro forma. Water and micronutrients will be considered as allowable operational or processing costs for DOE cost-share, particularly if waste water is to be used as both a source of water for the process and as a source of micronutrients. Further treatments of waste water, if necessary, are allowable processing costs for DOE cost-share.

Algae can be grown under solely phototrophic conditions (in which CO_2 is the main carbon source) or under mixed condition (in which CO_2 and/or other sources of carbon can be utilized). In the latter "heterotrophic" cases, the acceptable main carbon source could be biomass hydrolysates, glycerol, or any other non-food derived carbon source. Sugars from food sources are not acceptable for growing algae under this FOA except as otherwise specified (i.e. residual sugar remaining after normal processing for food, or sugar contained in energy crops).

Algal based integrated biorefinery applications will use a mass balance calculation using CO_2 (or other main carbon source) to justify meeting the minimum feedstock throughput requirements for the selected Topic Area, in order to be comparable to terrestrial (i.e. land grown) lignocellulosic feedstock based biorefinery applications. Specifically:

- For Topic Areas 1, 2, or 5 algal based integrated pilot facilities must have a throughput of no less than one (1) dry tonne of CO_2 or other main carbon source.
- For Topic Areas 3, 4, or 6, algal based integrated demonstration facilities must have a throughput of no less than fifty (50) dry tonnes per day of CO_2 or other main carbon source.

For this FOA, the algae production component of the conversion is considered to be the "novel/breakthrough" technology, which would be integrated for the first time with the downstream conversion components. Algal-crudes can be converted either by refinery hydrocracking/hydrotreating processes to produce a renewable diesel or by the transesterification process to produce bio-diesel. Although these downstream conversion methods could be considered commercially available, they would be allowable costs under this FOA, since they

have not been proven to work on algal-crudes. These production costs should be included in the pro forma.

It is recognized that processes may vary from one algal biorefinery to another and there is no set methodology for algal biorefinery LCAs. Therefore, the FOA does not provide detailed guidelines for completing an LCA. However, an LCA is required, and it is recommended that the LCA include, at a minimum, the following (or equivalent) steps: gas analysis of the flue gas from the Continuous Emission Monitor (CEM) at the power plant, volumetric flowrate of flue gas slipstream being sent to the algal biorefinery, predicted capture of CO_2 from flue gases generated in power plants; distribution of flue gas/CO_2; algae production; algae harvesting; and algae conversion to produce biofuel. The scenario and inputs used in each application must relate to the application's process flow diagram and mass and energy balances required to be submitted in other sections of this FOA. The application must be able to demonstrate the basis for assumptions (such as extrapolated from bench or pilot data, use of models, etc.), rationale for choice of LCA method, and reference to the LCA method. The standardized units used in the GREET model should be used whenever possible and reasonable.

Note that algae based biorefinery applications will still have to meet all other requirements in the FOA, such as having data to back up the state of technology for scale up to the selected Topic Area, and will be subject to the same criteria as all other applications.