FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT

U.S. Department of Energy
Energy Efficiency and Renewable Energy
Golden Field Office

Bio-Oil Stabilization and Commoditization
Funding Opportunity Announcement Number: DE-FOA-0000686
Announcement Type: Amendment No. 001
CFDA Number: 81.087

Issue Date:	**April 5, 2012**
Letter of Intent Due Date:	**May 1, 2012**
Application Due Date:	**May 29, 2012, 5:00 PM Eastern Time**

Applicants must submit a Letter of Intent by the due date to be eligible to submit a Full Application

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

DE-FOA-0000686
Amendment No. 001

DATE: April 17, 2012
FROM: Melissa Wise, Contracting Officer
TO: All Prospective Applicants

SUBJECT: Amendment No. 001 to Announcement DE-FOA-0000686, "Bio-Oil Stabilization and Commoditization"

The purpose of this Amendment is to:

1. Delete and replace Section VI.B.4, "Statement of Substantial Involvement," to read:

   Statement of Substantial Involvement
   Either a grant or cooperative agreement may be awarded under this announcement. If the award is a cooperative agreement, the DOE Specialist and DOE Project Officer will negotiate a Statement of Substantial Involvement prior to award.

   In the event of a cooperative agreement, DOE has the right to intervene in the conduct or performance of project activities for programmatic reasons. Intervention includes the interruption or modification of the conduct or performance of project activities.

All other parts of the Announcement remain unchanged.

REGISTRATION REQUIREMENTS

There are several one-time actions before submitting an Application in response to this Funding Opportunity Announcement (FOA), as follows:

- Register and create an account on EERE Exchange at https://eere-exchange.energy.gov/. This account will then allow the user to register for any open EERE FOAs that are currently in EERE Exchange. It is recommended that each organization or business unit, whether acting as a team or a single entity, use only one account as the contact point for each submission.

  The applicant will receive an automated response when the Letter of Intent or Application is received. This will serve as a confirmation of receipt. Please do not reply to the automated response. The applicant will have the opportunity to re-submit a revised Letter of Intent or Application for any reason as long as the relevant submission is submitted by the specified deadline. The Users' Guide for Applying to the Department of Energy EERE Funding Opportunity Announcements is found at https://eere-exchange.energy.gov/Manuals.aspx.

  The EERE Exchange registration does not have a delay; however, the remaining **registration requirements below could take several weeks to process and are necessary in order for a potential applicant to receive an award under this announcement**. Therefore, although not required in order to submit a Letter of Intent or an Application through the EERE Exchange site, **all potential applicants lacking a DUNS number, or not yet registered with CCR or FedConnect should complete those registrations as soon as possible**.

  Questions regarding the content of this announcement must be submitted to: EE0000686@go.doe.gov no later than five (5) business days prior to the application due date.

  All questions and answers related to this FOA will be posted on EERE Exchange at: https://eere-exchange.energy.gov/. **Please note that you must first select this specific FOA Number in order to view and the questions and answers specific to this FOA**. DOE will attempt to respond to a question within 3 business days, unless a similar question and answer has already been posted on the website.

  Questions related to the registration process and use of the EERE Exchange website should be submitted to: EERE-ExchangeSupport@hq.doe.gov.

- Obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number (including the plus 4 extension, if applicable) at http://fedgov.dnb.com/webform.

- Register with the Central Contractor Registry (CCR) at https://www.ccr.gov/. Designating an Electronic Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in CCR registration. Please update your CCR registration annually.

- Register in FedConnect at https://www.fedconnect.net/. To create an organization account, your organization's CCR MPIN is required. For more information about the CCR MPIN or other registration requirements, review the FedConnect Ready, Set, Go! Guide at https://www.fedconnect.net/FedConnect/PublicPages/FedConnect_Ready_Set_Go.pdf.

- Register in Grants.gov to receive automatic updates when Amendments to this FOA are posted. However, please note that letters of intent or applications will not be accepted through Grants.gov. http://www.grants.gov/.

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SECTION I – FUNDING OPPORTUNITY DESCRIPTION

A. Description

This Funding Opportunity Announcement (FOA) is intended for research and development (R&D) at either (1) **Technology Readiness Levels** (TRLs) 2 through 3 in Topic Area 1 or (2) TRL 4 through 6 in Topic Area 2, that will accelerate the development of thermochemical liquefaction technologies to produce a **bio-oil feedstock** from biomass considered to be a **high-impact feedstock** or from **algal biomass**. Please see Appendix E for a definition of Technology Readiness Levels. The bio-oil feedstock produced must be utilized within a petroleum refinery and leverage its existing capital for further processing to final fuels (such as renewable: gasoline, diesel, jet fuel) that will contribute to the Energy Independence and Security Act of 2007, Renewable Fuels Standard volumetric goals for **advanced biofuels**. Please see Appendix G for further information on the Renewable Fuels Standard.

DOE's vision is that bioenergy feedstocks are produced and/or collected in a sustainable manner. Eligible feedstocks for this FOA must be considered high impact feedstocks that have the ultimate agronomically and ecologically sustainable potential of producing at least 50 million dry tonnes per year in the United States. The Billion-Ton Update (report link: http://www1.eere.energy.gov/biomass/pdfs/billion_ton_update.pdf, data link: https://bioenergykdf.net/content/billiontonupdate) provides estimates of potential biomass available within the contiguous United States based on assumptions about current and future inventory production capacity, availability, technology, and sustainability. DOE recommends that applicants consider these scenarios or other peer-reviewed public datasets to select the high impact feedstock(s) for this FOA application. As defined for this FOA, sustainable bioenergy feedstock sources are ones that are managed to reduce required inputs, such as water and nutrients; can potentially improve soil health and water quality, may provide additional ecosystem services, and the feedstock itself is not considered an invasive species where it will be grown. Projects may also propose technologies utilizing oils extracted from algae that could be accepted into a petroleum refinery for further processing to the final products as stated above. Heterotrophic algae will be considered only if grown using a high-impact cellulosic biomass-derived feedstock so that the final fuel will be an advanced biofuel. Tasks related to the development of algal strains, cultivation, growing, and harvesting are specifically excluded from this FOA and applications proposing such efforts will be deemed non-responsive and excluded from further consideration.

Applicants must propose an algae or thermochemical liquefaction conversion pathway for producing a bio-oil feedstock that can be utilized at one or more **insertion points** within a petroleum refinery, such as in the hydrotreaters, reformers, fluid catalytic crackers, cokers, isomerization units, or hydrocrackers. There may be other insertion points that are unique to the targeted petroleum refinery and this should be addressed in the application. For the purpose of this FOA, insertion points are defined as any point after vacuum or atmospheric distillation within the refinery where a feedstock can be inserted for additional processing. **Applications proposing to blend a bio-oil feedstock *only* at the beginning of the refining process with the crude oil (i.e. pre-vacuum distillation or pre-atmospheric distillation) or *only* at the end of the refining process as finished fuels (i.e. blending) will not be considered responsive to this FOA and will be excluded from further consideration. Also note that projects proposing**

gasification or biodiesel (FAME) conversion technologies are not considered responsive to this FOA and will be excluded from further consideration.

Topic Area 1 applicants are not required to have a petroleum refinery partner at the time of application but must describe their plans to overcome R&D barriers for making bio-oil feedstock acceptable in a petroleum refinery and engage with the intent to secure a refinery partner by the end of the project. Engaging a petroleum refinery partner by the end of the project period is a key project deliverable for Topic Area 1 and it is anticipated that a partnership of this nature would be critical to secure the funding necessary to enable advancement of the technology.

Topic Area 2 applicants must have a petroleum refinery partner secured at the time of application and this partnership should be evident in a coordinated R&D work plan for making bio-oil feedstock acceptable to a petroleum refinery for further processing to transportation fuels and other co-products. One of the key project deliverables for Topic Areas 2 is an engineering design package for a future pilot scale facility for producing bio-oil feedstock to be integrated into an existing refinery.

Successful applicants to this funding opportunity must also:

- Identify the type(s) of biomass or algae oil being utilized and describe how it meets the high-impact feedstock definition.
- Describe each unit operation involved in the proposed process for converting biomass or algae to an acceptable bio-oil feedstock that can be integrated into a petroleum refinery at the intended insertion points, as well as describing the refinery processes to produce finished transportation fuels and co-products through these insertion points. This process description must match the block flow diagram requested in the Technical and Financial Data spreadsheet as described in Section IV.C.14.
    - For Topic Area 1, this entails a discussion of possible refinery insertion points for the bio-oil feedstock – in terms of generic unit operations (e.g. Fluidized Catalytic Cracking (FCC) unit, hydrocracker, hydrotreater etc.) – and why the bio-oil feedstock would be amenable to blending with petrochemical streams in the noted unit operations.
    - For Topic Area 2, this entails a discussion of the intended refinery insertion points for the bio-oil feedstock and projected volumetric bio-oil throughput capacity in the specified unit operations. Also, highlight by unit operation, the existing capital in the refinery that is being leveraged and address the bio-oil feedstock material compatibility, corrosivity, and potential impacts on accelerated capital depreciation. Discuss any potential modification to existing equipment or processes within a refinery that would be necessary to enable an acceptable bio-oil feedstock. Describe the cost trade-offs in making these modifications.
- Identify the **technical baseline**. The technical baseline means the proven, technical achievements for all key unit operations to produce a bio-oil feedstock at the time of the application, as well as any proven, technical achievements in utilizing the refinery processes to produce finished fuels and co-products through the intended insertion points. The bio-oil feedstock that can be produced at the time of application and is based on proven, technical achievements is referenced in this FOA as the **baseline**

bio-oil feedstock. The work proposed under this FOA is intended to improve upon the baseline bio-oil feedstock to make it an **acceptable bio-oil feedstock**. This must include:

  - A qualitative and quantitative analysis of the baseline bio-oil feedstock's physical properties and chemical composition. Discuss the analytical methods used in the Process Analytics tab of the Technical and Financial Data spreadsheet described in Section IV.C.14. Also, describe the necessary physical properties and chemical composition required by the refinery partner at the intended insertion points in order to be an acceptable bio-oil feedstock. For Topic Area 1, this description may be conceptual in nature.
  - Summarize technical achievements and highlight supportable data for all the key unit operations involved in the proposed process as described in the Technical and Financial Data Spreadsheet in Section IV.C.14. Include a description of scale, time on stream, catalyst type, continuous hours, and cumulative hours or other metrics associated with each unit operation. In the event that published or modeled data is used to form the basis of the proposed process, provide a reference and describe the relevance to the proposed technology.

- Identify the R&D barriers currently preventing the baseline bio-oil feedstock from being an acceptable bio-oil feedstock at the intended insertion points in a refinery. This includes scale-up and process integration, to reaching the technical targets from the technical baseline. The Department of Energy (DOE) Office of the Biomass Program has identified certain barriers that currently prevent bio-oil from being accepted in a petroleum refinery (Appendix D). Applicants should not consider the list in Appendix D to be all-inclusive; other R&D barriers specific to their baseline bio-oil feedstock and chosen technology pathway will likely exist and should be discussed in the application.
- Projects must address market and regulatory barriers and explain how their approach would produce transportation fuel(s) that would qualify as an advanced biofuel as per the Energy Independence and Security Act of 2007 (EISA), Renewable Fuel Standard (RFS). This should include, but is not limited to:
  - Presenting a preliminary lifecycle assessment (LCA), including greenhouse gas (GHG) emissions reductions;
  - Discussing how Renewable Identification Number (RIN) credits might be allocated and how the proposed process would gain Environmental Protection Agency acceptance for RIN credits;
  - Demonstrating the potential of their proposed process to contribute to the EISA RFS volumetric requirements (see Appendix G).
- Provide a discussion of project deliverables. For both Topic Areas, this must include a techno-economic analysis and LCA of the proposed process for the envisioned first commercial scale facility. Additionally,
  - Topic Area 1 must include a detailed plan to engage with the intent to secure a refinery partner during the project period. Evidence of securing a refinery partner can come in the form of a letter of intent supplied by the refinery partner at the end of the project period. This letter should affirm that the refinery partner is willing to help define the specifications for an acceptable bio-oil feedstock and identify potential insertion points in their refinery.

    - Topic Area 2 must include a preliminary engineering design package for a pilot-scale facility (TRL 7) for the proposed process by the end of the project period.
- Present a work plan that addresses the R&D, market, and regulatory barriers. The work plan should show how technical targets and other project deliverables will be achieved. The work plan should also identify the key risk areas and discuss risk mitigation strategies.
    - For Topic Area 1, the work plan should be developed with the intention to engage and secure a refinery partner, this would include but may not be limited to:
        - Generating statistically significant and reproducible data via lab/bench scale R&D (at TRLs 2-3) and process modeling to inform a techno-economic analysis and life cycle assessment of the proposed process (such as in the Technical and Financial Data Spreadsheet in Section IV.C.14).
        - Providing potential refinery partners with sufficient samples of a bio-oil feedstock by the end of the project period to conduct any necessary lab/bench scale R&D (TRLs 2-3), analysis, and process modeling to evaluate potential insertion points. This should also include an analysis of compatibility with materials of construction.
    - For Topic Area 2, the work plan should be coordinated at the onset with a refinery partner, this should include but may not be limited to:
        - Obtaining direct input from a refinery partner regarding the chemical and physical specifications required for an acceptable bio-oil feedstock at one or more insertion points in a refinery. An initial assessment of a specific insertion point or points is preferred.
        - Providing the refinery partner with sufficient samples of bio-oil feedstock during the project period to conduct any necessary lab/bench scale R&D (TRLs 4-6), analysis, and process modeling to evaluate its acceptability at the identified insertion points. This should also include an analysis of compatibility with materials of construction.
        - Generating statistically significant and reproducible data via lab/bench scale R&D (TRLs 4-6) and process modeling to inform a techno-economic analysis and life cycle assessment, as well as an engineering design package for a pilot scale facility (TRL7) of the proposed process (such as in the Technical and Financial Data Spreadsheet in Section IV.C.14).
        - Using an effective risk management and change control process that will be put into full effect at the onset of the project to mitigate cost, schedule, and technical impacts.
- Provide a resource loaded schedule (in the form of a Gantt chart or similar format). Identify key milestones and explain how those milestones measure progress towards achieving the project's technical targets and other project deliverables on cost and schedule. The resource loading must also show which organization or individual will be responsible for each aspect of the project.
    - Topic Area 2 applicants must employ a stage gate management process, with clearly defined go/no-go decision points. The go/no go decision points must

be mapped to the resource loaded schedule.

- Define the applicant's rights to use the technology with respect to intellectual property rights.
- Conceptually describe the commercialization pathway for the proposed technology.
- Discuss the market potential in terms of reproducibility such as refinery type, number of facilities of that type, and strategies for meeting the requirements of multiple refineries with the proposed bio-oil refinery feedstock.
- Discuss the experience, capabilities, and facilities that will be made available to the project as demonstrated in the resource loaded project management plan. The relevance of each, including previous experience, must be discussed.
- Discuss the sustainability metrics captured in the Technical and Financial Data Spreadsheet in Section IV.C.14.

Programmatic Background

The DOE Office of the Biomass Program directly supports three of EERE's nine strategic goals including "dramatically reduce, or even end, dependence on foreign oil," "increase the viability and deployment of renewable energy technologies," and "spur the creation of a domestic bio industry." Technologies developed during successful completion of this FOA are directly aligned with these goals.

Title 2 of the Energy Independence and Security Act of 2007 (EISA) supports "energy security through increased production of biofuels," including a Renewable Fuels Standard (RFS, EISA Section 202). EISA Section 201B defines advanced biofuels as, "renewable fuel, other than ethanol derived from corn starch that has lifecycle greenhouse gas (GHG) emissions… that are at least 50 percent less than baseline lifecycle GHG emissions." This FOA aligns directly with the RFS outlined in EISA 2007.

"Raising fuel economy standards, gradual electrification of the vehicle fleet, and increasing production of advanced biofuels" are specified in the May 2011 DOE strategic plan for decreasing petroleum use. This plan also points to the DOE's Quadrennial Technology Review (QTR) as the first step in building a National Energy Plan. The QTR identifies transportation energy security as one of the nation's "two energy challenges." This FOA seeks to accelerate development of advanced biofuels, and hydrocarbon transportation fuels from thermochemical liquefaction technologies utilizing high-impact biomass feedstocks, or from algal oil.

Applicants must select one, and only one, Topic Area for EACH of their proposed product(s) and process(s). If an Applicant submits applications proposing the same product and process to both Topic Areas, DOE will review only the last, on-time application submitted in Exchange.

SECTION II – AWARD INFORMATION

A. Type of Award Instrument

Grants and Cooperative Agreements

- DOE anticipates awarding both grants and cooperative agreements under this program

announcement. If it is determined that a cooperative agreement is the appropriate award instrument, the nature of the Federal involvement will be included in a special award condition.

B. Estimated Funding

Amount New Awards

- Approximately $15,000,000 is expected to be available for new awards under this announcement. All awards under this announcement are subject to appropriation and availability of funding.

C. Maximum and Minimum Award Size

Topic Area 1:

- Ceiling (i.e., the maximum amount for an individual award made under this announcement): $ 750,000
- Floor (i.e., the minimum amount for an individual award made under this announcement): $400,000

Topic Area 2:

- Ceiling (i.e., the maximum amount for an individual award made under this announcement): $4,000,000
- Floor (i.e., the minimum amount for an individual award made under this announcement): $1,000,000

D. Expected Number of Awards

Number of Awards per Topic Area

- Under this announcement, DOE expects to make the following number of awards for each Topic Area:

Topic Area	Number of Awards
1	5-6
2	3-4

- DOE may select more or fewer applications out of each Topic Area depending on the merit of the applications received.

E. Anticipated Award Size

Award Size Per Topic Area

The anticipated award size for projects under each Topic Area in this announcement is:

Topic Area	Anticipated Award Size
1	Up to $750,000
2	Up to $4,000,000

F. Period of Performance

Period of Performance Per Topic Area
The anticipated period of performance for projects under each Topic Area in this announcement is:

Topic Area	Period of Performance
1	1 year
2	3 years

G. Type of Application

New Applications Only
DOE will accept only new applications under this announcement (i.e., applications for renewals of existing DOE funded projects will not be considered).

Applicants must select one, and only one, Topic Area for EACH of their proposed product(s) and process(s). If an Applicant submits applications proposing the same product and process to both Topic Areas, DOE will review only the last, on-time application submitted in Exchange.

SECTION III - ELIGIBILITY INFORMATION

A. Eligible Applicants

Applicants must submit a Letter of Intent by the due date to be eligible to submit an Application.

Applicants must select one, and only one, Topic Area for EACH of their proposed product(s) and process(s). If an Applicant submits applications proposing the same product and process to both Topic Areas, DOE will review only the last, on-time application submitted in Exchange.

Domestic Entities Excluding Nonprofit - 501(c)(4)

- The following domestic entities are eligible to apply, except nonprofit organizations described in section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995. Other Federal agencies are specifically excluded. Eligible applicants include but are not limited to: (1) institutions of higher education; (2) nonprofit and for-profit entities; (3) State and local governments; (4) Indian tribes and Tribal Energy Resource Development Organizations; (5) Federally Funded Research and Development Center (FFRDC) Contractors; and (6) consortia of entities (1) through (5). If applying as a consortium, an established member of the consortium must be designated as the lead applicant.

B. Cost Sharing

Cost Share 20%

- The cost share must be at least 20% of the total allowable costs for research and development projects (i.e., the sum of the Government share, including FFRDC contractor costs if applicable, and the recipient share of allowable costs equals the total allowable cost of the project) and must come from non-Federal sources unless otherwise allowed by law. (See 10 CFR Part 600 for the applicable cost sharing requirements.)

C. Other Eligibility Requirements

- **DOE National Laboratory Contractors and Other Federally Funded Research and Development Center (FFRDC) Contractors**.

  A DOE National Laboratory Contractor is eligible to apply for funding under this announcement if its cognizant Contracting Officer provides written authorization and this authorization is submitted with the application. If a DOE National Laboratory Contractor is selected for award, the proposed work will be authorized under the DOE work authorization process and performed under the laboratory's Management and Operating (M&O) contract.

  Please be advised that those entities that form teams with National Laboratories in which the Laboratory is a Prime Recipient (i.e., lead participant) will be required to enter into subcontracts with the Laboratory. As such, the terms and conditions of the Management and Operating contract between the Laboratory and the Department of Energy will be in effect

for any subcontracts, and not the traditional provisions associated with a financial assistance award. National Laboratories acting as Prime Recipients must make all applicable terms and conditions available to their subcontractors prior to submission of their applications. Any entities considering such teaming arrangements should request the Laboratory to provide the applicable terms and conditions prior to the Prime Recipient submitting an application in response to this FOA.

The following wording is acceptable for the 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.

FFRDC contractors may be proposed as team members 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.

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 cost of the project, including the applicant's and the FFRDC contractor's portions of the effort.

FFRDC Contractor Effort: FFRDC contractors may participate as either the applicant or as a participant on another application. In the event that the FFRDC contractor is a participant on an application submitted by another organization, the scope of work to be performed by the FFRDC contractor may not be more significant than the scope of work to be performed by the applicant.

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 FFRDC contractor.

SECTION IV – APPLICATION AND SUBMISSION INFORMATION

A. Address to Request Application Forms

The Application forms and instructions are available on EERE Exchange. To access these materials, go to https://eere-exchange.energy.gov/ and select the appropriate funding opportunity number.

B. Letter of Intent and Pre-Application

Letter of Intent is required.
Applicants are required to submit a Letter of Intent prior to the application submission. Letters of Intent will be used by DOE to plan for the merit review process. **The letters must not contain any proprietary or sensitive business information.** The letters will not be used for down-selection purposes, and do not commit an applicant to submit an application. **However, applicants must submit a Letter of Intent by the due date to be eligible to submit a Full Application.** A **Control Number** will be issued when an applicant begins the Letter of Intent submission process. This **Control Number must** be included with the Application documents, as described in Section C. below.

The Letter of Intent must include the following information:

1. Applicant Name
2. Title of the project
3. One or two sentence description of the topic
4. Estimated total DOE funding request
5. Point of Contact
6. Selected Topic Area
7. Subrecipients, vendors, and other project partners

Letter of Intent due date and time: May 1, 2012 at 5:00 PM Eastern Time

Letters of Intent must be submitted via EERE Exchange at https://eere-exchange.energy.gov/.

Pre-application

- A pre-application is not required.

C. Content and Form of Application

You must complete the following application forms found on the EERE Exchange website at https://eere-exchange.energy.gov/, in accordance with the instructions. **Applicants will receive a Control Number once they "Apply to this FOA" on the EERE Exchange website and should include the Control Number in the file name, as indicated below. This Control Number is issued at the time the Letter of Intent is submitted.**

1. **SF-424 – Application for Federal Assistance**
   Complete all required fields in accordance with the instructions on the form. The list of

certifications and assurances in Field 21 can be found at http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms, under Certifications and Assurances. Note: The dates and dollar amounts on the SF 424 are for the complete project period and not just the first year, first phase or other subset of the project period. Save the information in a single file titled "ControlNumber_LeadOrganization_App424."

2. **Project Summary/Abstract File**
The project summary/abstract must contain a summary of the proposed activity suitable for dissemination to the public. It should 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). THIS DOCUMENT MUST NOT INCLUDE ANY PROPRIETARY OR SENSITIVE BUSINESS INFORMATION, AS THE DEPARTMENT MAY MAKE IT AVAILABLE TO THE PUBLIC IF AN AWARD IS MADE. 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), single spaced, with font not smaller than 11 point. Save the information in a single file titled "ControlNumber_LeadOrganization_Summary."

3. **Project Narrative File**
The project narrative must not exceed **25** pages for a Topic Area 1 application or **35** pages for a Topic Area 2 application, including cover page, 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), single spaced. EVALUATORS WILL REVIEW ONLY THE FIRST 25 PAGES OF A TOPIC AREA 1 APPLICATION, OR THE FIRST 35 PAGES FOR A TOPIC AREA 2 APPLICATION. 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 Section VIII.D for instructions on how to mark proprietary application information. Save the information in a single file titled "ControlNumber_LeadOrganization_Project."

The project narrative must include:

- Merit Review Criterion Discussion.
This section should be formatted to address each merit review criterion and sub-criterion listed in Part V. A. below. Provide sufficient information so that reviewers will be able to evaluate the application in accordance with these merit review criteria. DOE WILL EVALUATE AND CONSIDER ONLY THOSE APPLICATIONS THAT ADDRESS EACH MERIT REVIEW CRITERION AND SUB-CRITERION.

- Roles of Participants:
For multi-organizational or multi-investigator projects, describe the roles and the work to be performed by each participant/investigator, business agreements between the applicant and participants, and how the various efforts will

be integrated and managed.

- Facilities and Other Resources:
  Identify the facilities (e.g., office, laboratory, computer, etc.) to be used at each performance site listed, and, if appropriate, indicate their capacities pertinent capabilities, relative proximity, and extent of availability to the project. Describe only those resources that are directly applicable to the proposed work. Provide any information describing the other resources available to the project, such as machine and electronics shops.

- Equipment:
  List important items of equipment already available for this project, and if appropriate, note the location and pertinent capabilities of each. If you are proposing to acquire equipment, describe comparable equipment, if any, already at your organization and explain why it cannot be used.

- Bibliography and References, if applicable:
  Provide a bibliography for any references cited in the Project Narrative section. This section must include only bibliographic citations.

- Statement of Project Objectives (SOPO):
  The Statement of Project Objectives should be provided in a similar format as the SOPO template shown in Appendix F. The SOPO must address how the project objectives will be met. It must contain a clear, concise description of all activities to be completed during the project performance and follow the requirements in the template. The SOPO may be released to the public by DOE, in whole or in part, at any time. Therefore, it is required that it shall not contain proprietary or confidential business information.

- Business and Commercialization Plan
  Although it may only be conceptual in nature, the applicant must prepare a plan to proceed from the proposed project to a forecast commercial facility, including any intermediate pilot or demonstration facilities, and must correlate the plan with the parameters in the Technical and Financial Data spreadsheet as described in Section IV.C.14. 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 liquid hydrocarbon product. The Business and Commercialization Plan (Plan) must provide a reasonable scenario that describes how the proposed technology and resulting bio-oil feedstock could be successfully commercialized in the near term. The Plan must describe how the work proposed in the application supports the forecast commercialization, and how the outcomes of the project justify the investment of Federal funds. The Plan should describe what is envisioned for the eventual commercialization of the proposed technology by providing 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.

- IP Statement
  Identify the ownership of any intellectual property (IP) necessary to accomplish the proposed tasks. If the IP is not owned by the applicant, or a named project partner, discuss any plans to secure rights to the IP for the purpose of the proposed project. Also, if the IP has been licensed to any other parties, provide a discussion of the arrangement and any potential impacts on the applicant's ability to complete the proposed project.

  All the components of your Project Narrative must be within the Narrative page limit specified in paragraph 3. 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.

4. Resume File

Provide a resume for each key person proposed, including subawardees and consultants if they meet the definition of a key person. A key person is any individual who contributes in a substantive, measurable way to the execution of the project. The biographical information for each resume must not exceed 2 pages when printed on 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right), single spaced, with font not smaller than 11 point and should include the information below, if applicable. Save the information in a file titled "ControlNumber_LeadOrganization_Resume."

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.

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(s) (PI(s)).

- For Multiple Principal Investigators:

  The applicant, whether a single organization or team/partnership/consortium, must indicate if the project will include multiple PIs. The decision to use multiple PIs for a project is the sole responsibility of the applicant. If multiple PIs will be designated, the application must identify the Contact PI/Project Coordinator and provide a "Coordination and Management Plan" that describes the organization structure of the project as it pertains to the designation of multiple PIs. This plan should, at a minimum, include:

  - Process for making decisions on scientific/technical direction;
  - Publications;
  - Intellectual property issues;
  - Communication plans;
  - Procedures for resolving conflicts; and
  - PIs' roles and administrative, technical, and scientific responsibilities for the project.

  For Topic Area 2 applications only, of the key personnel identified in this file, indicate the Project Coordinator or Lead Point of Contact for the refinery partner.

  The resume file does not have a page limitation.

5. **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. The SF424A provides columns for each individual budget-year as well as the cumulative project-budget. The total project cost, including cost share and Federal funding, must be represented in this document. Use the SF 424 A Excel, "Budget Information – Non Construction Programs" form on the DOE Financial Assistance Forms Page at http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms.

   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 Section IV, G). Save the information in a single file titled "ControlNumber_LeadOrganization_SF424A"

6. **Budget Justification File (PMC 123.1)**
   PMC 123.1 Budget Justification File
   You must justify the costs proposed in each Object Class Category/Cost Classification category using the PMC 123.1 Budget Justification File. The total project cost, including cost share and Federal funding, must be represented in this document. Save the budget justification information in a single file titled "ControlNumber_LeadOrganization_Budget."

7. **Letters of Commitment**
If cost share is required, you must have a letter from each third party contributing cost share (i.e., a party other than the organization submitting the application) stating that the third party is committed to providing a specific minimum dollar amount of cost share. **All Letters of Commitment must be attached as an Appendix to the Project Narrative File.** 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.

Topic Area 1 applications: A Letter of Commitment from a refinery partner is encouraged but not required.

Topic Area 2 applications: A Letter of Commitment from a refinery partner is required.

8. **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 (whichever is less). The SF424A provides columns for each individual budget-year as well as the cumulative project-budget. The total project cost, including cost share and Federal funding, must be represented in this document. Use the SF 424 A Excel for Non Construction Programs. This form is found on the DOE Financial Assistance Forms Page at http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms. Save each Subaward budget in a single file titled "ControlNumber_LeadOrganization_Subawardee_SF424A."

A PMC 123.1 Budget Justification file for the subaward budget is also required. The budget justification must include the same justification information described in Paragraph 6 above. Save each Subaward budget justification in a single file titled "ControlNumber_Subawardee_Budget."

9. **Budget for DOE Federally Funded Research and Development Center (FFRDC) Contractor File, if applicable**
If a DOE FFRDC contractor is to perform any portion of the work, you must provide a DOE Field Work Proposal (FWP) in accordance with the requirements in DOE Order 412.1 Work Authorization System. The DOE Order 412.1, Work Authorization System and the DOE O 412.1, Field Work Proposal form are available at the following link, under "DOE Budget Forms": http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms. Save the Field Work Proposal in a single file titled "ControlNumber_LeadOrganization_FFRDC_FWP."

10. Authorization for non-DOE or DOE FFRDCs

Save the Authorization for non-DOE or DOE FFRDCs, as specified in Section III.C. Other Eligibility Requirements, in a single file titled "ControlNumber_LeadOrganization_FFRDC"

11. Environmental Questionnaire

You must complete the environmental questionnaire (EF-1 and PMC111.1). Do not submit the form online through the EERE Project Management Center website; it will not be reviewed as part of the application. Save the questionnaire in a single file titled "ControlNumber_LeadOrganization_Env."

12. Project Management Plan

This plan should identify the activities/tasks to be performed, a time schedule for the accomplishment of the activities/tasks, the spending plan associated with the activities/tasks, the resources to be allocated to each task, and the expected dates for the release of outcomes. Applicants may use their own project management system to provide this information. This plan should identify any decision points and go/no-go decision criteria. Successful applicants must use this plan to report schedule and budget variances. The project management plan must not exceed 5 pages per application when printed using standard 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right), single spaced. EVALUATORS WILL REVIEW ONLY THE FIRST 5 PAGES OF THE SUBMITTED PROJECT MANAGEMENT PLAN, ASSPECIFIED IN THE PRECEDING SENTENCE. The font must not be smaller than 11 point. Do not include any Internet addresses (URLs) that provide information necessary to review the application. Save this plan in a single file titled "ControlNumber_LeadOrganization_PMP."

13. SF-LLL Disclosure of Lobbying Activities

If applicable, complete the 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." If applicable, save the SF-LLL in a single file titled "ControlNumber_LeadOrganization_SF LLL."

14. Technical and Financial Data Spreadsheet

Complete the template, which can be found on the 'FOA Documents' section of the FOA posting on the EERE Exchange website. There are two 'tabs' in the spreadsheet, both are required. The 'Process Technology' (Applicants proposing upgrading of algal oils should complete the 'Process Tech-Algae' tab) and 'Process Analytics' sections must both be completed. Save the Technical and Financial Data spreadsheet in a single file titled "ControlNumber_ LeadOrganization_TechFin".

Summary of Required Forms/Files

Your application must include the following documents:

Name of Document	Format	File Name
SF 424 - Application for Federal Assistance	Part of Adobe Application Package	ControlNumber_LeadOrganization_App424
Project Summary/Abstract File	PDF	ControlNumber_LeadOrganization_Summary
Project Narrative File, including required appendices	PDF	ControlNumber_LeadOrganization_Project
Resume File	PDF	ControlNumber_LeadOrganization_Resume
SF 424A Excel – Budget Information for Non-Construction Programs File	Excel	ControlNumber_LeadOrganization_SF424A
PMC 123.1 Budget Justification File	Excel	ControlNumber_LeadOrganization_Budget
Subaward Budget File(s), if applicable PMC 123.1 Budget Justification(s), if applicable	Excel	ControlNumber_LeadOrganization_Subawardee_SF424A ControlNumber_Subawardee_Budget
Budget for Federally Funded Research and Development Center (FFRDC) Contractor File, if applicable.	PDF	ControlNumber_LeadOrganization_FFRDC_FWP
Authorization from cognizant Contracting Officer for FFRDC, if applicable.	PDF	ControlNumber_LeadOrganization_FFRDC
Environmental Questionnaire including both the EF-1 and PMC111.1	PDF	ControlNumber_LeadOrganization_Env
Project Management Plan	PDF	ControlNumber_LeadOrganization_PMP
SF-LLL Disclosure of Lobbying Activities, if applicable	PDF	ControlNumber_LeadOrganization_SF LLL
Technical and Financial Data	Excel	ControlNumber_LeadOrganization_TechFin

D. Submissions from Successful Applicants

If selected for 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
- Commitment Letter from Third Parties Contributing to Cost Share, if applicable
- Name and phone number of the Designated Responsible Employee for complying with national policies prohibiting discrimination (See 10 CFR 1040.5)
- Representation of Limited Rights Data and Restricted Software, if applicable
- Environmental Questionnaire

E. Submission Dates and Times

1. Letter of Intent Due Date

a. Letters of intent must be received by May 1, 2012, not later than **5:00 PM Eastern Time**. You are encouraged to transmit the Letter of Intent well before the deadline. **LETTERS OF INTENT MUST BE SUBMITTED VIA EERE EXCHANGE AT** https://eere-exchange.energy.gov/. Applicants must submit a Letter of Intent by the due date to be eligible to submit an Application.

2. Pre-application Due Date

Pre-applications Are Not Required

3. Application Due Date

a. **Application Due Date and Submission Time**
b. Applications must be received by May 29, 2012, not later than **5:00 PM Eastern Time**. You are encouraged to transmit your application well before the deadline. **APPLICATIONS RECEIVED AFTER THE DEADLINE WILL NOT BE REVIEWED OR CONSIDERED FOR AWARD.**

F. Intergovernmental Review

Program Not Subject to Executive Order 12372

- 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: 2 CFR 220 for Educational Institutions; 2 CFR 225 for State, Local, and Indian Tribal Governments; 2 CFR 230 for Non Profit Organizations and FAR Part 31 for commercial organizations.

Pre-award Costs**.** Recipients may charge to an award resulting from this announcement pre-award costs that were incurred within the ninety (90) calendar day period immediately

preceding the effective date of the award and no earlier than the selection date, if the costs are allowable in accordance with the applicable Federal cost principles referenced in 10 CFR part 600. Recipients must obtain the prior approval of the Contracting Officer for any pre-award costs that are for periods greater than this 90 day calendar period.

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.

If recipients are State or Local Governments, they may not incur pre-award costs prior to award, without prior approval of the DOE Contracting Officer.

H. Submission and Registration Requirements

1. Where to Submit

LETTERS OF INTENT AND APPLICATIONS MUST BE SUBMITTED UNDER THIS ANNOUNCEMENT THROUGH EERE EXCHANGE at https://eere-exchange.energy.gov/ TO BE CONSIDERED FOR AWARD. You cannot submit a Letter of Intent or an application through EERE Exchange unless you are registered. Please read the registration requirements below carefully and start the process immediately. Letters of Intent or Applications submitted by any other means will not be accepted.

If you have problems completing the registration process or submitting your application, send an email to the EERE Exchange helpdesk at EERE-ExchangeSupport@hq.doe.gov. It is the responsibility of the applicant to verify successful transmission, prior to the Application due date and time.

2. Registration Process Requirements

There are several one-time actions that must be completed before submitting an Application in response to this Funding Opportunity Announcement (FOA), as follows:

- Register and create an account on EERE Exchange at: https://eere-exchange.energy.gov/. This account will then allow the user to register for any open EERE FOAs that are currently in Exchange. It is recommended that each organization or business unit, whether acting as a team or a single entity, use only one account as the appropriate contact point for each submission.

  The applicant will receive an automated response when the Letter of Intent or Application is received. This will serve as a confirmation of receipt. Please do not reply to the automated response. The applicant will have the opportunity to re-submit a revised Letter of Intent or Application for any reason as long as the relevant submission is submitted by the specified deadline. The Users' Guide for Applying to the Department of Energy EERE Funding Opportunity Announcements is found at https://eere-exchange.energy.gov/Manuals.aspx.

The EERE Exchange registration does not have a delay; however, the remaining **registration requirements below could take several weeks to process and are necessary in order for a potential applicant to receive an award under this announcement**. Therefore, although not required in order to submit a Letter of Intent or Application through the EERE Exchange site, **all potential applicants lacking a DUNS number, or not yet registered with CCR or FedConnect should complete those registrations as soon as possible**.
Questions related to the registration process and use of the EERE Exchange website should be submitted to: EERE-ExchangeSupport@hq.doe.gov.

- Obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number (including plus 4 extension, if applicable) at http://fedgov.dnb.com/webform.

- Register with the Central Contractor Registry (CCR) at: https://www.bpn.gov/ccr/default.aspx. Designating an Electronic Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in CCR registration. Please update your CCR registration annually.

- Register in FedConnect at https://www.fedconnect.net/. To create an organization account, your organization's CCR MPIN is required. For more information about the CCR MPIN or other registration requirements, review the FedConnect Ready, Set, Go! Guide at https://www.fedconnect.net/FedConnect/PublicPages/FedConnect_Ready_Set_Go.pdf.

- Register in Grants.gov to receive automatic updates when Amendments to this FOA are posted. However, please note that applications will not be accepted through Grants.gov. http://www.grants.gov/.

3. Electronic Authorization of Applications and Award Documents

Submission of an application and supplemental information under this announcement through electronic systems used by the Department of Energy, including EERE Exchange, constitutes the authorized representative's approval and electronic signature.

Submission of award documents, including modifications, through electronic systems used by the Department of Energy, including FedConnect, constitutes the authorized representative's approval and acceptance of the terms and conditions of the award. Award acknowledgement via FedConnect constitutes the authorized representative's electronic signature.

SECTION V - APPLICATION REVIEW INFORMATION

A. Criteria

1. Initial Review Criteria

Application Award Eligibility

- Prior to a comprehensive merit evaluation, DOE will perform an initial review to determine that (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 may be deemed non-responsive and eliminated from full Merit Review.

2. Merit Review Criteria

Applications will be evaluated against the merit review criteria shown below.

Criterion 1: Technical Merit and Work Plan Rationale (45%)

Extent to which the application convincingly demonstrates the technical merit and provides a credible approach for the proposed project by:

- Demonstrating the relevance of the proposed effort to the technical objectives of the FOA;
- Presenting a technically feasible pathway for producing a bio-oil feedstock that can be integrated into an existing petroleum refinery;
- Presenting a convincing and supportable technical baseline based on evidence of previous work, experimental results (including experimental data, if applicable), and/or the application of sound scientific principles to substantiate the proposed effort;
- Clearly defining R&D barriers, achievable technical targets, and meaningful project deliverables (including a techno-economic analysis and life cycle assessment);
- Proposing a sensible work plan that can be implemented within the project's cost and schedule and that is responsive to the objectives of the selected topic area;
- Presenting clear, reasonable, and timely milestones and go/no-go decision points (if applicable) in the resource loaded schedule;
- Sufficiently identifying the key technical risk areas and mitigation strategies to address them; and
- Demonstrating technical and economic advantages of the proposed technology to achieve the objectives of this FOA.

Criterion 2: Commercialization Strategy and Regulatory Factors (20%)

For Topic Area 1 this will likely be more conceptual in nature, whereas, for Topic Area 2, the responses should be more robust and coordinated with the refinery partner. Extent to which the application convincingly presents and justifies the commercialization strategy and a plan to address the market barriers and regulatory requirements for the proposed project by:

- Demonstrating the ability to meet the definition of a high-impact feedstock;
- Adequately addressing all environmental, health and safety, permitting, and regulatory compliance concerns;
- Presenting a credible LCA with GHG emissions for the production of transportation fuels that meets the definition of an advanced biofuel;
- Presenting a reasonable approach to accounting for RIN credits and obtaining EPA acceptance;
- Demonstrating the applicant's rights to use the technology with respect to secured or licensed intellectual property rights;
- Signifying an ability and willingness to license or otherwise replicate the resulting technology;
- Establishing the market potential in terms of the ability of the proposed process to be replicated to multiple refineries; and
- Supporting the industry's capacity to meet the EISA RFS volumetric requirement.

Criterion 3: Applicant Roles and Capabilities (35%)
Extent to which the applicant has convincingly:

- identified all key partnerships such as industrial, academic, and national laboratories involved in implementing the project and the core competencies covered by each participating organization to cover all project aspects;
- secured adequate facilities and equipment to accommodate the proposed project;
- demonstrated the reasonableness of any request for modification of facilities or new equipment;
- demonstrated the analytical capabilities available to qualitatively and quantitatively characterize relevant process streams;
- demonstrated the ability to integrate project management practices with their financial and business systems to measure project progress and enhance the probability of successful completion; and
- For Topic Area 2 only: previously engaged the refinery partner in the definition and development of the technology, including any commercialization efforts.

3. Other Selection Factors

Program Policy Factors

The selection official may consider the following program policy factors in the selection process:

- Geographic diversity of projects
- Technological diversity of projects within the Office of the Biomass Program's portfolio and goals
- Cost share offered above the minimum amount required

B. Review and Selection Process

1. Merit Review

Applications Subject to Merit Review

Applications that pass the initial 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 available at: http://energy.gov/sites/prod/files/meritrev.pdf.

It is very important that the Project Abstract and Project Narrative file used during the Merit Review Process do not contain any Personally Identifiable Information as described in Appendix B.

2. Selection

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

Additionally, the Selection Official may request that a budget evaluation (not point scored) to be conducted after the consensus review meeting on the most highly rated application(s). The budget evaluation serves to provide the Selection Official and management personnel with an understanding of the annual funding requirements for the suite of potential awards, as well as cost realism of the budget estimate, appropriateness and reasonableness of resources, and reasonableness and feasibility of the schedule relative to the Applicant's Statement of Project Objectives.

3. Discussions and Award

Government Discussions with Applicant

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 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 award to the applicant.

C. Anticipated Notice of Selection and Award Dates

Selection and Award Date

- DOE anticipates notifying applicants selected for award and making awards by **September 30, 2012.**

SECTION VI - AWARD ADMINISTRATION INFORMATION

A. Notice of Selection

1. Notice of Selection

Selected Applicants Notification

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

Non-selected Notification

Organizations whose applications have not been selected will be advised as promptly as possible. This notice will explain why the application was not selected.

2. Notice of Award

A Financial Assistance Award or Assistance Agreement 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; (5) National Policy Assurances To Be Incorporated As Award Terms; (6) Budget Summary; and (7) Federal Assistance Reporting Checklist, which identifies the reporting requirements.

For grants and cooperative agreements made to universities, non-profits and other entities subject to OMB Circular A-110, the Award also includes the Research Terms and Conditions and the DOE Agency Specific Requirements located at: http://www.nsf.gov/bfa/dias/policy/rtc/index.jsp.

B. Administrative and National Policy Requirements

1. Administrative Requirements

The administrative requirements for DOE grants and cooperative agreements are contained in Title 2 CFR (See: http://ecfr.gpoaccess.gov). Grants and cooperative agreements made to universities, non-profits and other entities subject to Title 2 CFR are subject to the Research Terms and Conditions located on the National Science Foundation web site at: http://www.nsf.gov/bfa/dias/policy/rtc/index.jsp.

DUNS and CCR Requirements

Additional administrative requirements for DOE grants and cooperative agreements are contained in 2 CFR, Part 25 (See: http://ecfr.gpoaccess.gov). Prime awardees must keep their data at CCR current. Subawardees at all tiers must obtain DUNS numbers and provide the DUNS to the prime awardee before the subaward can be issued.

Subaward and Executive Reporting

Additional administrative requirements necessary for DOE grants and cooperative

agreements to comply with the Federal Funding and Transparency Act of 2006 (FFATA) are contained in 2 CFR, Part 170. (See: http://ecfr.gpoaccess.gov). Prime awardees must register with the new FSRS database and report the required data on their first tier subawardees. Prime awardees must report the executive compensation for their own executives as part of their registration profile in the CCR.

2. Special Terms and Conditions, National Policy Requirements, and Applicant Certifications

The DOE Special Terms and Conditions for Use in Most Grants and Cooperative Agreements are located at: http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms.

The National Policy Assurances To Be Incorporated as Award Terms are located at http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms

By submitting an application in response to this FOA the Applicant certifies that:

(1) It is **not** a corporation that has been convicted (or had an officer or agent of such corporation acting on behalf of the corporation convicted) of a felony criminal violation under any Federal law within the preceding 24 months,

(2) It is **not** a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability,

(3) If the Applicant's financial assistance application is chosen for award and the award is in excess of $1,000,000, the applicant will, by the end of the fiscal year, upgrade the efficiency of their facilities by replacing any lighting that does not meet or exceed the energy efficiency standard for incandescent light bulbs set forth in Section 325 of the Energy Policy and Conservation Act (42 U.S.C. 6295).

3. Intellectual Property Provisions

The standard DOE financial assistance intellectual property provisions applicable to the various types of recipients are located at http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms.

4. Statement of Substantial Involvement

Either a grant or cooperative agreement may be awarded under this announcement. If the award is a cooperative agreement, the DOE Specialist and DOE Project Officer will negotiate a Statement of Substantial Involvement prior to award.

C. Reporting

Reporting requirements are identified on the Federal Assistance Reporting Checklist, DOE F 4600.2, attached to the award agreement.

During the project performance period, recipients will be required to periodically provide updated Technical and Financial Data spreadsheets, Project Management Plans, and also participate in DOE Peer Reviews.

SECTION VII - QUESTIONS/AGENCY CONTACTS

A. Questions

Questions regarding the content of this announcement must be submitted to: EE0000686@go.doe.gov no later than five (5) business days prior to the application due date.

All questions and answers related to this FOA will be posted on EERE Exchange at: https://eere-exchange.energy.gov/. Please note that you must first select this specific FOA Number in order to view and the questions and answers specific to this FOA. DOE will attempt to respond to a question within 3 business days, unless a similar question and answer has already been posted on the website.

Questions related to the registration process and use of the EERE Exchange website should be submitted to: EERE-ExchangeSupport@hq.doe.gov

SECTION VIII - OTHER INFORMATION

A. Amendments

Amendments to this announcement will be posted on the EERE eXCHANGE web site and the Grants.gov system. However, you will only receive an email when an amendment or an announcement is posted on these sites if you register for email notifications for this FOA in Grants.gov. DOE recommends that you register as soon after the release of the FOA as possible to ensure you receive timely notice of any amendments 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 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 other than the Contracting Officer, either explicit or implied, is invalid.

D. Proprietary Application Information

DOE will use data and other information contained in applications strictly for evaluation purposes. Applicants should not include confidential, proprietary, or privileged information in their applications unless such information is necessary to convey an understanding of the proposed project.

Applications containing confidential, proprietary, or privileged information must be marked as described below. Failure to comply with these marking requirements may result in the disclosure of the unmarked information under the Freedom of Information Act or otherwise. The U.S. Government is not liable for the disclosure or use of unmarked information, and may use or disclose such information for any purpose.

The cover sheet of the application must be marked as follows and identify the specific pages containing confidential, proprietary, or privileged information:

Notice of Restriction on Disclosure and Use of Data:
Pages *[list applicable pages]* of this document may contain confidential, proprietary, or privileged information that is exempt from public disclosure. Such information shall be used or disclosed only for evaluation purposes or in accordance with a financial assistance or loan agreement between the submitter and the Government. The Government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source.

The header and footer of every page that contains confidential, proprietary, or privileged information must be marked as follows: "Contains Confidential, Proprietary, or Privileged Information Exempt from Public Disclosure."
In addition, every line and paragraph containing proprietary, privileged, or trade secret information must be clearly marked with double brackets or highlighting.

E. Evaluation and Administration by Non-Federal Personnel

In conducting the merit review evaluation, the Government may seek the advice of qualified non-Federal personnel as reviewers. The Government may 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 date of its development, of first-produced data that would be trade secret, or commercial or financial information that is privileged or confidential, if the 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), will 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 may also identify data that will be recognized by the parties as protected data. For National Laboratories and FFRDCs, the data rights clause in Applicant's Management and Operating (M&O) Contract will apply.

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 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 award.

REFERENCE MATERIAL

Appendix A – Definitions

"Acceptable Bio-Oil Feedstock" means the biomass or algae derived oil that meets the physical and chemical requirements at the identified insertion points as defined by the refinery partner for further processing to final fuels and co-products in an existing refinery.

"Advanced Biofuels", as defined in the Energy Independence and Security Act of 2007, Section 201 (See Appendix G), means a renewable fuel, other than ethanol derived from corn starch, that has lifecycle greenhouse gas emissions…that are at least 50 percent less than baseline lifecycle greenhouse gas emissions.

"Algal Biomass" means biomass from cyanobacteria, microalgae, and macroalgae. Algal biomass from heterotrophic algae must be grown using a high-impact biomass-derived feedstock to qualify.

"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.

"Authorized Organization Representative (AOR)" is the person with assigned privileges who is authorized to submit grant 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 Applicant is selected, which contains the negotiated terms and conditions for providing Financial Assistance to the Applicant. A Financial Assistance Award may be either a Grant or a Cooperative Agreement.

"Baseline Bio-oil Feedstock" means the biomass or algae derived oil that can be produced at the time of application and is based on proven, technical achievements.

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

"Central Contractor Registration (CCR)" is the primary database which collects, validates, stores and disseminates data in support of agency missions.

"**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 Sharing**" 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.

"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.

"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

"EERE Exchange" is the Department of Energy, Energy Efficiency and Renewable Energy's web system for posting Federal Funding Opportunity Announcements and receiving applications.
https://eere-exchange.energy.gov/FileContent.aspx?FileID=e10b8886-1826-447d-b1bf-8d9f0bf06f8e

"**Financial Assistance**" means the transfer of money or property to an Applicant or Participant to accomplish a public purpose of support authorized by Federal statute through Grants or Cooperative Agreements 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.

"FedConnect" is where federal agencies make awards via the web.
https://www.fedconnect.net/FedConnect/

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

"Funding Opportunity Announcement (FOA)" is a publicly available document by which a Federal agency makes known its intentions to award discretionary grants or cooperative agreements, 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 grant 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 50 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.

"Insertion points" means any point after vacuum or atmospheric distillation within the refinery where a feedstock can be inserted for additional processing.

"**Key Personnel**" mean 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.

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

"**Project**" means the set of activities described in an Application, State plan, or other document 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 to describe 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 toward 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.

"Technical Baseline" means the proven, technical achievements for all key unit operations to produce a baseline bio-oil at the time of the application. The work proposed under this funding opportunity is intended to improve the baseline bio-oil to make a bio-oil feedstock.

"**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.

"Tribal Energy Resource Development Organization" 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.

Appendix B – 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, 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.

a. **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.

b. **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 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.

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: 2 CFR 220 Cost Principles for Educational Institutions

(ii) *Other nonprofit organizations.* Allowability is determined in accordance with: 2 CFR 230 Cost Principles for Nonprofit Organizations

(iii) *Hospitals.* Allowability is determined in accordance with the provisions of: Title 45 Appendix E to Part 74—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: PART 225—Cost Principles for State, Local, and Indian Tribal Governments (OMB Circular A–87)

(v) Commercial Organizations. Allowability is determined in accordance with: FAR Subpart 31.2—Contracts with Commercial Organizations

(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.

SAMPLE COST SHARE CALCULATION
FOR BLENDED COST SHARE PERCENTAGE

The following example shows the math for calculating required cost share for a project with $2,000,000 in Federal funds with four tasks requiring different Non-federal cost share percentages:

Task	Proposed Federal Share	Required Federal Share %	Non-federal Cost Share %
Task 1 (R&D)	$1,000,000	80%	20%
Task 2 (R&D)	500,000	80%	20%
Task 3 (Demonstration)	400,000	50%	50%
Task 4 (Outreach)	100,000	100%	0%
	$2,000,000		

Federal share ($) divided by Federal share (%) = Task Cost

Each task must be calculated individually as follows:

Task 1
$1,000,000 divided by 80% = $1,250,000 (Task 1 Cost)
Task 1 Cost minus federal share = Non-federal share
$1,250,000 - $1,000,000 = **$250,000 (Non-federal share)**

Task 2
$500,000 divided 80% = $625,000 (Task 2 Cost)
Task 2 Cost minus federal share = Non-federal share
$625,000 - $500,000 = **$125,000 (Non-federal share)**

Task 3
$400,000 / 50% = $800,000 (Task 3 Cost)
Task 3 Cost minus federal share = Non-federal share
$800,000 - $400,000 = **$400,000 (Non-federal share)**

Task 4
Federal share = $100,000
Non-federal cost share is not mandated for outreach = **$0 (Non-federal share)**

The calculation may then be completed as follows:

Task	Proposed Federal Share	Federal Share %	Required Non-federal Cost Share $	Required Non-federal Cost Share %	Total Project Cost
Task 1	$1,000,000	80%	$250,000	20%	$1,250,000
Task 2	500,000	80%	125,000	20%	625,000
Task 3	400,000	50%	400,000	50%	800,000
Task 4	100,000	100%	0	0%	100,000
	$2,000,000		$775,000		$2,775,000

Blended Cost Share %
Non-federal share ($775,000) divided by Total Project Cost ($2,775,000) = 27.9% (Non-federal)
Federal share ($2,000,000) divided by Total Project Cost ($2,775,000) = 72.1% (Federal)

Appendix D - Pyrolysis R&D Technical Barriers

Overarching R&D Challenges

- There is no standard definition of what constitutes an acceptable bio-oil feedstock product. This includes physical properties (density, viscosity, etc.) as well as chemical properties (hydrocarbon range, stability, etc.). The current slate of intermediates depends strongly on both the feedstock and process.
- The community lacks a clear understanding of the tradeoff between optimizing yield and product quality. This partially stems from the lack of a clear definition of what constitutes product quality.
- The fundamental thermochemical mechanisms of biomass decomposition are not well understood. Thorough characterization of process streams (including the product) is difficult.
- Current biomass catalysts have a short lifespan and are prone to deactivation by impurities. Catalyst stability and selectivity are problematic.
- Solvent recovery and recycle is difficult (and expensive) in many liquefaction processes. Better technologies are needed to improve cost-competitiveness; wastewater treatment suffers from similar challenges.
- Process sustainability and economics are strongly influenced by the amount of hydrogen that is needed to simultaneously achieve high carbon yields and low GHG emissions. Low-cost, non-fossil hydrogen sources are needed.

Overarching R&D Needs

- Process modeling with comprehensive techno-economic analyses to guide the selection of feasible intermediate products. Clearly defined properties and insertion points for intermediate products.
- Better analytical techniques to characterize oxygenated hydrocarbon mixtures. In situ, non-intrusive analyses are of particular interest and can improve process monitoring and control.
- A database of well-defined "benchmark" processes, feeds, and catalysts to provide a common measure to compare emerging technologies.
- Biomass-specific heat and mass transfer correlations for common reactor systems.
- Innovative processes for oxygen removal, including catalytic and electrochemical routes that limit the production of CO_X species.
- Parametric testing to evaluate catalyst performance using real biomass feedstocks, as synthetic feeds are not sufficiently representative for large-scale process design.
- Pilot-scale R&D operations to study integrated heat transfer, internal recycle (e.g., solvent and dense-phase recovery), and continuous runs; evaluation of product quality and contaminant buildup over long-term testing.

Barriers in Catalysis

- Effectively designing catalysts for long term upgrading.
- Understanding the mechanistic basis for catalyst fouling and deactivation.
- Developing protocols and operating parameters for suitable upgrading / hydroprocessing catalysts in the presence of destabilizing components and contaminants.
- Developing poison and corrosion tolerant catalysts that can achieve high levels of deoxygenation while maintaining high carbon yields.

- Demonstrating techniques/methodologies for >1000 hours continuous operation on a catalyst.
- Developing effective catalysts that combine both chemical activity and mechanical strength (attrition resistant, highly active catalyst development).
- Understanding vapor phase interaction of organic compounds with catalysts, especially oxygenated species.
- Optimizing carbon distribution for C10-C18 length molecules.
- Developing multi-functional heterogeneous catalysts to balance hydrodeoxygenation, decarboxylation, and decarbonylation pathways for minimizing oxygenate and water production while increasing carbon efficiency.

Barriers in Separations

- Designing holistic trace contaminant removal process technology (P, Si, Cl, metals and other inorganics).
- Comparing and contrasting separation technologies (fractionation, solvent extraction, etc.) in terms of a cost benefit analysis for specific liquefaction processes and technologies.
- Optimizing char removal filters and membranes.
- Determining the effect of bio-oil chemical properties on membranes (particle fouling, acidic nature) for improved vapor and liquid separations.
- Staged condensation of bio-oil fractions.
- Upfront removal of volatile (vapor) mineral compounds along with entrained char.
- Understanding relative heating/cooling rates vs. temperature impact on product distributions.
- Improving hot gas particulate filtration without severely decreasing vapor phase carbon yield.
- Defining char particle size distributions and the effects on cyclone efficiency.
- Agglomeration or flocculation of entrained particles.
- Characterizing the impact of residence time in hot gas filtration.
- Understanding the reactivity of char/filter material on vapor phase chemistry.
- Vapor phase separation of water from desired bio-oil components.

Barriers in Process Integration and Analysis

- Establishing minimum requirements for acceptable refinery inputs at specific points of integration (increasing involvement and collaboration with the off take partners).
- Generating extensive techno-economic data on thermochemical biomass liquefaction processes for targeted refinery off take (a lack of robust data to convince refineries that bio-oil is compatible with their infrastructure).
- Defining quality traits for a suite of refineries and refinery insertion points.
- Analyzing the impact of finished fuels on the prospect for ASTM certification.
- Generating a database of bio-oil chemical composition based on such variables as feedstock, type of process and process conditions.
- Evaluating applicability of petroleum standards for bio-oils, and modifying where needed (e.g., CCR (Continuous Catalytic Regeneration), Simulated Distillation, Boiling ranges, TAN (Total Acid Number), oxygen content, oxygen functionality, phenolics, aromatics, cetane).
- Determine what specifications of the end products are performance related and what specifications are flexible (i.e., does composition matter so long as the fuel meets the performance specifications in the engine testing).
- Petroleum refining processes are not optimized for hydrocarbon liquids with high oxygen content, like bio-oils (optimizing carbon efficiency during bio-oil deoxygenation).

Appendix E – Technology Readiness Levels

Identifier	***Description***	***Example***	***Output***
TRL-1	**Basic principles observed and reported:** This is lowest level of technology readiness. Scientific research begins with a systematic study directed toward greater knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications or products in mind. The knowledge or understanding will later be translated into applied research and development.	An example might include studies of a technology's basic properties.	Published papers, new innovations
TRL-2	**Technology concept and/or application formulated:** Invention begins. Once basic principles are observed, practical applications can be invented. Applications are speculative and there may be no proof or detailed analysis to support the assumptions. Practical application invented. Research to improve feasibility.	Examples are still limited to analytical studies.	Published papers, patents, preliminary investigation
TRL-3	**Analytical and experimental critical function and/or characteristic proof of concept:** Active research and development is initiated. This includes analytical studies and laboratory studies to physically validate analytical predictions of separate elements of the technology.	Examples include components that are not yet integrated or representative.	Patents, prototypes of various unit operations built
TRL-4	**Component and/or breadboard validation in laboratory environment:** Basic technological components are integrated to establish that they will work together. This is relatively "low fidelity" compared to the eventual system.	Examples include integration of "ad hoc" hardware in the laboratory.	Patents, integrated prototypes, informs engineering scale designs, possible application of Stage Gate Processing.
TRL-5	**Component and/or breadboard validation in relevant environment:** Fidelity of breadboard technology increases significantly. The basic technological components are integrated with reasonably realistic supporting elements so it can be tested in a simulated environment.	Examples include "high fidelity" laboratory integration of components.	Integrated prototypes at bench scale, informs pilot plant designs, IP owned or licensed, initiation of Stage Gate Process/tracking.
TRL-6	**System/subsystem model or prototype demonstration in a relevant environment:** Representative model or prototype system, which is well beyond that of TRL-5, is tested in a relevant environment. This represents a major step up in a technology's demonstrated readiness.	Examples include testing a prototype in a high-fidelity laboratory environment or in simulated operational environment.	Integrated prototypes at pilot scale, informs demonstration scale designs. Progress through the Stage Gate Process.
TRL-7	**System prototype demonstration in a operational environment:** This represents a major step up from TRL-6. It requires the demonstration of an actual system prototype in an operational environment, such as in a light duty vehicle on the road.	Examples include testing at demonstration scale in simulated operational environment.	Integrated prototypes at the demonstration scale, informs commercial scale designs.

TRL-8	**Actual system completed and qualified through test and Demonstration:** Technology has been proven to work in its final form and under expected conditions. In almost all cases, this TRL-8 represents the end of true system development.	Examples include developmental test and evaluation of the system in its intended parent system to determine if it meets design specifications.	
TRL-9	**Actual system proven through successful mission operations:** The technology is applied and operated in its final form and under real life conditions, such as those encountered in operational test and evaluation. In almost all cases, this is the end of the last "bug fixing" aspects of true system development.	Examples include using the system under various real life conditions.	Integrated prototypes at the commercial scale. Operational procedures that are nearly complete.

Definitions:

BREADBOARD: Integrated components that provide a representation of a system/subsystem and that can be used to determine concept feasibility and to develop technical data. These tools are typically configured for laboratory use to demonstrate technical principles of immediate interest. These may resemble final system/subsystem in function only.

"HIGH FIDELITY": Addresses form, fit and function. High-fidelity laboratory environment would involve testing with equipment that can simulate and validate all system specifications within a laboratory setting.

"LOW FIDELITY": A representative of the component or system that has limited ability to provide anything but first order information about the end product. Low fidelity assessments are used to provide trend analysis.

MODEL: A functional form of a system generally reduced in scale, near or at operational specification. Models will be sufficiently developed to allow demonstration of the technical and operational capabilities required of the final system.

OPERATIONAL ENVIRONMENT: Environment that addresses all of the operational requirements and specifications required of the final system to include platform/packaging.

PROTOTYPE: The first early representation of the system that offers the expected functionality and performance expected of the final implementation. Prototypes will be sufficiently developed to allow demonstration of the technical and operational capabilities required of the final system.

RELEVANT ENVIRONMENT: Testing environment that simulates the key aspects of the operational environment.

SIMULATED OPERATIONAL ENVIRONMENTAL: Either 1) a real environment that can simulate all of the operational requirements and specifications required of the final system, or 2) a simulated environment that allows for testing of a virtual prototype; used in either case to determine whether a developmental system meets the operational requirements and specifications of the final system.

Appendix F – Statement of Project Objectives Template

STATEMENT OF PROJECT OBJECTIVES

[Recipient Name]
[Project Title]

All of the information to be included in the SOPO should be consistent with the Application upon which the award is based. The SOPO should be written for public disclosure, and, generally, the total length should not exceed 4-5 pages.

*The following items should **not** be included in the SOPO:*

- *Dollar amounts.*
- *Specific dates.*
- *Subcontractors by name. The award is with the prime and, as such, the SOPO should not reference the subcontractors.*
- *Intellectual property information or data.*

A. PROJECT OBJECTIVES

[Enter a clear and concise statement of the goals and objectives of the project as well as the expected outcomes.]

B. PROJECT SCOPE

[Include a general overview description of the project. Refer to the DOE Program or Division (for example: Hydrogen, Fuel Cells, and Infrastructure Technologies Program; Buildings and Industrial Technologies Division; etc.) objectives that the project is addressing. This section should be only 1-2 paragraphs long.]

C. TASKS TO BE PERFORMED

[For each Task and Subtask, enter 1-2 paragraphs describing the purpose, approach, and expected outcomes. Include project milestones (do not include dates), where appropriate. If applicable, the Tasks should be organized by project phases/budget periods which correspond to major project milestones or go/no-go decision points.]

Below is an example of the type of Task structure desired:

PHASE 1 (or BUDGET PERIOD 1) [TITLE OPTIONAL]

Task 1.0 [Insert Title]
[Insert Description]

Task 2.0 [Insert Title]
[Insert Description]

Subtask 2.1 [Insert Title]

[Insert Description]

Subtask 2.2 [Insert Title]
[Insert Description]

PHASE 2 (or BUDGET PERIOD 2) [TITLE OPTIONAL]

Task 3.0 [Insert Title]
[Insert Description]

Task X.0 Project Management and Reporting *(Optional paragraph, per discussion with the DOE Project Officer)*
[Include this as the last Task and number it consecutively with the other Tasks. As part or all of the Task Description, include language along the lines of: "Reports and other deliverables will be provided in accordance with the Federal Assistance Reporting Checklist following the instructions included therein." Additional deliverables (for example, hardware delivered for testing or Peer Review Meetings / Project Review Meetings) not specified in the Reporting Checklist should be included in this Task Description.]

Appendix G – EISA 2007, Relevant Sections

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.

"(VI) Butanol or other alcohols produced through the conversion of organic matter from renewable biomass.

"(VII) Other fuel derived from cellulosic biomass.

SEC. 202. RENEWABLE FUEL STANDARD.

(a) RENEWABLE FUEL PROGRAM.—Paragraph (2) of section 211(o) (42 U.S.C. 7545(o)(2)) of the Clean Air Act is amended as follows:

(1) REGULATIONS.—Clause (i) of subparagraph (A) is amended by adding the following at the end thereof: ''Not later than 1 year after the date of enactment of this sentence,the Administrator shall revise the regulations under this paragraph to ensure that transportation fuel sold or introduced into commerce in the United States (except in noncontiguous States or territories), on an annual average basis, contains at least the applicable volume of renewable fuel, advanced biofuel, cellulosic biofuel, and biomass-based diesel, determined in accordance with subparagraph (B) and, in the case of any such renewable fuel produced from new facilities that commence construction after the date of enactment of this sentence, achieves at least a 20 percent reduction in lifecycle greenhouse gas emissions compared to baseline lifecycle greenhouse gas emissions.''.

(2) APPLICABLE VOLUMES OF RENEWABLE FUEL.—Subparagraph (B) is amended to read as follows:

''(B) APPLICABLE VOLUMES.—

''(i) CALENDAR YEARS AFTER 2005.—

''(I) RENEWABLE FUEL.—For the purpose of subparagraph (A), the applicable volume of renewable fuel for the calendar years 2006 through 2022 shall be determined in accordance with the following table:

''Calendar year:	Applicable volume of renewable fuel (in billions of gallons):
2006	4.0
2007	4.7
2008	9.0
2009	11.1
2010	12.95
2011	13.95
2012	15.2
2013	16.55
2014	18.15
2015	20.5
2016	22.25
2017	24.0
2018	26.0
2019	28.0
2020	30.0
2021	33.0
2022	36.0

''(II) ADVANCED BIOFUEL.—For the purpose of subparagraph (A), of the volume of renewable fuel required under subclause (I), the applicable volume of advanced biofuel for the calendar years 2009 through 2022 shall be determined in accordance with the following table:

''Calendar year:	Applicable volume of advanced biofuel (in billions ofgallons):
2009	0.6
2010	0.95
2011	1.35
2012	2.0
2013	2.75
2014	3.75
2015	5.5
2016	7.25
2017	9.0
2018	11.0
2019	13.0
2020	15.0
2021	18.0
2022	21.0

''(III) CELLULOSIC BIOFUEL.—For the purpose of subparagraph (A), of the volume of advanced biofuel required under subclause (II), the applicable volume of cellulosic biofuel for the calendar years 2010 through 2022 shall be determined in accordance with the following table:

''Calendar year:	Applicable volume of cellulosic biofuel (in billions of gallons):
2010	0.1
2011	0.25
2012	0.5
2013	1.0
2014	1.75
2015	3.0
2016	4.25
2017	5.5
2018	7.0
2019	8.5
2020	10.5
2021	13.5
2022	16.0

''(IV) BIOMASS-BASED DIESEL.—For the purpose of subparagraph (A), of the volume of advanced biofuel required under subclause (II), the applicable volume of biomass-based diesel for the calendar years 2009 through 2012 shall be determined in accordance with the following table:

''Calendar year:	Applicable volume of biomass-based diesel (in billions of gallons):
2009	0.5
2010	0.65
2011	0.80
2012	1.0

''(ii) OTHER CALENDAR YEARS.—For the purposes of subparagraph (A), the applicable volumes of each fuel specified in the tables in clause (i) for calendar years after the calendar years specified in the tables shall be determined by the Administrator, in coordination with the Secretary of Energy and the Secretary of Agriculture, based on a review of the implementation of the program during calendar years specified in the tables, and an analysis of—

''(I) the impact of the production and use of renewable fuels on the environment, including on air quality, climate change, conversion of wetlands, ecosystems, wildlife habitat, water quality, and water supply;

''(II) the impact of renewable fuels on the energy security of the United States;

‘‘(III) the expected annual rate of future commercial production of renewable fuels, including advanced biofuels in each category (cellulosic biofuel and biomass-based diesel);

‘‘(IV) the impact of renewable fuels on the infrastructure of the United States, including deliverability of materials, goods, and products other than renewable fuel, and the sufficiency of infrastructure to deliver and use renewable fuel;

‘‘(V) the impact of the use of renewable fuels on the cost to consumers of transportation fuel and on the cost to transport goods; and

‘‘(VI) the impact of the use of renewable fuels on other factors, including job creation, the price and supply of agricultural commodities, rural economic development, and food prices.

The Administrator shall promulgate rules establishing the applicable volumes under this clause no later than 14 months before the first year for which such applicable volume will apply.

‘‘(iii) APPLICABLE VOLUME OF ADVANCED BIOFUEL.— For the purpose of making the determinations in clause (ii), for each calendar year, the applicable volume of advanced biofuel shall be at least the same percentage of the applicable volume of renewable fuel as in calendar year 2022.

‘‘(iv) APPLICABLE VOLUME OF CELLULOSIC BIOFUEL.—For the purpose of making the determinations in clause (ii), for each calendar year, the applicable volume of cellulosic biofuel established by the Administrator shall be based on the assumption that the Administrator will not need to issue a waiver for such years under paragraph (7)(D).

‘‘(v) MINIMUM APPLICABLE VOLUME OF BIOMASSBASED DIESEL.—For the purpose of making the determinations in clause (ii), the applicable volume of biomass- based diesel shall not be less than the applicable volume listed in clause (i)(IV) for calendar year 2012.’’.

(b) APPLICABLE PERCENTAGES.—Paragraph (3) of section 211(o) of the Clean Air Act (42 U.S.C. 7545(o)(3)) is amended as follows:

(1) In subparagraph (A), by striking ‘‘2011’’ and inserting ‘‘2021’’.

(2) In subparagraph (A), by striking ‘‘gasoline’’ and inserting ‘‘transportation fuel, biomass-based diesel, and cellulosic biofuel’’.

(3) In subparagraph (B), by striking ‘‘2012’’ and inserting ‘‘2021’’ in clause (i).

(4) In subparagraph (B), by striking ‘‘gasoline’’ and inserting ‘‘transportation fuel’’ in clause (ii)(II).

(c) MODIFICATION OF GREENHOUSE GAS PERCENTAGES.—Paragraph (4) of section 211(o) of the Clean Air Act (42 U.S.C. 7545(o)(4)) is amended to read as follows:

‘‘(4) MODIFICATION OF GREENHOUSE GAS REDUCTION PERCENTAGES.—

‘‘(A) IN GENERAL.—The Administrator may, in the regulations under the last sentence of paragraph (2)(A)(i), adjust the 20 percent, 50 percent, and 60 percent reductions in lifecycle greenhouse gas emissions specified in paragraphs (2)(A)(i) (relating to renewable fuel), (1)(D) (relating to biomass-based diesel), (1)(B)(i) (relating to advanced biofuel), and (1)(E) (relating to cellulosic biofuel) to a lower percentage. For the 50 and 60 percent reductions, the Administrator may make such an adjustment only if he determines that generally such reduction is not commercially feasible for fuels made

using a variety of feedstocks, technologies,and processes to meet the applicable reduction.

''(B) AMOUNT OF ADJUSTMENT.—In promulgating regulations under this paragraph, the specified 50 percent reduction in greenhouse gas emissions from advanced biofuel and in biomass-based diesel may not be reduced below 40 percent. The specified 20 percent reduction in greenhouse gas emissions from renewable fuel may not be reduced below 10 percent, and the specified 60 percent reduction in greenhouse gas emissions from cellulosic biofuel may not be reduced below 50 percent.

''(C) ADJUSTED REDUCTION LEVELS.—An adjustment under this paragraph to a percent less than the specified 20 percent greenhouse gas reduction for renewable fuel shall be the minimum possible adjustment, and the adjusted greenhouse gas reduction shall be established by the Administrator at the maximum achievable level, taking cost in consideration, for natural gas fired corn-based ethanol plants, allowing for the use of a variety of technologies and processes. An adjustment in the 50 or 60 percent greenhouse gas levels shall be the minimum possible adjustment for the fuel or fuels concerned, and the adjusted greenhouse gas reduction shall be established at the maximum achievable level, taking cost in consideration, allowing for the use of a variety of feedstocks, technologies, and processes.

''(D) 5-YEAR REVIEW.—Whenever the Administrator makes any adjustment under this paragraph, not later than 5 years thereafter he shall review and revise (based upon the same criteria and standards as required for the initial adjustment) the regulations establishing the adjusted level.

''(E) SUBSEQUENT ADJUSTMENTS.—After the Administrator has promulgated a final rule under the last sentence of paragraph (2)(A)(i) with respect to the method of determining lifecycle greenhouse gas emissions, except as provided in subparagraph (D), the Administrator may not adjust the percent greenhouse gas reduction levels unless he determines that there has been a significant change in the analytical methodology used for determining the lifecycle greenhouse gas emissions. If he makes such determination, he may adjust the 20, 50, or 60 percent reduction levels through rulemaking using the criteria and standards set forth in this paragraph.

''(F) LIMIT ON UPWARD ADJUSTMENTS.—If, under subparagraph (D) or (E), the Administrator revises a percent level adjusted as provided in subparagraphs (A), (B), and (C) to a higher percent, such higher percent may not exceed the applicable percent specified in paragraph (2)(A)(i), (1)(D), (1)(B)(i), or (1)(E).

''(G) APPLICABILITY OF ADJUSTMENTS.—If the Administrator adjusts, or revises, a percent level referred to in this paragraph or makes a change in the analytical methodology used for determining the lifecycle greenhouse gas emissions, such adjustment, revision, or change (or any combination thereof) shall only apply to renewable fuel from new facilities that commence construction after the effective date of such adjustment, revision, or change.''.

(d) CREDITS FOR ADDITIONAL RENEWABLE FUEL.—Paragraph (5) of section 211(o) of the Clean Air Act (42 U.S.C. 7545(o)(5)) is amended by adding the following new subparagraph at the end thereof:

''(E) CREDITS FOR ADDITIONAL RENEWABLE FUEL.—The Administrator may issue regulations providing: (i) for the generation of an appropriate amount of credits by any person that refines, blends, or imports additional renewable fuels specified by the Administrator; and (ii) for the use of such credits by the generator, or the transfer of all or

a portion of the credits to another person, for the purpose of complying with paragraph (2).''.

(e) WAIVERS.—

(1) IN GENERAL.—Paragraph (7)(A) of section 211(o) of the Clean Air Act (42 U.S.C. 7545(o)(7)(A)) is amended by inserting '', by any person subject to the requirements of this subsection, or by the Administrator on his own motion'' after ''one or more States'' in subparagraph (A) and by striking out ''State'' in subparagraph (B).

(2) CELLULOSIC BIOFUEL.—Paragraph (7) of section 211(o) of the Clean Air Act (42 U.S.C. 7545(o)(7)) is amended by adding the following at the end thereof:

''(D) CELLULOSIC BIOFUEL.—(i) For any calendar year for which the projected volume of cellulosic biofuel production is less than the minimum applicable volume established under paragraph (2)(B), as determined by the Administrator based on the estimate provided under paragraph (3)(A), not later than November 30 of the preceding calendar year, the Administrator shall reduce the applicable volume of cellulosic biofuel required under paragraph (2)(B) to the projected volume available during that calendar year. For any calendar year in which the Administrator makes such a reduction, the Administrator may also reduce the applicable volume of renewable fuel and advanced biofuels requirement established under paragraph (2)(B) by the same or a lesser volume.''

(ii) Whenever the Administrator reduces the minimum cellulosic biofuel volume under this subparagraph, the Administrator shall make available for sale cellulosic biofuel credits at the higher of $0.25 per gallon or the amount by which $3.00 per gallon exceeds the average wholesale price of a gallon of gasoline in the United States. Such amounts shall be adjusted for inflation by the Administrator for years after 2008.

''(iii) Eighteen months after the date of enactment of this subparagraph, the Administrator shall promulgate regulations to govern the issuance of credits under this subparagraph. The regulations shall set forth the method for determining the exact price of credits in the event of a waiver. The price of such credits shall not be changed more frequently than once each quarter. These regulations shall include such provisions, including limiting the credits' uses and useful life, as the Administrator deems appropriate to assist market liquidity and transparency, to provide appropriate certainty for regulated entities and renewable fuel producers, and to limit any potential misuse of cellulosic biofuel credits to reduce the use of other renewable fuels, and for such other purposes as the Administrator determines will help achieve the goals of this subsection. The regulations shall limit the number of cellulosic biofuel credits for any calendar year to the minimum applicable volume (as reduced under this subparagraph) of cellulosic biofuel for that year.''.

(3) BIOMASS-BASED DIESEL.—Paragraph (7) of section 211(o) of the Clean Air Act (42 U.S.C. 7545(o)(7)) is amended by adding the following at the end thereof:

''(E) BIOMASS-BASED DIESEL.—

''(i) MARKET EVALUATION.—The Administrator, in consultation with the Secretary of Energy and the Secretary of

Agriculture, shall periodically evaluate the impact of the biomass-based diesel requirements established under this paragraph on the price of diesel fuel.

''(ii) WAIVER.—If the Administrator determines that there is a significant renewable feedstock disruption or other market circumstances that would make the price of biomass-based diesel fuel increase significantly, the Administrator, in consultation with the Secretary of Energy and the Secretary of Agriculture, shall issue an order to reduce, for up to a 60-day period, the quantity of biomass-based diesel required under subparagraph (A) by an appropriate quantity that does not exceed 15 percent of the applicable annual requirement for biomass-based diesel. For any calendar year in which the Administrator makes a reduction under this subparagraph, the Administrator may also reduce the applicable volume of renewable fuel and advanced biofuels requirement established under paragraph (2)(B) by the same or a lesser volume.

''(iii) EXTENSIONS.—If the Administrator determines that the feedstock disruption or circumstances described in clause (ii) is continuing beyond the 60- day period described in clause (ii) or this clause, the Administrator, in consultation with the Secretary of Energy and the Secretary of Agriculture, may issue an order to reduce, for up to an additional 60-day period, the quantity of biomass-based diesel required under subparagraph (A) by an appropriate quantity that does not exceed an additional 15 percent of the applicable annual requirement for biomass-based diesel.

''(F) MODIFICATION OF APPLICABLE VOLUMES.—For any of the tables in paragraph (2)(B), if the Administrator waives—

''(i) at least 20 percent of the applicable volume requirement set forth in any such table for 2 consecutive years; or

''(ii) at least 50 percent of such volume requirement for a single year, the Administrator shall promulgate a rule (within 1 year after issuing such waiver) that modifies the applicable volumes set forth in the table concerned for all years following the final year to which the waiver applies, except that no such modification in applicable volumes shall be made for any year before 2016. In promulgating such a rule, the Administrator shall comply with the processes, criteria, and standards set forth in paragraph (2)(B)(ii).''.

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.