

**FINANCIAL ASSISTANCE  
ANNOUNCEMENT OF  
FUNDING OPPORTUNITY  
(SOLICITATION)**

**Biomass Research and Development Initiative  
DE-PS36-04GO94002**

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**ISSUING OFFICE:  
U.S. DEPARTMENT OF ENERGY  
in Partnership with  
U.S. DEPARTMENT OF AGRICULTURE**

<b>ISSUE DATE:</b>	<b>December 23, 2003</b>
<b>REGISTRATION FORM DUE:</b>	<b>January 16, 2004</b>
<b>PRE-APPLICATION DUE:</b>	<b>January 30, 2004</b>
<b>FULL APPLICATION DUE :</b>	<b>March 26, 2004</b>

Information regarding this solicitation is available on the Department of Energy, Industry Interactive Procurement System (IIPS) website at: <http://e-center.doe.gov> or the Biomass Research and Development Initiative website at: <http://www.bioproducts-bioenergy.gov>.

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APPENDIX A – TERMS AND DEFINITIONS

APPENDIX B – DETAILED DESCRIPTIONS OF TECHNICAL TOPIC AREAS

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APPENDIX D – REGISTRATION FORM AND COVER PAGE

## **I. Funding Opportunity Description.**

The U.S. Department of Agriculture (USDA) and the U.S. Department of Energy (DOE) jointly announce the availability of fiscal year 2004 (FY04) funds and solicit applications for financial assistance addressing research, development, and demonstration of biomass based products, bioenergy, biofuels, biopower, and related processes. This funding opportunity, herein referred to as the “solicitation,” is intended to promote greater innovation and development related to biomass, and to support Federal policy calling for greater use of biomass-based products, feedstock production, and processing and conversion.

This joint USDA/DOE solicitation for FY04 is more focused and defined than in previous years in order to assist USDA and DOE in developing a more balanced portfolio of work products under this financial assistance program. This year’s focus is on development and demonstration projects that lead to greater commercialization. Future solicitations under this initiative may emphasize similar or differing aspects of biomass research, development, and demonstration to assure that USDA and DOE continue to obtain an appropriate portfolio mix of investments. However, this solicitation is limited to Technical Topic Areas covered in this announcement.

### **1. Legislative Authority.**

Collaboration between DOE and USDA on a Biomass Research and Development Initiative is directed under various statutory authorities, primarily Titles XX through XXII of the Energy Policy Act of 1992 (PL 102-486), and also including the Biomass Research and Development Act of 2000, and as amended by Title IX of the Farm Security and Rural Investment Act of 2002 (PL 107-171) and Title II of the Healthy Forest Restoration Act of 2003 (PL 108-148).

### **2. General Information**

DOE and USDA are seeking applications to address eight specific Technical Topic Areas as set out below. The agency supporting each Topic is indicated, and Topic Areas are discussed in greater detail in Appendix B. The Topics listed here are the only eligible topic areas under this solicitation. **Each individual application must respond to only one of the eight Technical Topic Areas.** However, an applicant may submit multiple, unique applications and thus respond to multiple topics.

The Technical Topic Areas are:

- DOE-1:** Thermochemical Conversion – SynGas Cleanup & Conditioning and Pyrolytic Bio-Oils – Handling and Blending Characteristics
- DOE-2:** Thermochemical Conversion – Fundamental Breakthrough Research
- DOE-3:** Biomass – Petroleum Refinery Evaluations
- DOE-4:** Thermochemical Gasification – Kraft Black Liquor Gasification
- USDA-5:** Feedstock Development and Production
- USDA-6:** Biobased Products – Environmental and Economic Performance
- USDA-7:** Biomass Focused Forest Management Training
- USDA-8:** Incentives

### **3. Application Process**

A two-step technical evaluation process will be used for applications submitted under this solicitation. **The first step requires the applicant to submit a preliminary application (pre-**

**application) which will be evaluated based on the four criteria discussed in section IV.2.C.iii. (page 6).** As a result of this preliminary review, each applicant will either be requested to submit a full application package or be removed from further consideration for funding under this solicitation. In either case, a letter of explanation will be provided to each applicant. The second evaluation step will consist of a detailed review of all requested full application packages, based on the technical merit criteria and other selection factors discussed in section V.1.B. and V.1.C (pages 11 through 14).

#### **4. Registration**

Applicants are requested to register for this solicitation by removing pages D-2 and D-3 from Appendix D of this document and filling in the requested information. When completed, make a double-sided copy, or fold the pages together in thirds so that the DOE address shows on the outside. Please tape closed, affix proper postage, and put into the U.S. mail by January 16, 2004. Failure to submit a registration form will not negatively affect a responsive pre-application.

#### **5. Funding Considerations**

Applications received under this solicitation will be considered independently for funding from DOE and USDA. However, successful applicants will not receive funding from both DOE and USDA for the same project. An applicant may submit multiple, unique applications, and thus receive funding from each agency.

For this solicitation, a minimum non-Federal share of 20 percent of total project cost is required. Projects that include a higher level of non-Federal cost share than the required minimum will receive a higher consideration than those with minimum non-Federal cost share. Projects addressing DOE Topic Area 3, *Biomass – Petroleum Refinery Evaluations*, require a minimum non-Federal share of 20 percent of total project cost, of which the petroleum refinery company is required to provide a minimum of 10 percent of the total project costs as cost share.

For projects that receive funding from DOE and that include a Federally Funded Research and Development Center (FFRDC) as part of a consortium, the FFRDC may not receive more than 50 percent of the total DOE Federal funds requested in the application. In addition, the FFRDC will be paid directly by DOE, rather than through the prime contractor.

#### **6. Additional Background**

Complete text of the Biomass Research and Development Act of 2000 (Title III of the Agricultural Risk Protection Act of 2000, PL 106-224) and revisions to the Act, as included in Title IX of the Farm Security and Rural Investment Act of 2002 (PL 107-171), and Title II of the Healthy Forest Restoration Act of 2003 (PL 108-148) can be found at the following websites: <http://www.bioproducts-bioenergy.gov>, [http://www.usda.gov/farmland/energy\\_fb.html](http://www.usda.gov/farmland/energy_fb.html), and <http://thomas.loc.gov/cgi-bin/query/D?c108:7:./temp/~c1083afK6f>, respectively.

As an added resource, applicants may review the *Roadmap for Biomass Technologies in the United States* prepared by the Biomass Technical Advisory Committee. It can be found on the web at <http://www.bioproducts-bioenergy.gov/pdfs/FinalBiomassRoadmap.pdf>.

Appendix A of this document contains definitions of terms that are used in this solicitation.

## II. Award Information

### 1. Type of Award Instrument.

DOE and USDA anticipate awarding:

Grants,

Cooperative agreements – will be considered for DOE awards only, if DOE considers that its technical involvement will be critical to project success.

*If cooperative agreement is selected, a special award condition describing the Government's substantial involvement in the cooperative agreement is located in section VI.2.B. (pages 15 through 16).*

### 2. Estimated Funding.

DOE intends to fund up to \$10 million and USDA intends to fund up to \$12 million for proposals under this solicitation.

### 3. Maximum and Minimum Award Size.

Ceiling (i.e., the maximum amount for an individual award made under this announcement): \$2,000,000. This refers to the Federal share only, and is the maximum total award rather than an annual funding rate.

Floor (i.e., the minimum amount for an individual award made under this announcement): \$200,000. This refers to the Federal share only, and is the minimum total award rather than an annual funding rate.

### 4. Reserved – not used at this time.

### 5. Reserved – not used at this time.

### 6. Period of Performance.

DOE and USDA anticipate making awards that will run for up to 3 years.

### 7. Reserved – not used at this time.

## III. Eligibility Information

### 1. Eligible Applicants.

The primary applicant can be a private sector entity, an institution of higher education, a national laboratory, a Federal research agency, a state research agency, a non-profit organization, or a consortium of two or more of the listed entities. Consortia are encouraged in order to bring important capabilities together to best achieve the desired innovation on biomass projects. Institutions of higher education include colleges and universities beyond the secondary education level. Private sector entities include companies, corporations, farms, ranches, cooperatives, and others that compete in the marketplace. The primary applicant must be a U.S. entity.

## 2. Cost Sharing or Matching.

For all proposed projects, the applicant must contribute a cost share of at least 20 percent of the total allowable costs of the project (i.e., the sum of the recipient's allowable costs and the Federal Government's share equals the total allowable costs of the project). If the application is for DOE Topic 3, Biomass - Petroleum Refinery Evaluations, the required minimum cost share is 20 percent, of which the petroleum refinery company is required to cost-share a minimum of 10 percent of the total project costs. For projects that receive funding from DOE and that include a national laboratory as part of a consortium, the laboratory may not receive more than 50 percent of the total DOE Federal funds requested in the application. Applicant cost share contributions must come from non-Federal sources (see 10 CFR part 600 for the applicable cost sharing requirements).

## 3. Other.

### Energy Policy Act Eligibility Requirements.

Section 2306 of the Energy Policy Act of 1992 (EPACT) [42 U.S.C. 13525] imposes certain eligibility requirements on awards made under this program. In order to make an award to an applicant that is a business entity, other than a non-profit organization of the type described in section 501(c)(3) of the Internal Revenue Code of 1954, the awarding agency must determine that the applicant's participation will be in the economic interest of the United States and that the applicant is either a U.S. owned company or is incorporated or organized under the laws of any State and that its parent company is incorporated or organized under the laws of a country that affords: (1) to U.S. owned companies opportunities comparable to those afforded to any other company to participate in government-supported joint ventures in energy research and development and in local investment opportunities; and (2) adequate and effective protection for intellectual property rights of the U. S. owned companies. Eligible applicants must be able to meet these two tests (see section IV.3.C., page 10, Additional Submissions from Successful Full Applications, EPACT Representation).

The Catalog of Federal Domestic Assistance (CFDA) number for this Announcement is 81.087, Renewable Energy Research and Development.

## IV. Application and Submission Information.

### 1. Address to Request Application Package.

This announcement includes all the information needed to complete an application.

### 2. Content and Form of Application Submission.

#### A. DUNS Number.

All applicants, except individuals who would personally receive an award under this announcement apart from any business or non-profit organization they may operate, must include a Dun and Bradstreet (D&B) Data Universal Numbering System (DUNS) number in their application. For the purpose of this requirement, the applicant is the entity that meets the eligibility criteria and has the legal authority to apply for an award. For example, a consortium formed to apply for an award must obtain a DUNS number for that consortium. For assistance

in obtaining a DUNS number at no cost, call the DUNS Number request line (1-866-705-5711). Be prepared to provide the following information: 1) Organization name; 2) Address; 3) Telephone number; 4) Line of business; 5) Chief executive officer/key manager; 6) Date the organization was started; 7) Number of people employed; 8) Organization affiliation. Applicants who do not already have a DUNS number are encouraged to obtain one as soon as a decision is made to submit an application. Note that a DUNS number is not required for a pre-application.

**B. Letter of Intent.**

Applicants are requested to submit a registration form (Appendix D, page D-4) of this document) by January 16, 2004. Failure to submit a registration form will not negatively effect a responsive pre-application submitted in a timely fashion.

**C. Pre-application.**

Pre-applications are required. Specific content and submission requirements for the pre-applications are as follows:

*i. Pre-Application Submission*

*Each pre-application must be comprised of seven paper copies of the pre-application plus one electronic copy on a CD or a 3.5 inch diskette in Microsoft Word for PCs or pdf format.*

***Pre-applications must be received no later than 6:00 p.m., mountain standard time, on January 30, 2004. All applicants are requested to use an express mail service (e.g., Fed-Ex, USPS, UPS, or other) to submit their pre-applications. No hand-delivered pre-applications will be accepted.***

***Please send pre-applications to the following address:***

*U.S. Department of Energy  
Golden Field Office  
ATTN: Solicitation Coordinator; DE-PS36-04GO94002  
1617 Cole Blvd.  
Golden, CO 80401*

*ii. Pre-Application Content and Format*

*The pre-application shall consist of a cover page from Appendix D, page D-4 of this solicitation, plus no more than three additional pages when printed single-sided. All pages should be appropriately numbered, and any pages in excess of the three-page limit will be discarded. Printed copies of the pre-application must be on 8½" x 11" sheets, using a minimum 11-point font and margins of no less than ¾" on each side. Paper copies of the pre-application must be printed from the electronic file (i.e., the electronic file must match the printed document). Electronic files of the pre-application will be accepted only on a CD or a 3.5 inch diskette in Microsoft Word or pdf format. Page limitations refer to all files and associated documents, including attachments, appendicies, graphics, footnotes, endnotes, bibliography, and any other pertinent documents, when printed in their entirety. To facilitate orderly and expeditious reviews of the pre-applications, please follow the format prescribed below.*



Applicants must complete the cover page given in Appendix D, page D-4, of this document and include it in the pre-application package. It is recommended that the form be copied so that a blank form is available if the applicant is asked to submit a full application.

The pre-application text should address the major aspects of the four technical evaluation criteria given below. The pre-application shall be organized into the following sections:

1. Introduction
2. Technical Relevance and Merit
3. Technical Approach/Work Plan
4. Energy Efficiency/Displacement, Rural Economic Development, Environmental Benefits
5. Technical, Management, and Facility Capabilities

**iii. Pre-Application Evaluation Criteria**

The following technical evaluation criteria will be used to evaluate pre-applications:

<b>Criterion 1: Technical Relevance and Merit</b>	<b>Weight: 30 percent</b>
<b>Criterion 2: Technical Approach/Work Plan</b>	<b>Weight: 25 percent</b>
<b>Criterion 3: Energy Efficiency/Displacement, Rural Economic Development, Environmental Benefits</b>	<b>Weight: 20 percent</b>
<b>Criterion 4: Technical, Management, and Facility Capabilities</b>	<b>Weight: 25 percent</b>

More detailed descriptions of the technical merit criteria are given in section V.1.B. (pages 11 through 13), and applicants are encouraged to read and understand the intent of each criterion before preparing their pre-application. It is the applicant's responsibility to address each criterion as fully as possible within the 3-page limit of the pre-application.

**iv. Pre-Application Selection Process**

DOE and USDA will jointly perform the technical evaluation of all pre-applications, based on the criteria listed above. As a result of this preliminary review, each applicant will either be requested to submit a full application package or be removed from consideration for funding under this solicitation. In either case, a letter of explanation will be provided to each applicant.

**Only applicants invited to submit a full application will be considered for an award.**

There is no commitment by DOE or USDA to fund a specific number of full applications.

Applicants are encouraged to present projects that have substantial technical merit and that address the Technical Topic Areas and meet the criteria identified above.

**D. Application. FULL APPLICATION**

Full applications will be requested by DOE/USDA only from those applicants selected in the pre-application process. Only full applications that have been requested by DOE/USDA will be considered for funding under this solicitation.

**i. Full Application Submission**

Each submission must be comprised of seven paper copies of the application plus one electronic copy on a CD or a 3.5 inch diskette in Microsoft Word or as pdf files.

**Applications must be received no later than 6:00 p.m., mountain standard time, on March 26, 2004. All applicants are requested to use an express mail service (e.g., Fed-Ex, USPS, UPS, or other) to submit their applications. No hand-delivered applications will be accepted.**

**Please send full applications to the following address:**

U.S. Department of Energy  
Golden Field Office  
ATTN: Solicitation Coordinator; DE-PS36-04GO94002  
1617 Cole Blvd.  
Golden, CO 80401

## **ii. Content and Format of Full Applications**

Applications must conform to the following requirements in order to be considered for funding under this solicitation:

1. Each applicant must complete the cover page given in Appendix D, page D-4, of this solicitation and include it in the application package. The cover page will not count against the total page limitations.
2. Electronic files of applications will be accepted only in Microsoft Word or as pdf files. Printed copies of the application must be on 8½" x 11" sheets, using a minimum 11-point font and margins of no less than ¾" on each side. Paper copies of the application must be printed from the electronic file (i.e., the electronic file must match the printed document). Page limitations refer to all files and associated documents, including attachments, appendices, graphics, footnotes, endnotes, bibliography, and any other pertinent documents, when printed in their entirety (single-sided), unless otherwise indicated in this solicitation. All pages should be appropriately numbered.
3. Each full application must be made up of two component documents:
  - Volume I: Technical Proposal
  - Volume II: Cost Proposal

Specific content requirements for each of these documents are discussed below.

### **Volume I: Technical Proposal**

The Technical Proposal must include:

1. A one-page, single-sided, non-confidential technical summary that describes the work to be undertaken and the expected outcome and benefits. The technical summary should take into account the priorities and evaluation factors described in this solicitation. Pages in excess of the one-page limit will be discarded.
2. A project narrative, **not to exceed 20 pages** (single-sided) in length, that clearly and concisely describes the proposed project and discusses the expected benefits. The project narrative should provide a clear description of the work to be undertaken and how it will be accomplished. It must be formatted to address each of the merit review criteria

listed in section V.1.B. (pages 11 through 13) of this document. The project narrative should provide sufficient information for the reviewers to evaluate the application in accordance with these merit review criteria. The project narrative shall be organized into the following sections:

- Introduction
- Technical Relevance and Merit
- Technical Approach/Work Plan
- Energy Efficiency/Displacement, Rural Economic Development, Environmental Benefits
- Technical, Management, and Facility Capabilities

Pages in excess of the 20-page limit will be discarded and will not be evaluated.

3. Bibliography and references for any references cited in the technical proposal. This section must include only bibliographic citations and will be included in the page count for the technical proposal.
4. Resumes or biographical sketches for key personnel may be included. However, the resumes or biographical sketch pages will be included in the page count for the project narrative. The most important information provided should be a brief statement justifying why this individual is a good choice for involvement in the proposed project. Other information, such as education, professional positions held, publications, patents, or other activities may be included, as deemed appropriate.
5. Commitment letters from third parties contributing to cost sharing. The application must include firm funding commitment letters from third parties expected to contribute to cost sharing. The letters should be included as an attachment and will not be included in the page count for the project narrative. The following information is required for each participant providing cost sharing:
  - the name of the organization
  - the proposed dollar amount to be provided
  - the amount as a percentage of the total project cost, and the proposed cost sharing – cash services, or property.For projects with multiple cost sharing partners, summarize the information in a table format.
6. Graphics and visual material, as deemed appropriate by the applicant. All graphics and visual material should be referenced in the project narrative text, converted to pdf files and included as a separate file, named “Graphics Attachment.” Graphics and visual material, including charts, graphs, maps, photographs, and other pictorial presentations, will be included in the page count for the project narrative.

## **Volume II: Cost Proposal**

The Cost Proposal must:

1. Indicate the amount of Federal funds requested and the matching resources provided by the applicant in order to carry out the project. The cost proposal is limited to 12 pages, plus required forms. Pages in excess of the 12-page limit will be discarded.
2. Include SF 424, *Application for Federal Assistance* and supporting standard forms, SF-424A and SF-424B for non-construction programs, or SF-424C and SF-424D for construction programs. If a proposed project includes both construction and non-construction components, all four supporting forms (SF-424A, SF-424B, SF-424C, and SF

424-D) must be included. These forms are not included in the page count for the cost proposal. [Click here for SF 424 application forms.](#)

3. Provide a project budget and the applicant's request for a specific amount of Federal funds under this solicitation. The project budget should show a summary of proposed costs for each task identified in the Technical Approach/Work Plan, as well as the matching or corresponding resources devoted to this project by the applicant, including each of the participating entities in a consortium engaged to carry out the project as proposed.

The project budget should include the following for the applicant and each participant:

- Position title, number of hours and total cost for personnel proposed
- Total cost for travel
- Proposed equipment, supplies or other major expenses over \$5,000
- Total of all direct costs
- Total indirect costs
- Summary of total project costs

### iii. Full Application Award Process

As noted previously, full applications will be accepted only from applicants who have been selected in the pre-application process. All requested full application packages will be reviewed, based on criteria specified in sections V.1.B. and V.1.C. (pages 11 through 14) of this document.

Grants will be awarded competitively, based on technical merit of the proposed project, funding availability, and program policy factors. An independent panel of scientific and technical peers will perform all technical merit evaluations of pre-applications and applications, and will be overseen jointly by DOE and USDA. Following the technical merit evaluation process, DOE and USDA will independently review program policy factors (see section V.1.C., pages 13 through 14) to evaluate the relevance of the project to current and future program priorities. There is no commitment by DOE or USDA to make a specific number of awards. Applicants are encouraged to present projects that have substantial technical merit and that address the Technical Topic Areas and Other Selection Factors identified in this solicitation.

### 3. Submission Dates and Times.

#### A. Pre-application Due Date.

***Pre-applications must be received no later than 6:00 p.m., mountain standard time, on January 30, 2004. All applicants are requested to use an express mail service (e.g., Fed-Ex, USPS, UPS, or other) to submit their pre-applications. No hand-delivered pre-applications will be accepted.***

***Please send pre-applications to the following address:***

*U.S. Department of Energy  
Golden Field Office  
ATTN: Solicitation Coordinator; DE-PS36-04GO94002  
1617 Cole Blvd.  
Golden, CO 80401*

**B. Application Due Date.**

**Full applications from selected applicants must be received no later than 6:00 p.m., mountain standard time, on March 26, 2004. All applicants are requested to use an express mail service (e.g., Fed-Ex, USPS, UPS, or other) to submit their applications. No hand-delivered applications will be accepted.**

**Please send full applications to the following address:**

U.S. Department of Energy  
 Golden Field Office  
 ATTN: Solicitation Coordinator; DE-PS36-04GO94002  
 1617 Cole Blvd.  
 Golden, CO 80401

**C. Additional Submissions from Successful Full Applications.**

In addition to the full application package, applicants who have been selected for negotiation of an award must submit the information listed below not later than 30 calendars days after notification of selection. Applicants who fail to provide the information within the required time period may be eliminated from further consideration.

What to submit	Required Form or Format
<input checked="" type="checkbox"/> EPACT Representation. A successful applicant that is a business entity, other than a non-profit organization of the type described in section 501(c)(3) of the Internal Revenue Code, must complete and provide the appropriate EPACT Representation form.	Complete the appropriate EPACT Representation form.  <a href="#">Click here for form</a>
<input checked="" type="checkbox"/> If a DOE FFRDC contractor is to perform a portion of the work, provide a DOE Field Work Proposal in accordance with the requirements in DOE Order 412.1 Work Authorization System (Attachment 3 is a Sample Format for the Field Work Proposal).  DOE O 412.1 is available at <a href="http://www.directives.doe.gov/directives/current.html#number">http://www.directives.doe.gov/directives/current.html#number</a> (Click on Series 400 Work Process).	For non-DOE FFRDCs, no special form. The budget must include the same detail and cost elements, if applicable, as the recipient's budget.
<input checked="" type="checkbox"/> If selected for negotiation of an award, and applicant will be required to complete an Environmental Checklist. Do not	Complete Golden Field Office NEPA Compliance Form EF-1.

complete the checklist unless instructed to do so by DOE/USDA.	
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**4. Intergovernmental Review.**

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

**5. Funding Restrictions.**

**Cost Principles.** Cost must be allowable in accordance with the applicable cost principles referenced in 10 CFR part 600.

**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, if the costs are necessary for the conduct of the project activities and are otherwise allowable in accordance with the applicable cost principles and the terms and conditions of the award. 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. The awarding Federal agency 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.

**6. Reserved – not used at this time.**

**V. Application Review Information.**

**1. Criteria**

**A. Compliance Review Criteria.**

Prior to reviewing full applications for technical merit, DOE and USDA will perform a compliance review to determine if the application meets the following minimum requirements: (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 solicitation.

**B. Technical Merit Review Criteria.**

Full applications will be reviewed in accordance with the following process and criteria: All timely applications that fulfill the minimum application requirements, as determined by the compliance review (described in the previous paragraph) will be eligible for comprehensive evaluation.

All applications received in response to this solicitation will be reviewed by DOE and by USDA using a two-step process. The first step includes a *joint* technical evaluation using a scientific peer review process. During the technical merit review, each application will be rated with a numerical score using the following technical rating criteria:

**Criterion 1: Technical Relevance and Merit** **Weight: 30 percent**

The technical merit of the application will be evaluated based on the extent to which the project, if successfully carried out, will address research, development, and demonstration activities for biomass as described in this solicitation. Specific considerations for this criterion are:

- Clarity and relevance of the project objectives.
- Novelty, innovation, uniqueness, and originality of the project objectives.
- Technical merit of the proposed research, development, or demonstration.
- Extent to which the proposed work will demonstrate the current state of knowledge and/or technology.
- Extent to which the proposed work will complement or advance the current knowledge or technology for the stated objectives.

**Criterion 2: Technical Approach/Work Plan** **Weight: 25 percent**

The technical approach will be evaluated based on the clarity and technical strength of the approach to achieve the project objectives, including the plan for each task and subtask, milestones and deliverables. Specific considerations for this criterion are:

- Technical feasibility of the proposed work.
- Adequacy and completeness of the proposed tasks.
- Clarity and completeness of the description of each activity necessary to complete the project.
- Likelihood of achieving project objectives through realistic milestones and logical task structure.
- Reasonableness of the schedule.
- Performance measures and milestones for evaluating progress with regard to key subtasks and/or deliverables.
- Identification and appropriateness of key decision points for mitigating potential problems.
- Process for monitoring and evaluating the project's progress and performance.

**Criterion 3: Energy Efficiency/Displacement, Rural Economic Development, Environmental Benefits** **Weight: 20 percent**

The overall projected benefits will be evaluated in terms of: improvements in energy efficiency and economics of the biomass technology, oil displacement, rural economic development, and environmental benefits. Specific considerations for this criterion are:

- Estimated benefits in comparison to existing technology or system (e.g., crude oil displacement or energy efficiency gains in product production).
- Comparison of the cost to produce the targeted product(s), fuel(s), and power, versus existing best commercial technology.
- Anticipated energy and/or economic benefits, including those related to enterprise and community self-sufficiency, rural economic development, job creation, and reduction in imports.
- Potential for the proposed work to provide sufficient benefits in terms of cost reduction, risk reduction, or performance improvement to justify the cost of the system being investigated.
- Potential for near-term implementation of the proposed system or technology.
- Incorporation of activities and technologies that are protective of the environment.
- Extent to which public safety, environmental concerns, and land sustainability issues in rural areas are addressed.

**Criterion 4: Technical, Management, and Facility**

### **Capabilities**

**Weight: 25 percent**

Technical and management qualifications of all participating organizations and key personnel, including subcontractors and consultants, will be evaluated with respect to their ability to carry out the proposed effort. The adequacy and appropriateness of the facilities planned for this work will also be considered. Specific considerations for this criterion are:

- Credentials, capabilities, experience (technical and managerial), performance record, and availability of the applicant and participants to comprehensively address all aspects of the proposed project.
- Soundness of the project management concept with respect to proposed tasks and organizational structure to achieve project objectives.
- Type, quality, availability, and appropriateness of facilities, equipment, and materials utilized to carry out the proposed work.
- Level of participation by project participants as evidenced by letter(s) of commitment.
- Extent of beneficial collaboration across industry and academia.
- Current or recent government contracts, grants, cooperative agreements, or other work by the applicant and/or participants in this or related fields.

The maximum score for all of the above technical rating criteria is 100 points.

### **C. Other Selection Factors.**

As noted in section V.1.B., above, all full applications received in response to this solicitation will be reviewed by DOE and USDA using a two-step process. The first step is a technical merit review, described above, and jointly overseen by DOE and USDA. The second step is a program policy factor review, which will be conducted independently by the agency (DOE or USDA) supporting the Topic Area addressed by the application.

During the program policy factor review, each application will be evaluated against the following criteria:

#### **For Topic Areas supported by DOE, the program policy factors will include:**

- Balance of the overall portfolio of DOE investments in biomass research and development.
- Level of cost sharing above the minimum requirement.

#### **For Topic Areas supported by USDA, the program policy factors will include giving precedence to applications:**

- Emphasizing near term implementation and application to commercially viable biomass production, management, handling, processing, and manufacturing.
- Involving consortia that include Tribal entities.
- Addressing methods for biomass production, harvesting, handling, and utilization that are environmentally beneficial and cost effective.



- Exhibiting mobility and adaptability of economically viable and relatively small-scale biomass utilization technology.
- Improving rural-based processing and manufacturing of biobased products and power production from biomass, including those that demonstrate the potential to stimulate revenue streams and economic improvement in rural areas.
- Developing, diversifying, and expanding renewable biomass products systems, leading to improved self-sufficiency for rural constituencies, including farmers, ranchers, rural communities and institutions, tribes, local governments, and businesses.

## 2. Selection Process.

### A. Selection.

The Selection Official for each agency will consider the merit review recommendation, program policy factors, and the amount of funds available. Selections by each agency will be conducted under the rules and regulations of the respective agency.

### B. Discussions and Award.

USDA or DOE may require applications to be clarified or supplemented to the extent considered necessary by the agency, either through additional submissions or oral presentations. Such determination of necessity and method of clarification is solely at the discretion and judgement of the agency.

## 3. Anticipated Announcement and Award Dates.

DOE and USDA anticipate notifying applicants selected for negotiation of an award by 6/30/04 and making awards by 8/30/04

## VI. Award Administration Information.

### 1. Award Notices.

#### A. Notice of Selection.

DOE and USDA will notify applicants selected for negotiation of an award. This notice of selection is not an authorization to begin performance, nor does it guarantee that an award will be made by DOE or USDA, (see section IV.5., page 11, with respect to the allowability of pre-award costs.)

Organizations whose applications have not been selected will be advised as promptly as possible, and will be offered the opportunity for a debriefing.

#### B. Notice of Award.

A Notice of Financial Assistance Award issued by the contracting officer is the authorizing award document. It includes, either as an attachment or by reference: 1. a budget that indicates the amounts, by categories of expenses, on which the agency has based its support; 2. the application and/or a Statement of Objectives; 3. applicable program regulations, if any; 4. special terms and conditions; 5. financial assistance regulations of the awarding agency (10 CFR part 600 for DOE) or for Federal

Demonstration Partnership (FDP) institutions the FDP terms and conditions; and 6. a reporting checklist which identifies the reporting requirements.

## 2. Administrative and National Policy Requirements.

### A. Administrative and National Policy Requirements.

The administrative requirements and national policy requirements (e.g., “generally applicable requirements”) for Federal agency grants and cooperative agreements are governed by the awarding agency’s regulations (10 CFR Part 600 for DOE), except for grants made to Federal Demonstration Partnership (FDP) institutions. The FDP terms and conditions and agency specific terms and conditions are located on the National Science Foundation web site at [www.nsf.gov](http://www.nsf.gov). “Generally applicable requirements” for DOE are defined in 10 CFR 600.12.

### B. Special Terms and Conditions.

#### **Lobbying Restrictions**

Funds awarded as a result of this solicitation cannot be used for lobbying. Lobbying restrictions will be specified in the award documents for each project.

#### **Buy American Act.**

NOTICE REGARDING THE PURCHASE OF AMERICAN-MADE EQUIPMENT AND PRODUCTS -- SENSE OF CONGRESS

It is the sense of the Congress that to the greatest extent practicable all equipment and products purchased with funds made available under this award should be American-made. Regulations regarding expenditures for equipment and products will be specified in the award documents for each project.

#### **Reporting.**

Failure to comply with the reporting requirements contained in this award will be considered a material noncompliance with the terms of the award. Noncompliance may result in withholding of future payments, suspension or termination of the current award, and withholding of future awards. A willful failure to perform, a history of failure to perform, or of unsatisfactory performance of this and/or other financial assistance awards, may also result in a debarment action to preclude future awards by Federal agencies.

#### **Environmental, Safety, and Health.**

The recipient must comply with applicable Federal, state, and local environmental, safety, and health laws and regulations for work performed under this award.

#### **Notice Regarding Unallowable Costs and Lobbying Activities.**

The recipient should carefully review the allowable cost and other provisions applicable to expenditures under this award. If funds are spent for purposes or in amounts inconsistent with the allowable cost or any other provisions governing expenditures, DOE and USDA may pursue a number of remedies, including in appropriate circumstances, recovery of such funds, termination of the award, suspension or debarment, and criminal prosecution for false statements.

Particular care should be taken to comply with all statutes and regulations prohibiting the expenditure for funds for lobbying and related activities. Financial assistance awards may be used to describe and promote the understanding of scientific and

technical aspects of specific energy technologies, but not to encourage or support political activities such as the collection and dissemination of information related to potential, planned or pending legislation.

**Statement of Substantial Involvement.**

Cooperative agreements include the following features not typical of a grant: (1) substantial involvement in and contribution to the technical aspects of the effort are necessary for its accomplishment, and (2) the nature of the collaboration is clearly defined and specified in a special award condition.

**3. Reporting.**

- Specific reporting requirements will be identified by each agency in the award documents for each project.

**VII. Agency Contact(s).**

Questions regarding the content of the announcement should be submitted through the "Submit Question" feature of the DOE Industry Interactive Procurement System (IIPS) at <http://e-center.doe.gov>. Locate the solicitation on IIPS and then click on the "Submit Question" button at the top. Enter required information. An electronic notification will be sent, acknowledging that the question has been answered. DOE will try to respond to a question within 3 days, unless a similar question and answer have already been posted on the website.

Responses to questions may be viewed through the "View Questions" feature, button at the top of the page. If no questions have been answered, a statement to that effect will appear at the top of the page. "View Questions" should be checked periodically for new questions and answers.

Questions regarding how to submit questions or view responses can be e-mailed to the IIPS HELP Desk at [helpdesk@pr.doe.gov](mailto:helpdesk@pr.doe.gov) or by calling 1 (800) 683-0751.

Questions regarding this announcement may also be submitted via email to the contact listed below. Note that questions submitted by email will be posted and answered in IIPS, only.

- Mr. Pat Liles, Contract Specialist; [gobiomass@go.doe.gov](mailto:gobiomass@go.doe.gov)

**VIII. Other Information.**

**1. Modifications.**

Notices of any modifications to this announcement will be posted on the DOE Industry Interactive Procurement System (IIPS) and the Biomass Research and Development Initiative website, <http://www.bioproducts-bioenergy.gov>.

Applicants who register in IIPS may join this solicitation mailing list to receive an email when a modification or an announcement message is posted. To view modifications and announcement messages, locate the announcement on IIPS and click on the yellow folder next to the announcement number or follow the directions for "Locate Solicitation."

**2. Government Right to Reject or Negotiate.**

DOE and USDA reserve 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.

**3. 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.

**4. Proprietary Application Information.**

An application may include data including trade secrets and/or privileged or confidential commercial or financial information which the applicant does not want disclosed to the public or used for any purpose other than evaluation of the application (see 10 CFR 600.15). The use and disclosure of such data may be restricted, provided the applicant marks the cover sheet of the application with the following legend and specifies the pages of the application which are to be restricted:

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

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

“Use or disclosure of the data set forth above is subject to the restriction on the cover page of this application.”

**5. Notice Regarding Eligibility of Organizations Described in Section 501(c)(4) of the Internal Revenue Code.**

Applicant organizations that are described in section 501(c)(4) of the Internal Revenue Code of 1986 and that have engaged in any lobbying activities after December 31, 1995 are not eligible for an award. As set forth in section 3 of the Lobbying Disclosure Act of 1995, as amended, (2 U.S.C. 1602), lobbying activities are defined broadly to include, among other things, contacts on behalf of an organization with specified employees of the Executive Branch and Congress with regard to Federal legislative, regulatory, and program administrative matters.

**6. Evaluation by Non-Federal Reviewers**

In conducting the merit review evaluation, the Government may use qualified non-Federal personnel (e.g., Government management and operating contractors, university personnel, or other scientific/technical experts) as reviewers or advisors. The applicant, by submitting its application, consents to the use of non-Federal reviewers. Non-Federal reviewers will be required to sign a Conflict-of-Interest/Non-Disclosure Certificate prior to reviewing any application.

**7. 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 or USDA award. Specific regulations of each agency will be identified in the award documents for each project.

Rights in Technical Data. Normally, the Government has unlimited rights in technical data created under a Federal agency 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 the Government's own needs or to insure the commercialization of technology developed under a Federal agreement. The rights in data applicable to the various types of DOE financial assistance recipients are contained in 10 CFR 600.

Intellectual Property Provisions. Financial assistance intellectual property provisions for USDA or DOE will be specified in the award documents for each project.

**8. 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 identified inventions. Therefore, small businesses and nonprofit organizations do not need to request a waiver.

**9. 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.

**10. Participation by Federally Funded Research and Development Center Contractors.**

Federally Funded Research and Development Center (FFRDC) contractors are eligible for an award under this announcement, but if the FFRDC is proposed as a team member the FFRDC will be subject to the following guidelines:

Authorization for non-DOE FFRDCs. The Federal agency sponsoring the FFRDC 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 and must not place the FFRDC in direct competition with the private sector.

Authorization for DOE FFRDCs. The cognizant contracting officer 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 complimentary to the missions of the laboratory, will not adversely impact execution of the DOE assigned programs at the laboratory, and will not place the laboratory in direct competition with the domestic private sector.”

Value/Funding. The value of, and funding for, the FFRDC 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 entities 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:

The scope of work to be performed by the FFRDC may not be more significant than the scope of work to be performed by the applicant.

For projects that receive funding from DOE and that include a Federally Funded Research and Development Center (FFRDC) as part of a consortium, the FFRDC may not receive more than 50 percent of the total DOE Federal funds requested in the application. In addition, the FFRDC will be paid directly by DOE, rather than through the prime contractor.

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.

## APPENDIX A – DEFINITIONS

**“Agency”** means the United State Department of Agriculture, Natural Resources Conservation Service, or the United States Department of Energy, either or both acting on behalf of the Federal government.

**“Amendment”** means a revision to a solicitation.

**“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 solicitation.

**“Application”** means the documentation submitted in response to a solicitation.

**“Award”** means the written documentation executed by a Federal government grant officer or contracting officer, after an applicant is selected, which contains the terms and conditions for providing financial assistance to the applicant.

**“Biobased product”** means commercial or industrial products, other than food or feed, derived from biomass feedstocks. Many of these products possess unique properties unmatched by petroleum-based products or can replace products and materials traditionally derived from petrochemicals.

**“Bioenergy”** means useful, renewable energy produced from organic matter – the conversion of the complex carbohydrates in organic matter to energy. Organic matter may either be used directly as a fuel processed into liquids and gasses, or be a residual of processing and conversion.

**“Biofuels”** means fuels made from biomass resources, or their processing and conversion derivatives. Biofuels include ethanol, biodiesel, and methanol.

**“Biomass”** means any organic matter that is available on a renewable or recurring basis, including agricultural crops and trees, wood and wood wastes and residues, plants (including aquatic plants), grasses, residues, fibers, and animal wastes, municipal wastes, and other waste materials.

**“Biopower”** means the use of biomass feedstock to produce electric power or heat through direct combustion of the feedstock, through gasification and then combustion of the resultant gas, or through other thermal conversion processes. Power is generated with engines, turbines, fuel cells, or other equipment.

**“Budget”** means the cost expenditure plan submitted in the application, including both the Federal government contribution and the applicant cost share.

**“Consortium (plural consortia)”** means the group of organizations or individuals that have chosen to submit a single application in response to a solicitation.

**“Contracting officer or grant officer”** means the Federal government official authorized to execute awards on behalf of USDA or DOE respectively and who is responsible for the business management and non-program aspects of the grant process.

**“Cooperative agreement”** means a financial assistance instrument used by the Federal government to transfer money or property when the principal purpose of the transaction is to accomplish a public purpose of support for stimulation authorized by Federal statute, and substantial involvement is

anticipated between the government and the applicant during the performance of the contemplated activity.

**“Cost sharing”** means the respective share of total project costs required to be contributed by the applicant and by the Federal government. The required percentage of applicant cost share is to be applied to the total project cost rather than to the Federal government contribution alone.

**“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 agreement, Cooperative Research and Development Agreements (CRADAs), or any other type of financial incentive instrument.

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

**“Grant”** means a financial assistance instrument used by the Federal government to transfer money or property when the principal purpose of the transaction is to accomplish a public purpose authorized by Federal statute, and no substantial involvement is anticipated between the government and the applicant during the performance of the contemplated activity.

**“Industry Interactive Procurement System (IIPS)”** is DOE’s internet-based procurement system which allows access to DOE’s business opportunities database, <http://e-center.doe.gov/>.

**“Key personnel”** means the individuals who will have significant roles in planning and implementation of the proposed project on the part of the applicant and participants.

**“Participant”** for purposes of this solicitation only, means any entity, except for the applicant substantially involved in a consortium, or other business arrangement (including all parties to the application at any tier), responding to the solicitation.

**“Project”** means the set of activities described in an application or other document approved by the Federal government for financial assistance, whether such assistance represents all or only a portion of the support necessary to carry out those activities.

**“Project period”** means the total period of time indicated in an award during which the Federal government expects to provide support contingent upon satisfactory progress and available funds. A project period may consist of one or more years and may be extended by the Federal government.

**“Proposal”** means the documentation submitted in response to a solicitation. See also Application.

**“Recipient”** means the organization, individual, or other entity that receives a financial assistance award from the Federal government under this solicitation and is financially accountable for the use of any Federal funds or property provided for the performance of the project, and is legally responsible for carrying out the terms and conditions of the award.

**“Selection”** means the determination by the Selection Official that negotiations take place for certain projects with the intent of awarding a financial assistance instrument.

**“Selection Official”** means the DOE or USDA official designated to select applications for negotiation toward award under a solicitation.



**“Substantial Involvement”** means involvement on the part of the Government, and applies only to cooperative agreements. DOE’s involvement may include shared responsibility for the performance of the project; providing technical assistance or guidance which the applicant is required 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.

**“Total project cost”** means all the funds required to complete the effort proposed by the applicant, including Federal funds plus all other funds that will be committed by the applicant as cost sharing for the project.

## APPENDIX B – DETAILED DESCRIPTIONS OF TECHNICAL TOPIC AREAS

### DOE TECHNICAL TOPIC AREAS

#### 1. Thermochemical Conversion – SynGas Cleanup & Conditioning and Pyrolytic Bio-Oils – Handling and Blending Characteristics

- a. Required minimum cost share – 20%
- b. Syngas cleanup (tars, N, alkali, heavy metals, and sulfur)
  - i. Catalytic conversion
  - ii. Condensing cleanup
  - iii. Non-condensing cleanup (including plasma tar destruction)
- c. Pyrolytic Bio-Oils
  - i. Handling (toxicity, stability, transportation, storage)
  - ii. Blending characteristics

**Description:** Raw gases from biomass systems, including black liquor systems, do not meet strict quality standards for downstream fuel or chemical synthesis catalysts or those for some power technologies (fuel cells or fuel cell/turbine hybrids), and will require gas cleaning and conditioning to remove contaminants such as tar, particulates, alkali, ammonia, chlorine, and sulfur. Available cleanup technologies do not meet the cost, performance or environmental criteria needed to achieve the program goals or commercial implementation.

Applications are being solicited in the areas of 1) improved catalysts for tar, benzene, ammonia, and sulfur destruction or mitigation within the syngas, 2) improved reliability, ammonia separation/recovery and environmental performance of condensing syngas cleanup systems, 3) improved techniques for removal of particulates, volatile alkalis, heavy metals, and sulfur in either condensing (low temperature) or non-condensing (high temperature) syngas cleanup systems, 4) methods for improving the handling characteristics of pyrolytic bio-oils (toxicity, stability) for safe transport and long-term storage, and 5) determining the blending characteristics of pyrolytic bio-oils with commercial petroleum fuels.

The application must present a basis for the predicted improvements. Simply performing experiments to gain additional data for an existing established technique will not be considered responsive. The proposal must identify the gasification, pyrolysis, or other thermal conversion system and provide data for biomass conversions, including yields, temperature pressures, compositions, etc. used as the basis for defining inlet conditions to the cleanup and conditioning process. Using composition and contaminant data from a system that has not operated using biomass will not be considered responsive.

**Barriers:**

1. Feasibility, cost, environmental, and reliability concerns for cleanup and conditioning technologies.
2. Product properties: impact on downstream costs, fungibility of intermediate product.

**Desired outcomes:** Development of processes meeting the required specification for downstream synthesis operations or meeting established commercial product specifications for the identified market.

## 2. Thermochemical Conversion and Conditioning – Fundamental Breakthrough Research

- a. Required minimum cost share – 20%

**Description:** Thermochemical biomass conversion techniques—gasification, pyrolysis, and hydrothermal conversion—have been studied and developed over the past half century. While ongoing development shows significant technical innovation, the development results in incremental improvements in final product costs. Proposals may include R&D to improve the ability of the gasification or pyrolysis process to eliminate tars, sulfur, and particulates in process (e.g. within the reactor). Proposals are being solicited that address the chemistry of thermochemical conversion that ultimately have the potential to result in greatly improved thermochemical conversion rates and greatly reduced costs. The goal is to greatly reduce the cost of producing clean fuels and chemicals from biomass. Projects should have in mind the ultimate goal of producing fungible intermediate or final products, and should identify the specific target and address the specifications required for commercial markets, such as cleanliness, physical properties, etc.

Concepts that are simply incremental improvements in existing processes are not wanted and will be considered unresponsive.

**Barriers:** Cost and efficiency of biomass thermochemical conversion, and cost and efficiency of cleanup and conditioning.

**Desired Outcomes:** Innovative conversion and cleanup systems with the potential for order of magnitude improvements in processing costs or product value.

## 3. Biomass – Petroleum Refinery Evaluations

- a. Required minimum cost share – 20% total - must include at least a 10% portion of cost share from oil or gas industry partner.

**Description:** Use of biomass has not been demonstrated for commercial use in the petroleum refining industry. Applications are being sought to perform detailed evaluations of using biomass as feed or co-feed to all potentially suitable refinery conversion processes, e.g., hydrotreaters, catalytic crackers, hydrocrackers, cokers, etc. The evaluations may be analytical or pilot-scale. If potential attractive results are obtained for any unit operation, the analysis should include approaches for tracking the amount of renewable product. The applicant team must include an oil or gas industry partner.

**Barriers:** Utilization of biomass for petroleum refineries.

**Desired Outcomes:** Identification of opportunities for the use of biomass as petroleum refinery feed.

## 4. Thermochemical Conversion – Kraft Black Liquor Gasification

- a. Required minimum cost share – 20%.

**Description:** R&D applications are being solicited to assist in Kraft black liquor gasification development thereby supporting the majority of United States' paper and pulp mills. Applications must identify the gasification or other thermal conversion system and provide data for black liquor

conversions, including yields, temperature pressures, compositions, etc. used as the basis for defining the process efficiencies, environmental benefits, and system economics. Methodology to reduce capital intensity and minimize risks of commercial demonstration must be addressed.

**Barriers:** Develop a reliable gasifier to produce syngas and provide chemical recovery. The path forward sought is to demonstrate cost-effective, energy efficient, gasification technologies for integrated gasification combined cycle (IGCC) or gasification/cogeneration applications. The technical barriers which must be surmounted before commercialization of these technologies are understood to be:

1. Materials of construction with known life expectancy;
2. Gas clean-up in the high sulfur-laden gas specific to the Kraft process; and
3. Integration of gasification; power cycle, syngas conversion, and pulp mill systems are critical technical areas.

**Desired Outcomes:** Implementation of cost-effective, energy efficient, gasification technologies for integrated gasification combined cycle (IGCC) or gasification/cogeneration applications yielding a syngas capable of use in a power generation cycle, or production of fuels and chemicals. Through this solicitation, DOE expects to support applications for the research and development of Kraft black liquor gasification systems up to but not exceeding a pilot validation scale.

## USDA TECHNICAL TOPIC AREAS

### 5. Feedstock Development and Production

- a. Required minimum cost share – 20%

**Description:** Proposals are invited for research, development, and demonstrations on crop and forest residues and suitable crops as biomass feedstocks having significant commercial potential for application in the production of bioenergy, biofuels, and biobased products. Efforts should include appropriate high opportunity crop and residue feedstocks as well as agronomic and silvicultural methods to attain sustainable feedstock production.

Proposals are solicited for research, development, and demonstration projects that develop appropriate agriculture and forest production/management systems, and equipment designs/evaluations to produce and harvest biomass; and for research that develops tools which land managers and community developers can use in evaluating the technical and economic viability of biomass production and use. These tools should integrate research on management, harvesting, and processing with the economics of utilization options for bioenergy, biofuels, and biobased products.

**Desired Outcomes:**

- Substantive development and demonstrations of known research technologies that can be effectively and economically used for biomass production, including comparative research between a variety of residue sources and energy specific crops such as, for example, poplar trees, switchgrass, corn, sugarcane, and small diameter wood from forest thinnings.
- Methods and costs of collection, handling, processing, and transportation of crops, including residue, that promote economic viability of their use as biomass feedstocks.
- Harvesting systems and methods that allow for appropriate residue to effectively protect the landscape, including the soil, water, and related natural resources.

- Tools that aid forest land managers and community developers in evaluating the technical and economic viability of biomass production and use; and that aid in evaluating the costs to provide varying amounts of biomass in a local area, potential revenue streams for various mixes of products, and delivered value of biomass for such products.

## 6. Biobased Products – Environmental and Economic Performance

- a. Required minimum cost share – 20%

**Description:** Greater technical and analytical understanding is needed on the environmental performance and sustainability of biobased products including those that lead to healthy rural economic development.

Proposals are sought on production and use of biobased products, including developments and demonstrations of the effects on greenhouse gasses and carbon sequestration, land management practices and natural resource impacts, including product performance standards.

Proposals are also sought on the impact of co-products, including food, animal feed, wood, and fiber, on biobased products price and large-scale economic viability, particularly where new revenue streams are created that can enhance rural economic development and improve the quality of life in rural America.

**Desired Outcomes:**

- Developments and demonstrations of methods and strategies for commercially viable biobased products that simultaneously provide environmental benefits to society from their harvest, processing, development and use.
- Projects that overcome barriers to effective commercialization of biobased products.

## 7. Biomass Focused Forest Management Training

- a. Required minimum cost share – 20%

**Description:** Title II of the Healthy Forest Restoration Act of 2003 added certain aspects of forest management to the Biomass Research and Development Act of 2000 (PL 108-148). In order to address these concerns, proposals are solicited that involve developing, testing, and employing curricula materials and training programs for use by forest managers and community developers. The focus of the curricula and training should center on improved systems for managing, harvesting, processing, and utilizing woody biomass for the purpose of developing and producing bioenergy, biofuels, and biobased products.

**Desired Outcomes:** Improved biomass training programs and curricula materials that focus on forest management practices and methodologies that: enhance the economics of using forest based materials for biobased products, biofuels, and bioenergy; are appropriate for varied landscapes, terrains, and tree sizes; and minimize adverse impacts on the land.

## 8. Incentives

- a. Required minimum cost share – 20%

**Description:** Proposals are invited that would specifically develop workable systems that would induce greater commercialization and adoption of biobased products, fuels, and power consistent with a market based economic system. Well developed demonstration projects, grounded on

known verifiable information and technologies, are needed in order to promote cost effective and targeted incentive systems for biomass commercialization and adoption. Of particular interest are applications that address viable options for mobile or small scale biopower projects for rural locations and communities.

Project proposals are sought that develop strategies and mechanisms for internalizing the benefits and costs of biobased products and fuels with significant environmental features and benefits. These strategies can include a wide range of options such as subsidies, tax and regulatory considerations, community based goals, logos and labeling leading to pricing differentials, and similar mechanisms. This could include creating markets for externalities, such as trading or credit systems for carbon dioxide or sulfur from power plant emissions.

***Desired Outcomes:***

- Analyses and demonstration projects that effectively address suitable incentive systems for biomass.
- Projects that overcome or minimize the initial investment costs of traditional infrastructure development usually encountered in rural areas.
- Strategies and technologies that overcome the distances separating markets and raw materials of rural based bioproduct and bioenergy developments.

**APPENDIX C – RELEVANCE OF TECHNICAL TOPIC AREAS TO THE ROADMAP FOR  
BIOENERGY & BIOBASED PRODUCTS IN THE UNITED STATES**

<b>DOE TECHNICAL TOPIC AREAS</b>	
<b>Technical Topic Area</b>	<b>Biomass Technical Advisory Committee (TAC) Roadmap</b>
<p><b>(1) Thermochemical Conversion – Syngas Cleanup &amp; Conditioning and Pyrolytic Bio-oils – Handling and Blending Characteristics</b></p> <p>Raw gasses from biomass systems, including black liquor systems, do not meet quality standards for commercial implementation. Applications are being solicited in the areas of:</p> <ul style="list-style-type: none"> <li>• improved catalysts for tar, benzene, and ammonia, and sulfur destruction or mitigation within the syngas,</li> <li>• improved reliability, ammonia separation/recovery and environmental performance of condensing syngas cleanup systems,</li> <li>• improved techniques for removal of particulates, volatile alkalis, heavy metals, and sulfur in either condensing (low temp) or non-condensing (high temp) syngas cleanup systems,</li> <li>• methods for improving the handling characteristics of pyrolytic bio-oils (toxicity, stability) for safe transport and long-term storage, and</li> <li>• determining the blending characteristics of pyrolytic bio-oils with commercial petroleum fuels.</li> </ul>	<p>Processing and Conversion</p> <ul style="list-style-type: none"> <li>• Thermochemical Conversion Pathways</li> <li>• Bioconversion</li> <li>• Biorefinery Integration</li> </ul>
<p><b>(2) Thermochemical Conversion and Conditioning – Fundamental Breakthrough Research</b></p> <p>Ongoing technical innovations in thermochemical biomass conversion have resulted in small improvements in final product costs.</p> <p>Proposals are being solicited that address the chemistry of thermochemical conversion to result in greatly improved thermochemical conversion rates and greatly reduced costs. The goal is to greatly reduce the cost of producing clean fuels and chemicals from biomass.</p>	<p>Processing and Conversion</p> <ul style="list-style-type: none"> <li>• Thermochemical Conversion Pathways</li> <li>• Bioconversion</li> <li>• Biorefinery Integration</li> </ul>
<p><b>(3) Biomass – Petroleum Refinery Evaluations</b></p> <p>Use of thermochemical bio-oils and syngas has not been demonstrated for commercial use in the petroleum refining industry.</p> <p>Proposals are being sought to perform detailed evaluations of using pyrolytic bio-oils and syngas as feed or co-feed to all potentially suitable refinery conversion processes, e.g., hydrotreaters, catalytic crackers, hydrocrackers, cokers, etc. The evaluations may be analytical or pilot-scale. If potential attractive results are obtained for any unit operation, the analysis should include approaches for tracking the amount of renewable product.</p>	<p>Product Uses and Distribution</p> <ul style="list-style-type: none"> <li>• End products and distribution systems</li> </ul>

<b>Technical Topic Area</b>	<b>TAC Roadmap</b>
<p><b>(4) Thermochemical Conversion – Kraft Black Liquor Gasification</b></p> <p>R&amp;D applications are being solicited to assist in Kraft black liquor gasification development, thereby supporting the majority of United States' paper and pulp mills.</p> <p>The objective is to develop a reliable gasifier to produce syngas and provide chemical recovery by demonstrating cost-effective, energy efficient, gasification technologies for integrated gasification combined cycle (IGCC) or gasification/cogeneration applications. Technical barriers to commercialization of these technologies are understood to be:</p> <ul style="list-style-type: none"> <li>• Materials of construction with known life expectancy,</li> <li>• Gas clean-up in the high sulfur-laden gas specific to the Kraft process, and</li> <li>• Integration of gasification; power cycle, syngas conversion, and pulp mill systems are critical technical areas</li> </ul>	<p>Processing and Conversion</p> <ul style="list-style-type: none"> <li>• Thermochemical Conversion Pathways</li> <li>• Bioconversion</li> <li>• Biorefinery Integration</li> </ul>
<b>USDA TECHNICAL TOPIC AREAS</b>	
<p><b>(5) Feedstock Development and Production</b></p> <p>Proposals are being invited for research, development, and demonstration projects on:</p> <ul style="list-style-type: none"> <li>• Crop and forest residues and suitable crops as biomass feedstocks having significant commercial potential for production of bioenergy, biofuels, and biobased products. Efforts should include appropriate high opportunity crop and residue feedstocks as well as agronomic and silvicultural methods to attain sustainable feedstock production.</li> <li>• Agriculture and forest production/management systems, and equipment designs/evaluations to produce and harvest biomass; and for research that develops tools which land managers and community developers can use in evaluating the technical and economic viability of biomass production and use.</li> </ul>	<p>Feedstock Production</p> <ul style="list-style-type: none"> <li>• Biotechnology and Plant Physiology</li> <li>• Agronomic Practices</li> <li>• Feedstock Handling</li> </ul> <p>Public Policy Measures to Support Biomass Development</p> <ul style="list-style-type: none"> <li>• Economic Analysis</li> <li>• Life Cycle Analysis</li> <li>• Procurement and Markets</li> <li>• Regulatory Measures</li> <li>• Incentives</li> <li>• Biomass Resource Supply</li> <li>• Education and Outreach</li> <li>• R&amp;D Investment</li> </ul>



Technical Topic Area	TAC Roadmap
<p><b>(6) Biobased Products – Environmental and Economic Performance</b></p> <p>Greater analytical, technical, and economic understanding is needed of the environmental performance and sustainability of biobased products, including those leading to healthy rural economic development.</p> <p>Proposals are sought on:</p> <ul style="list-style-type: none"> <li>• Production and use of biobased products, including developments and demonstrations of the effects on greenhouse gasses and carbon sequestration, land management practices, and natural resource impacts, including product performance standards.</li> <li>• Impacts of co-products, including food, animal feed, wood, and fiber, on the price and large-scale economic viability of biobased products, particularly where new revenue streams are created that can enhance rural economic development and improve the quality of life in rural America.</li> </ul>	<p>Product Uses and Distribution</p> <ul style="list-style-type: none"> <li>• End products and distribution systems</li> </ul> <p>Public Policy Measures to Support Biomass Development</p> <ul style="list-style-type: none"> <li>• Economic Analysis</li> <li>• Life Cycle Analysis</li> <li>• Procurement and Markets</li> <li>• Regulatory Measures</li> <li>• Incentives</li> <li>• Biomass Resource Supply</li> <li>• Education and Outreach</li> <li>• R&amp;D Investment</li> </ul>
<p><b>(7) Biomass Focused Forest Management Training</b></p> <p>Title II of the Healthy Forest Restoration Act of 2003 added certain aspects of forest management to the Biomass Research and Development Act of 2000. To address these concerns, proposals are solicited that involve developing, testing, and employing curricula materials and training programs for use by forest managers and community developers. The curricula and training should focus on improved systems for managing, harvesting, processing and utilizing woody biomass for the purpose of developing and producing bioenergy, biofuels, and biobased products.</p>	<p>Public Policy Measures to Support Biomass Development</p> <ul style="list-style-type: none"> <li>• Economic Analysis</li> <li>• Life Cycle Analysis</li> <li>• Procurement and Markets</li> <li>• Regulatory Measures</li> <li>• Incentives</li> <li>• Biomass Resource Supply</li> <li>• Education and Outreach</li> <li>• R&amp;D Investment</li> </ul>
<p><b>(8) Incentives</b></p> <p>Proposals are invited that would specifically develop workable systems that would induce greater commercialization and adoption of biobased products, fuels, and power consistent with a market based economic system. Well developed demonstration projects, grounded on known verifiable information and technologies, are needed in order to promote cost effective and targeted incentive systems for biomass commercialization and adoption. Of particular interest are applications that address viable options for mobile or small scale biopower projects for rural locations and communities.</p> <p>Project proposals are sought that develop strategies and mechanisms for internalizing the benefits and costs of biobased products and fuels with significant environmental features and benefits. These strategies can include a wide range of options such as subsidies, tax and regulatory considerations, community based goals, logos and labeling leading to pricing differentials, and similar mechanisms. This could include creating markets for externalities, such as trading or credit systems for carbon dioxide or sulfur from power plant emissions.</p>	<p>Public Policy Measures to Support Biomass Development</p> <ul style="list-style-type: none"> <li>• Economic Analysis</li> <li>• Life Cycle Analysis</li> <li>• Procurement and Markets</li> <li>• Regulatory Measures</li> <li>• Incentives</li> <li>• Biomass Resource Supply</li> <li>• Education and Outreach</li> <li>• R&amp;D Investment</li> </ul>

**APPENDIX D – REGISTRATION FORM AND COVER PAGE**

# BIOMASS RESEARCH AND DEVELOPMENT INITIATIVE

DE-PS36-04GO94002

## REGISTRATION FORM

If you intend to submit a pre-application for this solicitation, please detach this page and the next page and fill in the blanks below. When completed, make a double-sided copy or fold the pages together in thirds so that the DOE address shows on the outside, tape closed, affix postage, and put in the U.S. mail. Thank you.

### APPLICANT INFORMATION

Name: \_\_\_\_\_

Company: \_\_\_\_\_

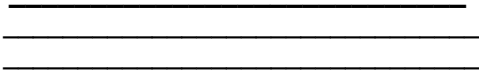
Address: \_\_\_\_\_

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Phone: \_\_\_\_\_

Email: \_\_\_\_\_



Place  
Stamp  
Here

**Department of Energy  
Golden Field Office  
ATTN: Solicitation Coordinator, DE-PS36-04GO94002  
1617 Cole Blvd.  
Golden, CO 80401**

**COVER PAGE for  
PRE-APPLICATION  
AND  
FULL APPLICATION**

**Biomass Research and Development Initiative**

**DE-PS36-04GO94002**

**Project Name:** \_\_\_\_\_  
\_\_\_\_\_

**Name of Applicant:** \_\_\_\_\_

**Point of Contact:** \_\_\_\_\_

**Address:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Phone:** \_\_\_\_\_

**FAX:** \_\_\_\_\_

**Email:** \_\_\_\_\_

**Date Submitted:** \_\_\_\_\_

\_\_\_\_\_ Applicant is a U.S. entity.

**The enclosed pre-application or full application responds to the following Technical Topic Area (check only one topic).**

**Note: Detailed descriptions of the Technical Topic Areas can be found in Appendix B.**

- \_\_\_ 1. DOE: Thermochemical Conversion – SynGas Cleanup & Conditioning and Pyrolytic Bio-Oils – Handling and Blending Characteristics
- \_\_\_ 2. DOE: Thermochemical Conversion – Fundamental Breakthrough Research
- \_\_\_ 3. DOE: Biomass – Petroleum Refinery Evaluations
- \_\_\_ 4. DOE: Thermochemical Conversion – Kraft Black Liquor Gasification
- \_\_\_ 5. USDA: Feedstock Development and Production
- \_\_\_ 6. USDA: Biobased Products – Environmental and Economic Performance
- \_\_\_ 7. USDA: Biomass Focused Forest Management Training
- \_\_\_ 8. USDA: Incentives