

**FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT**

**U. S. Department of Energy
National Energy Technology Laboratory
FY2013 Unconventional Gas and Oil Technologies
Funding Opportunity Number: DE-FOA-0000894**

Announcement Type: Initial

CFDA Number: 81.089 Fossil Energy Research and Development

Issue Date:	04/17/2013
Letter of Intent Due Date:	Not Applicable
Pre-Application Due Date:	Not Applicable
Application Due Date:	06/17/2013 11:59:59 PM Eastern Time

NOTE: REGISTRATION/SUBMISSION REQUIREMENTS

Registration Requirements

There are several one-time actions you must complete in order to submit an application in response to this Announcement (e.g., obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number, register with the System for Award Management (SAM), and register with Grants.gov). Applicants who are not registered with SAM and Grants.gov, should allow at least 44 days to complete these requirements. It is suggested that the process be started as soon as possible.

Applicants must obtain a DUNS number. DUNS website:
<http://fedgov.dnb.com/webform>.

Applicants must register with the SAM. SAM website: <http://www.sam.gov/>. If you had an active registration in CCR, you should have an active registration in SAM. More information about SAM registration for applicants is found at:
https://www.sam.gov/sam/transcript/Quick_Guide_for_Grants_Registrations_v1.7.pdf.

Applicants must register with Grants.gov. There are 3 steps to this process.

1. **The Authorized Organizational Representative (AOR) must register at:**
<https://apply07.grants.gov/apply/OrcRegister> .
2. **An email is sent to the E-Business (E-Biz) POC listed in SAM. The E-Biz POC must approve the AOR registration using their MPIN from their SAM registration.**
3. **AOR verifies that registration was completed at:**
http://grants.gov/applicants/applicant_profile.jsp.

More information about the above steps is provided at:
http://www.grants.gov/applicants/organization_registration.jsp.

Applicants must register with FedConnect to submit questions. FedConnect website: www.fedconnect.net.

Questions

Questions relating to the registration process, **system requirements, or how an application form works** must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov.

Questions regarding the **content** of the announcement must be submitted through the FedConnect portal. You must register with FedConnect to respond as an interested party to submit questions, and to view responses to questions. It is recommended that you register as soon after release of the FOA as possible to have the benefit of all responses. DOE/NNSA will try to respond to a question within 3 business days, unless a similar question and answer have already been posted on the website.

Application Preparation and Submission

Applicants must download the application package, application forms and instructions, from Grants.gov. Grants.gov website: <http://www.grants.gov/> (Additional instructions are provided in Section IV A of this FOA.)

Where to Submit

Applications must be submitted through Grants.gov to be considered for award. You cannot submit an application through Grants.gov unless you are registered. Please read the registration requirements carefully and start the process immediately. Remember you have to update your SAM registration annually. If you have any questions about your registration, you should contact the Grants.gov Helpdesk at 1-800-518-4726 to verify that you are still registered in Grants.gov.

IMPORTANT NOTICE TO POTENTIAL APPLICANTS: When you have completed the process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e. Grants.gov registration).

Applications should be received by **June 17, 2013**, not later than **11:59:59 PM Eastern Time**. You are encouraged to transmit your application well before the deadline. The Grants.gov Helpdesk is available for extended periods; please check their website for the Helpdesk hours of operation. APPLICATIONS RECEIVED AFTER THE DEADLINE WILL NOT BE REVIEWED OR CONSIDERED FOR AWARD.

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Section I - FUNDING OPPORTUNITY DESCRIPTION

A. SUMMARY

The intent of this Department of Energy (DOE), National Energy Technology Laboratory (NETL) FOA is to select and award projects in FY13 that focus on improving the environmental performance of shale gas, tight oil, and tight gas resource development. This can be achieved by mitigating issues related to wellbore integrity and zonal isolation (protecting shallow groundwater resources) and by reducing water usage, air emissions, and resource degradation through better unconventional resource stimulation that appropriately matches technology to local geologic and hydrologic conditions. This announcement is a critical component of the DOE portfolio to advance the environmentally-sound development of unconventional domestic natural gas and oil resources and it will support ongoing programmatic efforts to (1) improve our understanding of the nature and impacts of unconventional resource development, (2) develop improved technologies and engineering practices to ensure these resources are developed safely and with minimal environmental impact, and (3) increase supply of U.S. oil and gas resources in order to enhance national energy security and further reduce energy imports .

B. BACKGROUND

The goal of the U.S. Department of Energy, Office of Fossil Energy's (FE) Oil and Natural Gas Program is to provide the information and technologies that will assure abundant, affordable, and environmentally sustainable supplies of domestic natural gas and oil resources. The Strategic Center for Natural Gas and Oil (SCNGO) at the National Energy Technology Laboratory (NETL) integrates all elements of FE's oil and natural gas research and is charged with implementing science and technology development through cost-shared research and the coordination of on-site research activities. Current research includes: methane hydrates, ultra-deepwater, and unconventional oil and gas technologies.

In addition to directly managing research focused on these topics, SCNGO provides review and oversight of an oil and natural gas research and development (R&D) program that is administered, in part, by a non-profit consortium—the Research Partnership to Secure Energy for America (RPSEA) —under Title IX, Subtitle J, Section 999 of the Energy Policy Act of 2005. The DOE-RPSEA research program is focused on three areas as specified by statute: ultra-deepwater development, unconventional natural gas and other petroleum resources, and technology challenges for small producers. In addition, complementary research is conducted by NETL's Office of Research and Development.

Applicants are encouraged to become familiar with the Department's Oil and Natural Gas Program. Information can be found at:

<http://www.netl.doe.gov/technologies/oil-gas/publications/EPreports/2011-005539-unc-fe-report-congress-final-oct-2011.pdf>

<http://www.netl.doe.gov/technologies/oil-gas/index.html>,

<http://www.netl.doe.gov/technologies/oil-gas/EPAct2005/Index.html>, or
http://www.fe.doe.gov/programs/oilgas/ultra_and_unconventional/index.html.

C. OBJECTIVES AND TECHNICAL TOPIC AREAS

America's abundant unconventional oil and natural gas (UOG) resources, which include natural gas and oil contained in shale or other low permeability geological formations, are critical components of our nation's energy portfolio. Full and effective UOG development can enhance America's energy security and create significant income, employment, and other economic benefits that are crucial to the United States (U.S.) economy.

In April 2012, the President issued an Executive Order that established the Multi-agency Working Group to Support Safe and Responsible Development of Unconventional Domestic Natural Gas Resources (Executive Order, 2012). Since a large body of the UOG federal research activities and expertise is held by the Department of Energy (DOE), Department of the Interior (DOI), and Environmental Protection Agency (EPA) (the Agencies), the Agencies signed a multi-agency Memorandum of Agreement pledging to develop a focused, collaborative research effort to address high-priority challenges in safe and prudent development of UOG resources (Multi-agency, 2012).

The primary goal of this multi-agency research effort is to provide timely science and tools that protect the environment, support sound policy, allow for informed UOG resource development decisions at many levels (federal, state, tribal, and local; industry; and the public), and to advance technologies that will maximize benefits to the nation. Recognizing this effort and the current research portfolio as well as legacy projects, the following topic areas have been developed as focus areas of research under Fossil Energy's Oil and Natural Gas Program. Continued research in these topic areas will allow DOE to continue to develop its understanding of the nature and impacts of unconventional resource development, to ensure these resources are developed safely and with minimal environmental impact, and to enhance national energy security and further reduce energy imports.

Notification of Activities that May Require an Environmental Assessment:

This funding opportunity announcement considers the use of DOE program funds and cost share project funds for activities such as active hydraulic fracturing or other fracture stimulation processes as part of the application. Applications that include these activities as part of the project could require the completion of an Environmental Assessment (EA) prior to the undertaking of project activities. The time required for the performance of that type of environmental review/analysis (typically 6-12 months for an EA) may preclude award of these projects prior to the end of the current Fiscal Year (September 30, 2013) or a delay in the initiation of field work. Activities such as data collection, monitoring, bench scale laboratory activities, data evaluation, and modeling of hydraulic fracturing operations are not anticipated to require an EA.

Proposed research must address one of the Topic Areas described below rather than addressing only the broader objectives defined in these introductory paragraphs. Applicants should identify the Topic Area they are responding to on the cover page of their application.

NOTE 1: Applications should be prepared so that R&D and demonstration tasks (along with associated budget estimates, including cost share) can be readily identified.

NOTE 2: The government is contemplating making multiple selections for the various Topic Areas (TA). Therefore DOE may elect to notify applicants selected for award in a given Topic Area rather than notifying all applicants selected for award from the entire announcement. Essentially, DOE may elect to stagger awards for applications received under a Topic Area based on available funding.

NOTE 3: Applicants must identify the Topic Area they are applying against within the Narrative of the application. If DOE believes an application fits more appropriately in a Program Topic Area, other than the one identified within the application, DOE may consider the application under the more appropriate Topic Area. Applicants may submit applications to one or more Topic Areas. However the applicant must submit separate applications for each Topic Area under which they are applying.

Topic Area 1 – Reduced Footprint of UOG Development

Tight oil, tight gas sands, and gas shales, represent a significant domestic energy resource. While in-place resources are substantial, recovery efficiencies are commonly low in these reservoirs, leaving substantial volumes behind. Under current practices, the ultimate development of these resources is expected to require significant numbers of wells, placing significant burdens on the environment and on communities. The objective of Topic Area 1 will be to address critical gaps in knowledge of the geology, petrophysics, geomechanics and completion/stimulation strategies to enable the reduction of industrial activity and the overall environmental impact in the area being developed while ensuring the maximum public value from the production of this resource.

Research areas of specific interest under this topic area include, but are not limited to:

1. Collection and analyses of field data that will elucidate the nature of, and geologic/engineering controls on, varying reservoir response along the length of horizontal wells, both before and after stimulation.
2. Research to determine the effects of water injection on reservoir petrophysical properties and the evaluation of the optimal use of stimulation fluids to reduce the number of wells needed to develop a given area by maximizing the ultimate hydrocarbon recovery from individual wells.
3. Minimizing the total number of wells through optimized field development strategies, considering the most effective placement of wells in both space and time.
4. Avoiding potential Environmental, Health, and Safety impacts through development of play-specific remote sensing acquisition and interpretation technologies that enable improved prospect characterization and pre-drill assessment of geologic conditions.

Topic Area 2 – Assuring, Monitoring, and Mitigating Issues Related to Methane Emissions, Wellbore Integrity, and Zonal Isolation (protecting shallow groundwater resources)

Many of the public concerns regarding unconventional resource development and production reflect concern about the potential impacts on air and water quality in the context of both ecosystems and human well-being. The objective of Topic Area 2 will be to address research focused toward protecting air and water quality through assuring, monitoring, and mitigating issues related to fugitive methane emissions, wellbore integrity and zonal isolation over various time-scales during full-field development.

Research areas of specific interest under this topic area include, but are not limited to:

1. Assessment of the nature, rates, and controls on fugitive methane emissions, including improved technologies or methodologies for 1) quantifying changes in air quality, 2) attributing those changes to specific components of the full life cycle of unconventional oil and gas development, and/or 3) substantial reduction in emissions.
2. Assessment of the reliability of current procedures and materials in maintaining the long-term integrity of wellbores in unconventional resource development.
3. Development of play-specific remote sensing acquisition and interpretation technologies that enable pre-drill assessment of geologic features that promotes long-term well integrity and isolation of production activities from shallow groundwater resources.
4. Assessment of the long-term impact of resource development enabled through fracturing stimulation on subsurface hydrologic systems, with an emphasis on the potential interaction of resource development with various natural pathways for migration of fluids through the subsurface.

Topic Area 3 – Reducing Water Usage and Resource Degradation through Smarter and Less Water-Intensive Unconventional Resource Stimulation

The goal of this research would be to develop and/or field test novel approaches and technologies that could potentially reduce the use of water in unconventional resource development.

Research areas of specific interest under this topic area include, but are not limited to:

5. Development and validation of novel technologies and processes to reduce the usage of fresh water in unconventional resource development, including concepts that utilize existing non-potable water sources, expand the effectiveness of flowback water treatment processes, and others.
6. Development, validation, and/or demonstration of waterless stimulation technologies, which can be used instead of, or in tandem with, water-based hydraulic fracturing to reduce water usage and volume of flowback fluids.

NOTE: Applications submitted that address kerogen-rich shales commonly referred to as oil shales such as those found in the Greater Green River Formation (e.g., Mahogany zone) will be considered **non-responsive** to this FOA and will not be reviewed nor considered for award.

Section II - AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT

DOE anticipates awarding cooperative agreements under this funding opportunity announcement (See Section VI.B.2 Statement of Substantial Involvement).

B. ESTIMATED FUNDING

Approximately \$8M is expected to be available for new awards under this announcement. Funding for all awards is contingent upon the availability of funds appropriated by Congress for the purpose of this program.

C. MAXIMUM AND MINIMUM AWARD SIZE

Ceiling (i.e., the maximum amount for an individual award made under this announcement):

None

Floor (i.e., the minimum amount for an individual award made under this announcement):

None

D. EXPECTED NUMBER OF AWARDS

DOE anticipates making five (5) to ten (10) awards under this announcement depending on the size of the awards.

E. ANTICIPATED AWARD SIZE

DOE anticipates having multiple awards. DOE anticipates that the award size will be up to \$1,500,000 total project value (including cost share); up to \$3,000,000 total project value if field project(s) are selected.

F. PERIOD OF PERFORMANCE

DOE anticipates making awards with an estimated project period of 2 to 4 years.

G. TYPE OF APPLICATION

DOE will accept only new applications under this announcement.

Section III - ELIGIBILITY INFORMATION

A. ELIGIBLE APPLICANTS

All types of domestic entities are eligible to apply, except other Federal agencies, Federally Funded Research and Development Center (FFRDC) Contractors, and nonprofit organizations described in section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995.

Domestic Entities

For-profit entities, educational institutions, and nonprofits that are incorporated (or otherwise formed) under the laws of a particular State or territory of the United States are eligible to apply for funding as a prime recipient or subrecipient.

State, local, and tribal government entities are eligible to apply for funding as a prime recipient or subrecipient.

DOE Federally Funded Research and Development Centers (FFRDCs) are eligible to apply as a subrecipient, but are not eligible to apply as a prime recipient.

Non-DOE FFRDCs are eligible to apply as a subrecipient, but are not eligible to apply as a prime recipient.

Federal agencies and instrumentalities (other than DOE) are not eligible to apply as a subrecipient or as a prime recipient.

NOTE: NETL is not eligible to receive an award under this announcement and may not be proposed as a team member on another entity's application.

B. COST SHARING

The cost share must be at least 20% of the total allowable costs for research and development projects and 50% of the total allowable costs for demonstration and commercial application projects and must come from non-Federal sources unless otherwise allowed by law. 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. (See 10 CFR 600 for the applicable cost sharing requirements.)

Total Project Costs = DOE share + Recipient Cost Share.

If FFRDC participates: Total Project Costs = DOE share + FFRDC Costs + Recipient Cost Share.

C. OTHER ELIGIBILITY REQUIREMENTS

FFRDC/National Laboratories

The DOE Federally Funded Research and Development Centers (FFRDCs) are prohibited from submitting an application as a prime recipient but may be eligible to partner with an eligible organization.

FFRDC contractors may be proposed as a team member on another entity's application subject to the following guidelines:

Authorization for non-DOE FFRDCs. The Federal agency sponsoring the FFRDC contractor must authorize in writing the use of the FFRDC contractor on the proposed project and this authorization must be submitted with the application. The use of a FFRDC contractor must be consistent with the contractor's authority under its award and must not place the FFRDC contractor in direct competition with the private sector.

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 [Name] 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 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. DOE reserves the right to fund the work of

the FFRDC as a subcontract to the prime recipient if deemed appropriate or beneficial to the Government.

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 contractor may not be more significant than the scope of work to be performed by the applicant.
- The FFRDC contractor effort, in aggregate, **shall not exceed 25%** of the total estimated cost of the project, including the applicant's and the FFRDC contractor's portions of the effort.

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 PACKAGE

Application forms and instructions are available at Grants.gov. To access these materials, go to <http://www.grants.gov>, select "Apply for Grants," and then select "Download Application Package." Enter the CFDA and/or the funding opportunity number located on the cover of this announcement and then follow the prompts to download the application package.

B. LETTER OF INTENT AND PRE-APPLICATION

1. Letter of Intent.

Letters of Intent are not required.

2. Pre-application

Pre-applications are not required.

C. CONTENT AND APPLICATION FORMS

You must complete the mandatory forms and any applicable optional forms (e.g., Disclosure of Lobbying Activities (SF-LLL)) in accordance with the instructions on the forms and the additional instructions below. Files that are attached to the forms must be in Adobe Portable Document Format (PDF) unless otherwise specified in this announcement. **Applicants must identify the**

Topic Area (TA) they are applying for (i.e., 1, 2, or 3). The required format for the project title is: "TA [1,2,3 – specify one] (project title)."

1. SF 424 (R&R)

Complete this form first to populate data in other forms. Complete all the required fields in accordance with the pop-up instructions on the form. The list of certifications and assurances referenced in Field 17 can be found on the DOE Financial Assistance Forms Page at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms> under Certifications and Assurances.

2. RESEARCH AND RELATED Other Project Information

Complete questions 1 through 6 and attach files. The files must comply with the following instructions:

Project Summary/Abstract (Field 7 on the Form)

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(maximum of 140 characters due to system limitations), 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 business sensitive information as the Department may make it available to the public after awards are made.** The project summary must not exceed 2 pages 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. To attach a Project Summary/Abstract to Field 7, click "Add Attachment."

Project Narrative (Field 8 on the Form)

The project narrative must not exceed **25** pages single-spaced pages, including the Statement of Project Objectives, charts, graphs, maps, photographs, tables, and other pictorial presentations, when printed, single spaced, using standard 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right) with font not smaller than 11 point. **EVALUATORS WILL ONLY REVIEW THE NUMBER OF PAGES SPECIFIED IN THE PRECEDING SENTENCE.**

Do not include any Internet addresses (URLs) that provide information necessary to review the application, because the information contained in these sites will not be reviewed. See Part VIII.D for instructions on how to mark proprietary application information. To attach a Project Narrative, click "Add Attachment."

The Project Narrative is intended to provide the bulk of the technical content related to the project being proposed. A specific structure for the Project Narrative document, along with descriptions / instructions for each section, is outlined below. Evaluation of the content of the Project Narrative will be a critical component of the evaluation of the application. The criteria

and process by which reviewers will be asked to review the application (including content of the Project Narrative) are defined within this FOA under Section V (Application Review Information)

The Project Narrative should provide sufficient information so that reviewers will be able to evaluate the application in accordance with the merit review criteria listed under Section V. DOE WILL EVALUATE AND CONSIDER ONLY THOSE APPLICATIONS THAT ADDRESS SEPARATELY EACH OF THE MERIT REVIEW CRITERION AND SUB-CRITERION.

The project narrative should be formatted as follows with content as described following the layout.

Cover Page [Excluded from the Project Narrative page limitation of twenty five (25) single-spaced pages]

The cover page shall indicate the funding opportunity notice number, title of proposed project (maximum of 140 characters due to system limitations), **technical topic area for which the application is submitted**, name and address of the Applicant, technical and business points of contact, telephone/FAX number, e-Mail address, and date of application.

Table of Contents [Including List of Tables, Figures, and Acronyms; **excluded from the Project Narrative page limitation of twenty five (25) pages**]

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Project Narrative – Description of Specific Content

This section shall contain the major portion of the Technical Application prepared in the format of the preceding Table of Contents while not exceeding the prescribed page limits. It shall be presented in as much detail as practical and include the following technical information. This section should follow the template included below and should be structured to allow reviewers to evaluate that content in accordance with the Merit Review Criteria described in Section V of this FOA.

1. Scientific and Technical Merit

In this section the Applicant shall provide detailed information, formatted as per the preceding Table of Contents that will allow DOE reviewers to score the application based on Criterion 1 identified in Section V. Content here is intended to fully describe the technical and scientific aspects of the project proposed.

1.1 Statement of the Problem

The Applicant should discuss the nature and significance (scientific, economic, etc.) of the problem being addressed. This section should include a discussion of the current state of technology, knowledge or capabilities, as well as ongoing research being conducted by industry, academia, and other institutions to overcome the problem being addressed in the application. The Applicant should include a discussion of any limitations (technical, costs, others) with regard to the current technology/information and/or research as it relates to the problem being addressed.

1.2 Proposed Advances in Knowledge / Technology

The Applicant should clearly demonstrate that the proposed research is based on sound scientific and engineering principles and is designed to overcome the limitations discussed in Section 1.1, and clearly identify the specific advances and the significance of these advances that will be made over current knowledge, research or state-of-the-art technology.

1.3 Relevance to DOE Goals and Objectives of FOA

The Applicant should provide a clear, concise statement of the specific objective(s) of the proposed research. The Applicant should explain the relevance of the proposed research to the DOE goals and objectives of the FOA and in particular, to the goals and objectives of the specific technical topic area for which the Applicant is responding.

1.4 Impact/Benefit of Proposed Research

This section should discuss and quantify, to the extent appropriate, the potential impact/benefit of the proposed research in comparison to current state of knowledge or technology, or current commercial and emerging technologies in terms of additional recovery, reduced costs or improved economics, resolving environmental barriers, or other benefits of the project.

1.5 Justification for Federal Involvement in R&D

The Applicant should provide the rationale for Federal involvement in this area of research, including assessment of the likelihood that the proposed research would not be undertaken by industry in the near term and/or whether federal involvement could result in acceleration of findings, reduction in risk or broader public benefit. To the degree possible, the Applicant should substantiate their statements.

1.6 Non-Duplicative Research

The Applicant should provide clear evidence that the proposed research is not duplicative of any ongoing research being performed by industry, academia, or other entities. To the degree possible, the Applicant should substantiate their statements.

2. Technical Approach

In this section the Applicant shall provide detailed information, as outlined in the preceding Table of Contents, that will allow DOE reviewers to score the application based on Criterion 2 identified in Section V. Content here is intended to describe the specific approach necessary to conduct the research described in Section 1 above and to define the physical resources necessary to implement that approach. The applicant should include / address the following:

2.1 Statement of Project Objectives and Technical Approach

A detailed SOPO should address how research under the project will be conducted and how the project objectives will be met. The SOPO must contain a clear, concise description of the tasks / subtasks to be completed during project performance and follow the specific format outline below. The content should be limited to definition of the specific activities and should not include extraneous explanation or description of why the research is being done; that should be addressed within Section 1. The SOPO may be released to the public by DOE in whole or in part after award. It is therefore required that it shall not contain proprietary or confidential business information.

{Please note that the specific language listed for Task 1.0, and under “Briefings/Technical Presentations” is mandatory and should be reflected in the SOPO included by the applicant}.

SOPO FORMAT

TITLE OF RESEARCH TO BE PERFORMED

Insert the title of research to be performed. Be concise and descriptive (maximum of 140 characters due to system limitations).

A. OBJECTIVES

Include the overall objective(s) of the research and an objective(s) for each phase of the research, if applicable.

B. SCOPE OF WORK

This section should not exceed one-half page and should summarize the effort and approach to achieve the objective(s) of the research for each Phase.

C. TASKS TO BE PERFORMED

Tasks, concisely written, should be provided in a logical sequence and should be divided into the phases of the project, as appropriate. This section provides a concise listing of the specific steps necessary to conduct the proposed project. Projects proposed with multiple phases should be broken along logical technical lines.

PHASE 1 / BUDGET PERIOD 1

Task 1.0 - Project Management and Planning (Required Task as Written)

The Recipient shall work together with the DOE Project Officer upon award to develop a Project Management Plan (PMP). The PMP shall be submitted within 30 days of the award. The DOE Project Officer shall have 20 calendar days from receipt of the Project Management Plan to review and provide comments to the Recipient. Within 15 calendar days after receipt of the DOE's comments, the Recipient shall submit a final Project Management Plan to the DOE Project Officer for review and approval.

The Recipient shall review, update, and amend the Project Management Plan (as requested by the DOE Project Officer) at key points in the project, notably at each Go/No-Go Decision Point and upon schedule variances of more than 3 months and cost variances of more than 10%, which require amendments to the agreement and constitutes a re-base lining of the project.

The PMP shall define the approach to management of the project and include information relative to project risk, timelines, milestones, funding and cost plans, and decision-point success criteria.

The Recipient shall execute the project in accordance with the approved Project Management Plan covering the entire project period. The Recipient shall manage and control project activities in accordance with their established processes and procedures to ensure subtasks and tasks are completed within schedule and budget constraints defined by the Project Management Plan. This includes tracking and reporting progress and project risks to DOE and other stakeholders.

Task 2.0 - (Title)

Task Description

Subtask 2.1 (Title and/or Task Description)

Subsequent Subtasks (Subtask Number, Title and/or Task Description)

PHASE 2 / BUDGET PERIOD 2 (Optional)

Task 3.0 - (Title)

Task Description

Subtask 2.1 (Title and/or Task Description)

Subsequent Subtasks (Subtask Number, Title and/or Task Description)

Subsequent Tasks (Tasks sequentially numbered through all relevant Phases / Budget Periods)

D. DELIVERABLES (Required)

Include the following content:

The periodic, topical, and final reports shall be submitted in accordance with the attached "Federal Assistance Reporting Checklist" and the instructions accompanying the checklist.

[Note: The Recipient shall provide a list of deliverables other than those identified on the "Federal Assistance Reporting Checklist" that will be delivered. These reports shall also be identified within the text of the Statement of Project Objectives. See the following examples:

1. Task 1 – Project Management Plan
2. Task 2 - (Deliverable Description)
3. Continue with Tasks/Subtasks deliverables as necessary.

E. BRIEFINGS/TECHNICAL PRESENTATIONS (Required)

Include the following content:

1. The Recipient shall participate in a Project Kick Off Meeting to be held at the NETL facility located in Pittsburgh, PA or Morgantown, WV (or at an alternative location to be agreed upon by the DOE and Recipient) within 90 days of the initiation of the agreement.
2. The Recipient shall prepare and present detailed briefings for the Project Officer at an NETL facility located in Pittsburgh, PA or Morgantown, WV (or alternate location mutually agreed upon by the DOE Project Officer and the Recipient). Briefings shall be given by the Recipient to explain the plans, progress, and results of the technical effort at least once per year. DOE may choose to substitute Recipient participation in external peer review or contractor review meeting for this annual briefing.
3. The Recipient shall prepare and present briefings at key project decision points and/or budget period transitions. Every effort will be made to hold these meeting remotely via web-ex but there may be instances where presentation at an NETL site, or other location may be required by DOE. Briefings shall be given by the Recipient to explain the status/progress, and results of the technical effort to that point and shall clearly identify whether decision point criteria for success has been met and progress warrants continuation of efforts under the project.
4. The Recipient shall participate in a Project Closeout Meeting to be held at the NETL facility located in Pittsburgh, PA or Morgantown, WV (or at an alternative location to be agreed upon by the DOE and Recipient) within the final 60 days of the agreement. The Recipient shall, as part of that meeting, prepare and present a summary of project efforts, findings and conclusions in the context of planned research and project objectives.

END of SOPO FORMAT

Justification of Project Tasks and Subtasks

This section should provide a logical justification for each task or subtask and the likelihood that the tasks/subtasks, as defined, will result in achieving the expected outcome or product of that task or subtask. The Applicant should include a thorough discussion of how the task and subtask interrelate, how the results of tasks will be used in subsequent tasks, and how the planned approach will result in achieving the project objective.

2.2 Verification/Validation Efforts

The Applicant should explain how the specific research efforts identified in the SOPO are sufficient to verify/validate (1) the advances desired under the project and (2) the benefits of those advances.

2.3 Quality and Suitability of Facilities, Equipment, and Materials

Content should address the specific facilities, equipment and other resources necessary to conduct the activities defined within the SOPO as well as the availability or accessibility of those resources to the applicant.

5. 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 research. Provide any information describing the other resources available to the project such as machine and electronics shops.
6. 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.

2.4 Project Schedule/Timeline and Milestones

Provide a schedule of the project (similar to the example Gantt chart below) broken down by Phase / Budget period and by Task / Subtask identified in the SOPO (Section 2.1 above). The schedule should include a start and an end date for each Phase / Budget period. Each Task / Subtask should also be identified with a start date, and an end date. The schedule should show interdependencies between tasks and include the milestones that are identified below.

Example Project Schedule

Provide milestones for each budget period (or phase) of the project, and describe the relationship to specific Tasks / Subtasks identified in the SOPO (Section 2.1 above). Each milestone should include a title, planned completion date, and the method/measure used to verify completion of the milestone. Milestones should be quantitative and show progress toward budget period and/or project goals. The Applicant shall identify those milestones that represent critical path milestones (no less than 2 per calendar year) which must be met prior to the project proceeding to subsequent activities.

Format for the milestone log should be as follows:

Title: {Milestone Title}
Planned Date: {Planned Completion Date}
Verification Method: {Milestone Verification Method}

3. Management Approach and Capabilities

In this section the Applicant shall provide detailed information, as outlined in the preceding Table of Contents, that will allow DOE reviewers to score the application based on Criterion 3 identified in Section V. Content of this section is intended to address the approach to managing the proposed research, structure of the project organization and qualifications of applicants and proposed key personnel.

3.1 Project Organizational Structure; Roles and Responsibilities

The Applicant should depict the overall structure planned for the project team including relationships among participating organizations.

Role of Participants: For multi-organizational or multi-investigator project structures, describe the roles and the research to be performed by each participant/investigator, the degree to which each partner provides value added towards achieving the overall objective(s), the business agreements between the applicant and participants, and how the various efforts will be integrated and managed.

Roles and Responsibilities of Key Personnel: The Applicant should clearly delineate and describe the roles and responsibilities of key personnel assigned to the project team.

3.2 Organizations' Corporate Experience in Managing Similar Projects

The Applicant should provide information relevant to the organization's capabilities and experience in managing technical projects of similar nature and complexity, including specific examples that demonstrate the ability to successfully meet research objectives within scope, budget and schedule. Depending on their role, relevant information for subcontractors and consultants should also be provided.

3.3 Knowledge, Capabilities, Experience, and Availability of Key Personnel

The knowledge, capabilities, experience (technical and managerial), and availability of the key personnel to be assigned to the project shall be provided and the percentage of time each would devote to the project should be clearly identified. Resumes of key project personnel shall

be included in the RESEARCH AND RELATED Senior/Key Person file (See Section IV.C.3 of this FOA).

The Applicant shall provide a table and justification for the estimated labor hours and labor categories (e.g., project manager, principal investigator, engineer, technician, scientist, clerical, etc.) required for each task and subtask in the Statement of Project Objectives (section 2.1 above). The table and justification shall include labor hours and labor categories for any proposed subcontracting or consulting effort for each task and subtask. These categories should be easily cross-referenced with the key personnel, and should agree with labor hours identified in the separate "RESEARCH AND RELATED BUDGET" form submitted under SECTION IV, Section C, subsection 4 of this FOA.

3.4 Technology Transfer

The Applicant shall describe how results of the proposed research will be made available to the DOE, the targeted industry segment, and to the greater scientific community. The technology transfer plan shall specifically identify and describe the method and frequency in which the product or information resulting from the research will be made available to the public in general and where applicable, shall detail recipient preferences for intellectual property rights. DOE prefers to maximize public availability of information and/or products resulting from the effort (specifically for non-profit / academic organizations). As such, maximizing the information / product availability will be considered a positive attribute when evaluating the technology transfer plan.

(End of Project Narrative)

Other Attachments (Field 12 on the form)

If you need to elaborate on your responses to questions 1-6 on the "Other Project Information" document, attach a file in field 12.

Also, attach the following files:

Commitment Letters

Commitment Letters for Field Research

For applications where activities will be carried out on land owned by a third party (i.e., a party other than the organization submitting the application), the Applicant should provide a permission statement to be included as part of a signed letter of commitment or as a separate document. Under 31 USC 1341, the Government cannot provide indemnification for possible damage to third party-owned property resulting from project-related activities. The permission statement needs to provide the property owner's authorization for use of the land and demonstrate a clear understanding that the Government cannot provide indemnification.

Commitment Letters from Third Parties Contributing to Cost Sharing

If a third party (i.e., a party other than the organization submitting the application) proposes to provide all or part of the required cost sharing, the applicant must include a letter from the third party stating that it is committed to providing a specific minimum dollar amount of cost sharing. The letter should also identify the proposed type of cost sharing (e.g., cash, services, and/or property) to be contributed. Letters must be signed by the person authorized to commit the entity and be provided in a PDF format. Save this information in a single file named "CLTP.pdf" and click on "Add Attachments" in Field 12 to attach.

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

If a DOE FFRDC contractor or DOE National Laboratory is to perform a portion of the work, you must provide a DOE Field Work Proposal in accordance with the requirements in DOE Order 412.1 Work Authorization System. This order and the DOE Field Work Proposal form are available at <https://www.directives.doe.gov/directives/current-directives/412.1-BOrder-a/view>. Use the FFRDC name as the file name (up to 10 letters) and attach to the R&R Other Project Information form in Field 12 - Add Attachments.

Environmental Questionnaire

You must complete the environmental questionnaire (EQ) for each performing organization and for each geographic location where activities will be conducted for the project. This will facilitate a National Environmental Policy Act (NEPA) determination by DOE for the project activity site(s). The EQ is available for download at the following website:
http://www.netl.doe.gov/business/forms/451_1-1-3.pdf.

Save the questionnaire in a single file (even if multiple work sites require multiple EQs) named "Env.pdf" and then attach it to the RESEARCH AND RELATED Other Project Information form. Click on "Add Attachments" in Field 12 to attach.

NOTE: This funding opportunity announcement will allow the use of DOE and cost share project funds for active hydraulic fracturing as part of the application. Applications that include hydraulic fracturing as part of the project could require performance of an Environmental Assessment (EA) for such activities, and the time required for the performance of that type of environmental review/analysis (typically 6-9 months) may preclude award of these projects prior to the end of the current Fiscal Year (September 30, 2013) or a delay in the initiation of field work. Activities such as data collection, monitoring, bench scale laboratory activities, data evaluation, and modeling of hydraulic fracturing operations are not anticipated to require an EA.

3. RESEARCH AND RELATED SENIOR/KEY PERSON

Complete this form before the Budget form to populate data on the Budget form. Beginning with the PD/PI, provide a profile for each senior/key person proposed. A senior/key person is any individual who contributes in a substantive, measurable way to the scientific/technical development or execution of the project, whether or not a salary is proposed for this individual.

Subrecipients and consultants must be included if they meet this definition. For each senior/key person provide:

Biographical Sketch. Complete a biographical sketch for each senior/key person and attach to the "Attach Biographical Sketch" field in each profile. The biographical information for each person must not exceed 3pages when printed on 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right) with font not smaller than 11 point and must include:

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

Research and 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.

Current and Pending Support

Provide a list of all current and pending support (both Federal and non-Federal) for the Project Director/Principal Investigator(s) (PD/PI) and senior/key persons, including subrecipients, for ongoing projects and pending applications. For each organization providing support, show the total award amount for the entire award period (including indirect costs) and the number of person-months per year to be devoted to the project by the senior/key person. Concurrent submission of an application to other organizations for simultaneous consideration will not prejudice its review. Save the information in a separate file and attach to the "Attach Current and Pending Support" field in each profile.

4. RESEARCH AND RELATED BUDGET (TOTAL FED + NON-FED)

Complete the Research and Related Budget (Total Fed & Non-Fed) form in accordance with the instructions on the form and the following instructions. You must complete a separate budget for each year of support requested. The form will generate a cumulative budget for the total project period. You must complete all the mandatory information on the form before the NEXT PERIOD button is activated. You may request funds under any of the categories listed 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).

NOTE: Fees and/or profits are NOT considered allowable costs in Financial Assistance Agreements.

Budget Justification (Field K on the form).

Attach a single budget justification file for the entire project period in Field K. The file automatically carries over to each budget year.

Budget Justification Guidelines

The following budget detail is required for both the DOE Share and Recipient Cost Share:

PERSONNEL -- In support of the proposed personnel costs, provide a supplemental schedule that identifies the labor hours, labor rates, and cost by labor classification for each budget year. Also indicate the basis of the labor classification, number of hours, and labor rates. An example of the basis for the labor classification and number of hours could be past experience, engineering estimate, etc. An example of the basis for the labor rates could be actual rates for the individuals who will perform the work or an average labor rate for the labor classification or a departmental average rate.

FRINGE BENEFITS -- Provide the method used to calculate the proposed rate amount. If a fringe benefit has been negotiated with, or approved by, a Federal Government agency, provide a copy of the agreement. If no rate agreement exists, provide a detailed list of the fringe benefit expenses (e.g., payroll taxes, insurances, holiday and vacation pay, bonuses) and their associated costs. Identify the base for allocating these fringe benefit expenses.

TRAVEL -- For each proposed trip, provide the purpose, number of travelers, travel origin and destination, number of days, and a breakdown of costs for airfare, lodging, meals, car rental, and incidentals. The basis for the airfare, lodging, meals, car rental, and incidentals must be provided, such as past trips, current quotations, Federal Travel Regulations, etc. **Note:** For profit recipients are required to comply with the GSA Federal Travel Regulation rates.

EQUIPMENT -- Provide an itemized list of each piece of equipment, its unit costs, and the basis for estimating the cost, for example, vendor quotes, catalog prices, prior invoices, etc.

SUPPLIES -- Provide an itemized list of supplies; identify the quantity of each item, its unit cost, and the basis for estimating the cost, for example, vendor quotes, catalog prices, prior invoices, etc.

CONTRACTUAL -- Identify proposed subaward/consultant work and the cost of each subaward/consultant. Provide a detailed budget for each subawardee that is expected to perform work estimated to be \$100,000 or more, or 50% of the total work effort, whichever is less. The subawardee budget should include the same level of detail as that of the applicant (i.e., by Object Class Category/Cost Classification). In addition, the following information must be provided:

CONSULTANTS -- Provide the hourly or daily rate along with the basis for the rate. Furnish resumes or similar information regarding qualifications or experience. Provide a statement signed by the consultant certifying his or her availability and that the rate proposed represents

its 'most favored customer' rate. If travel or incidental expenses are to be charged, give the basis for these costs.

SUBCONTRACTORS -- Identify each planned subcontractor and its total proposed budget. Each subcontractor's budget and supporting detail should be included as part of the Applicant's budget narrative. In addition, the Applicant shall provide the following information for each planned subcontract: a brief description of the work to be subcontracted; the number of quotes solicited and received; the cost or price analysis performed by the Applicant; names and addresses of the subcontractors tentatively selected and the basis for their selection; i.e. low bidder, delivery schedule, technical competence; type of contract and estimated cost and fee or profit; and, affiliation with the Applicant, if any.

CONSTRUCTION -- Provide detail of construction costs, if applicable.

OTHER DIRECT COSTS -- Provide an itemized list with costs for any other item proposed as a direct cost and state the basis for each proposed item.

INDIRECT COSTS -- If indirect rates have been negotiated with or approved by a Federal Government agency, please provide a copy of the latest rate agreement. If you do not have a current rate agreement, submit an indirect cost rate proposal which includes the major base and pool expense groupings by line item and dollar amount. In either case, provide a breakdown of the proposed indirect costs for each of your accounting periods included in the proposal. Identify the rate and allocation base for each indirect cost, such as Overhead, General and Administrative, Facilities Capital Cost of Money, etc.

COST SHARING -- Identify the percentage level and source of cost sharing for the proposed project. Identify if the cost share is cash or in-kind cost share. If in-kind, provide details. You must supply a letter from each third party contributing cost sharing stating that the third party is committed to providing a specific minimum dollar amount of cost sharing.

If cost sharing is applicable, completion of the following table is requested:

Provide the complete name of Organization	Dollar Amount of Cost Share	Percentage of Total Project Costs	Nature/Description of Cost Share
Recipient:			
Third Party*			
Third Party			
Third Party			
Third Party:			
Third Party:			
(Add further sources as needed)			
Total Recipient Cost Share			

* Third Party-a non-federal legal entity other than the recipient (i.e., sub-recipient, participant)

5. R&R SUBAWARD (TOTAL FED + NON-FED) FORM

Budgets for Subrecipients, other than DOE FFRDC Contractors. You must provide a separate cumulative R&R budget for each subrecipient that is expected to perform work estimated to be more than \$100,000 or 50 percent of the total work effort (whichever is less). Download the R&R Budget Attachment from the R&R SUBAWARD BUDGET (Total Fed + Non-Fed) FORM and e-mail it to each subrecipient that is required to submit a separate budget. After the Subrecipient has e-mailed its completed budget back to you, attach it to one of the blocks provided on the form. Use up to 10 letters of the subrecipient's name as the file name.

Subrecipient budget justification documentation must include the following breakdown information

1. Identify key persons and personnel categories and the estimated costs for each person or category; provide a list of equipment and cost of each item;
2. Identify proposed subaward/consultant work and cost of each subaward/consultant; describe purpose of proposed travel, number of travelers, and number of travel days;
3. List general categories of supplies and amount for each category;
4. Provide any other information you wish to support your budget.
5. Provide the name of your cognizant/oversight agency, if you have one, and the name and phone number of the individual responsible for negotiating your indirect rates

6. PROJECT/PERFORMANCE SITE LOCATION(S)

Indicate the primary site where the work will be performed. If a portion of the project will be performed at any other site(s), identify the site location(s) in the blocks provided.

Note that the Project/Performance Site Congressional District is entered in the format of the 2 digit state code followed by a dash and a 3 digit Congressional district code, for example VA-001. Hover over this field for additional instructions.

Use the Next Site button to expand the form to add additional Project/Performance Site Locations.

7. DISCLOSURE OF LOBBYING ACTIVITIES (SF-LLL)

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

8. SUMMARY OF REQUIRED FORMS AND FILES

Your application must include the following documents:

Name of Document	Format	Attach to
SF 424 (R&R)	Form	N/A
RESEARCH AND RELATED Other Project Information	Form	N/A
Project Summary/Abstract	PDF	Field 7
Project Narrative, including required appendices	PDF	Field 8
Budget for DOE FFRDC, if applicable	PDF	Field 12
Commitment Letters from Third Parties	PDF	Field 12
Environmental Questionnaire	PDF	Field 12
RESEARCH & RELATED SENIOR/KEY PERSON Profile (Expanded)	Form	N/A
Biographical Sketch	PDF	Attach to appropriate block

Current and Pending Support	PDF	Attach to appropriate block
RESEARCH AND RELATED BUDGET (Total Fed + Non-Fed)	Form	N/A
Budget Justification	PDF	Field K
R&R SUBAWARD BUDGET (Total Fed + Non-Fed), ATTACHMENT(S) FORM, if applicable	Form	N/A
PROJECT/PERFORMANCE SITE LOCATION(S)	Form	N/A
SF-LLL Disclosure of Lobbying Activities, if applicable	Form	N/A

D. SUBMISSIONS FROM SUCCESSFUL APPLICANTS

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

- Indirect cost information
- Other budget information
- Name and phone number of the Designated Responsible Employee for complying with national policies prohibiting discrimination (See 10 CFR 1040.5)
- Representation of Limited Rights Data and Restricted Software, if applicable

E. SUBMISSION DATES AND TIMES

1. Pre-application Due Date

Pre-applications are not required.

2. Application Due Date

Applications should be received by **June 17, 2013**, not later than **11:59:59 PM Eastern Time**. You are encouraged to transmit your application well before the deadline. The Grants.gov Helpdesk is available for extended periods; please check their website for the Helpdesk hours of operation. APPLICATIONS RECEIVED AFTER THE DEADLINE WILL NOT BE REVIEWED OR CONSIDERED FOR AWARD.

F. INTERGOVERNMENTAL REVIEW

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

G. FUNDING RESTRICTIONS

Funding for all awards and future budget periods are contingent upon the availability of funds appropriated by Congress for the purpose of this program and the availability of future-year budget authority.

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

Pre-award Costs. Recipients may charge to an award resulting from this announcement pre-award costs that were incurred within the ninety (90) calendar day period immediately preceding the effective date of the award, if the costs are allowable in accordance with the applicable Federal cost principles referenced in 10 CFR 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.

Pre-award costs are subject to the following:

- For awards with Educational Institutions: Consistent with OMB Circular A-21, educational institutions may not incur pre-award costs prior to award, without prior approval of the DOE Contracting Officer.
- For awards with State or Local Governments: Consistent with OMB Circular A-87, State or Local Governments may not incur pre-award costs prior to award, without prior approval of the DOE Contracting Officer.
- For awards with Other Non-Profit Recipients (not including hospitals): Consistent with OMB Circular A-122, other non-profit recipients may not incur pre-award costs prior to award, without prior approval of the DOE Contracting Officer.
- For awards with For-Profit Recipients: Consistent with 10 CFR 600.317, for-profit 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 allowable in accordance with the applicable Federal cost principles referenced in 10 CFR 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 including if for any reason the applicant does not receive an award or if the award is made for a lesser amount than the applicant expected.

H. OTHER SUBMISSION AND REGISTRATION REQUIREMENTS

1. Where to Submit

APPLICATIONS MUST BE SUBMITTED THROUGH GRANTS.GOV TO BE CONSIDERED FOR AWARD.

Submit electronic applications through the "Apply for Grants" function at www.Grants.gov. If you have problems completing the registration process or submitting your application, call Grants.gov at 1-800-518-4726 or send an email to support@grants.gov.

2. Registration Process

One Time Registration Process

You must COMPLETE the one-time registration process (all steps) before you can submit your first application through Grants.gov (See http://www.grants.gov/applicants/get_registered.jsp). We recommend that you start this process at least six weeks before the application due date. It may take 44 days or more to complete the entire process. Use the Grants.gov Organizational Registration Checklists at <http://www.grants.gov/assets/OrganizationRegCheck.pdf> to guide you through the process. IMPORTANT: During the SAM registration process, you will be asked to designate an E-Business Point of Contact (EBIZ POC). The EBIZ POC must obtain a special password called "Marketing Partner Identification Number" (MPIN). When you have completed the process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e., Grants.gov registration).

3. Application Receipt Notices

After an application is submitted, the Authorized Organization Representative (AOR) will receive a series of four e-mails. It is extremely important that the AOR watch for and save each of the emails. It may take up to two (2) business days from application submission to receipt of email Number 2. The titles of the four e-mails are:

Number 1 - Grants.gov Submission Receipt Number

Number 2 - Grants.gov Submission Validation Receipt for Application Number

Number 3 - Grants.gov Grantor Agency Retrieval Receipt for Application Number

Number 4 - Grants.gov Agency Tracking Number Assignment for Application Number

Section V - APPLICATION REVIEW INFORMATION

A. CRITERIA

1. Initial Review Criteria

Prior to a comprehensive merit evaluation, DOE will perform an initial review to determine: that 1) the application is eligible for an award, 2) the information required by the announcement has been submitted, and 3) all mandatory requirements are satisfied. If an applicant fails the initial review process, notification will be made to the Technology Manager and Director of the Office

of Natural Gas & Oil Project Management. Notification will include identification of review criteria that was found to be inadequate.

2. Merit Review Criteria

All applications that pass the initial review process will receive a detailed and consistent technical evaluation utilizing the evaluation criteria described below. The Evaluation Criteria below will be applied to all topic areas.

Criterion 1 - Scientific and Technical Merit (55%)

1. The degree to which the Applicant clearly conveys the nature and significance (scientific, economic, etc.) of the problem being addressed in the application, and the limitations of the current state of knowledge or technology relative to addressing the problem.
2. The degree to which the proposed research is both based on sound scientific and engineering principles and designed to overcome limitations or make advances to ongoing research and/or the current state of technology, knowledge or capabilities and the significance of these advances.
3. The degree to which the proposed project is relevant to the DOE's goals and objectives of the funding opportunity announcement and the specific topic area under which the project is proposed.
4. The clarity and thoroughness by which the Applicant has identified the potential benefits of the proposed research and, to the extent possible, quantified the potential benefits in terms of additional recovery, reduced costs or improved economics, resolving environmental barriers, or other benefits.
5. The degree to which the Applicant demonstrates the need for Federal involvement and the likelihood that the proposed research will not be undertaken by industry in the near term and/or whether federal involvement could result in acceleration of findings, reduction in risk or broader public benefit.
6. The degree to which the applicant demonstrates that proposed research is not duplicative of current research being conducted by industry, academia, or others.

Criterion 2 - Technical Approach (30%)

7. Appropriateness, clarity, and completeness of the overall Statement of Project Objectives as well as the rationale for each task and subtask. The adequacy, feasibility, and logic of the Applicant's technical approach for achieving the stated project objectives.
8. The degree to which the technical approach includes specific efforts and the significance of those efforts (e.g., numerical analyses, laboratory experiments, field tests) to verify/validate the advances in knowledge or technology made through the research and/or the benefits/impacts of those advances.
9. The adequacy and availability of facilities and equipment required to perform project tasks and meet the project objectives.
10. The adequacy and logic of the proposed schedule / timeline, including critical path milestones, and the likelihood that the milestones will be successfully met based on the proposed technical approach.

Criterion 3 - Management Approach and Capabilities (15%)

11. The degree to which the Applicant clearly describes the organizational structure of the project team and clearly defines the roles and responsibilities of the key personnel.
12. The adequacy and relevance of the Applicant's and any participating organization's corporate experience in managing projects of similar nature and complexity, within budget and on schedule and the Applicant's documentation of this capability within the proposal through citation of specific examples.
13. The knowledge, capabilities, experience, and availability of key personnel for the successful completion of individual tasks and the overall project, and justification and appropriateness of proposed labor hours for completing Tasks / Subtasks (including a listing of key project personnel and the percentage of their time committed to the proposed research).
14. The adequacy of the proposed technology transfer plan and the method by which project information and data is to be made available to DOE and the public in a timely manner.

3. Other Selection Factors

Program Policy Factors

The selection official will consider program policy factors in the selection process. These factors, while not indicators of the Application's merit, e.g., technical excellence, cost, applicant's ability, etc., may be essential to the process of selecting the applications(s) that, individually or collectively, will best achieve the program objectives. Program policy factors may be used by the Source Selection Official to select projects when such selection is deemed likely to result in a superior overall research and development portfolio.

- 1) It may be desirable to select for award a group of projects which represents a diversity of technical approaches and methods;
- 2) It may be desirable to support complementary and/or similar efforts or projects, which, when taken together, will best achieve the Program's research goals and objectives;
- 3) It may be desirable that different kinds and sizes of organizations be selected for award in order to provide a balanced programmatic effort and a variety of different technical perspectives;
- 4) It may be desirable, because of the type of projects envisioned or limitations of past efforts to select for award a group of projects with a broad or specific geographic location;
- 5) It may be desirable to select project(s) of less technical merit than other project(s) if such a selection (1) will optimize the use of available funds by allowing more projects to be supported, (2) will allow more timely completion of program goals, and (3) will reduce program

risks of accomplishing program goals, while not being detrimental to the overall objectives and goals of the program.

The above factors will be independently considered by the Selection Official in determining the optimum mix of applications that will be selected. These policy factors will provide the Selection Official with the capability of developing, from the competitive funding opportunity, a broad involvement of organizations and organizational ideas, which will both enhance the overall research effort and upgrade the program content to meet the goals of the DOE.

B. REVIEW AND SELECTION PROCESS

1. 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/management/office-management/operational-management/financial-assistance> under Financial Assistance Policy and Guidance.

2. Selection Official Consideration

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

3. Discussions and Award

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

C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES

DOE anticipates notifying applicants selected for award by August 31, 2013 and making awards by September 30, 2013.

Section VI - AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES

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.

2. Notice of Award

An 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, or, for Federal Demonstration Partnership (FDP) institutions, the FDP terms and conditions; (5) National Policy Assurances To Be Incorporated As Award Terms; (6) Budget Summary; 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 Title 2 CFR the Award also includes the Research Terms and Conditions 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 10 CFR 600 (See: <http://www.eCFR.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://www.eCFR.gov>). Prime awardees must keep their data at the System for Award Management (SAM) current at <http://www.sam.gov> current SAM is the government-wide system that replaced the CCR. If you had an active registration in the CCR, you have an active registration in SAM. 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://www.eCFR.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 System for Award Management (SAM).

2. Special Terms and Conditions and National Policy Requirements

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

The National Policy Assurances To Be Incorporated As Award Terms are located at <http://www.nsf.gov/bfa/dias/policy/rtc/appc.pdf> and at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms> under Award Terms.

Intellectual Property Provisions. The standard DOE financial assistance intellectual property provisions applicable to the various types of recipients are located at: <http://energy.gov/gc/standard-intellectual-property-ip-provisions-financial-assistance-awards>

Lobbying Restrictions. By accepting funds under this award, you agree that none of the funds obligated on the award shall be expended, directly or indirectly, to influence congressional action on any legislation or appropriation matters pending before Congress, other than to communicate to Members of Congress as described in 18 U.S.C. 1913. This restriction is in addition to those prescribed elsewhere in statute and regulation.

Corporate Felony Conviction and Federal Tax Liability Representations

In submitting an application in response to this FOA the Applicant represents 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) No officer or agent of the corporation have been convicted of a felony criminal violation for an offense arising out of actions for or on behalf of the corporation under Federal law in the past 24 months,

(3) 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.

For purposes of these representations the following definitions apply:

A Corporation includes any entity that has filed articles of incorporation in any of the 50 states, the District of Columbia, or the various territories of the United States [but not foreign corporations]. It includes both for-profit and non-profit organizations.

Foreign National Involvement

All applicants selected for an award resulting from this FOA may be required to provide information to the Department of Energy (DOE) in order to facilitate our responsibilities associated with foreign national access to DOE sites, information, technologies, and equipment. Foreign national is defined as any person who was born outside the jurisdiction of the United States, is a citizen of a foreign government, and has not been naturalized under U.S. law. If the selected applicant, including subrecipients/contractors, anticipates utilizing a foreign national person in the performance of an award, the selected applicant may be responsible for providing to the DOE representative specific information of the foreign national(s) to satisfy compliance with all of the requirements for access approval

Statement of Substantial Involvement

DOE will have substantial involvement to include the following:

1. Providing timely reviews of all project plans, technical reports, and other deliverables and providing comments to the Recipient as appropriate.
2. Participating in project management planning activities, including risk analysis, to ensure DOE's program requirements or limitations are considered in performance of the research elements.
3. Conducting frequent project/program review meetings to ensure adequate progress and that the research being conducted is within scope, schedule, and budget, and accomplishes the project objectives.
4. Integrating and facilitating the research effort (as required) to ensure that project results address critical system and programmatic goals established by DOE/FE in coordination with the DOE Natural Gas and Oil Program.

5. Reviewing Continuation Application material and concurring on project and task documentation prior to continuation into subsequent budget periods.
6. Promoting and facilitating technology transfer activities, including disseminating project results through presentations and publications.
7. Serving as the scientific/technical liaison between the Recipient and other program, procurement, or industry staff.

The Recipient's Responsibilities include the following:

1. Performing the activities supported by this award in accordance with the Project Management Plan, including providing the required personnel, facilities, equipment, supplies and services.
2. Managing, controlling, and reporting project activities in accordance with established processes and procedures to ensure tasks and subtasks are completed within scope and within the schedule and budget constraints defined by the current Project Management Plan.
3. Implementing an approach to identify, analyze, and respond to project risks that is commensurate with the complexity of the project.
4. Providing timely response and updates to the DOE Project Officer upon request.
5. Providing all deliverables specified in the award and incorporating DOE review comments in technical reports upon review.
6. Participating in all briefings and presenting project results at appropriate technical conferences or meetings as specified by the SOPO.

C. REPORTING

Reporting requirements are identified on the Federal Assistance Reporting Checklist, DOE F 4600.2, attached to the award agreement. The checklist is available at:
<http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms> under Award Forms.

Section VII - QUESTIONS/AGENCY CONTACTS

A. QUESTIONS

Questions regarding the content of the announcement must be submitted through the FedConnect portal. You must register with FedConnect to respond as an interested party to submit questions, and to view responses to questions. It is recommended that you register as soon after release of the FOA as possible to have the benefit of all responses. DOE will try to respond to a question within 3 business days, unless a similar question and answer have already been posted on the website.

Questions and comments concerning this FOA shall be submitted not later than June 10, 2013, calendar days prior to the application due date. Questions submitted after that date may not allow the Government sufficient time to respond.

Questions relating to the registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov. DOE/NNSA cannot answer these questions.

B. AGENCY CONTACT

Name: Carla Winaught
E-mail: Carla.Winaught@netl.doe.gov

Questions: **All questions shall be submitted in writing as outlined above through FedConnect.**

FOA Questions should not be submitted via the

above email and FOA questions will not be answered via the above email or via phone calls.

Section VIII - OTHER INFORMATION

A. MODIFICATIONS

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

B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE

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

Funding for all awards and future budget periods are contingent upon the availability of funds appropriated by Congress for the purpose of this program and the availability of future-year budget authority.

D. PROPRIETARY APPLICATION INFORMATION

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

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

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

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

E. EVALUATION AND ADMINISTRATION BY NON-FEDERAL PERSONNEL

In conducting the merit review evaluation, the Government 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.

Program Covered Under Special Protected Data

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, anticipated for a period of up to two (2) years from the development of the information, of data that would be trade secret, or commercial or financial information that is privileged or confidential, if the information had been obtained from a non-Federal party. Generally, the provision entitled, Rights in Data Programs Covered Under Special Protected Data Statutes (10 CFR 600 Appendix A to Subpart D), would apply to an award made under this announcement. This provision will identify data or categories of data first produced in the performance of the award that will be made available to the public, notwithstanding the statutory authority to withhold data from public dissemination, and will also identify data that will be recognized by the parties as protected data.

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 at <http://energy.gov/gc/patents-licensing-and-patent-waivers> under the Patent Waivers.

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. FOREIGN ENTITY WAIVER REQUEST

As set forth in Section III.A.3, all prime recipients receiving funding under this FOA must be incorporated (or otherwise formed) under the laws of a State or territory of the United States. If a foreign entity applies for funding as a prime recipient, it must designate a subsidiary or affiliate incorporated (or otherwise formed) under the laws of a State or territory of the United States to be the prime recipient.

To request a waiver for this requirement, the Applicant must submit a waiver request in the Full Application, which includes the following information: entity name, country (or state) of incorporation, description of the work to be performed by that entity, and the location where the work will be performed. If the applicant is seeking a waiver to have a foreign entity serve as the prime recipient, the applicant must explain why it is necessary to have a foreign entity serve as the prime recipient. Waiver requests should explain how the waiver would further the purposes of this FOA and otherwise serve the interests of the Department of Energy. The Contracting Officer may require additional information before considering the waiver request. Save the Waiver Request(s) in a single file titled:
"LeadOrganization_Waiver.pdf"