

**FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT**



**U.S. Department of Energy
Golden Field Office**

Recovery Act: High Penetration Solar Deployment

Topic Area 1: Improved Modeling Tools Development

Topic Area 2: Field Verification of High-Penetration Levels of PV into the
Distribution Grid

Topic Area 3: Modular Power Architecture

Topic Area 4: Demonstration of PV and Energy Storage for Smart Grids

Funding Opportunity Announcement Number: DE-FOA-0000085

Announcement Type: Modification 001

CFDA Number: 81.087 Renewable Energy Research and Development

Issue Date: May 27, 2009

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

NOTE: Questions regarding the content of this announcement must be submitted through FedConnect. Applicants must be registered in FedConnect to submit or view Questions.



**Department of
Energy**

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DE-FOA-0000085
Modification No. 001

DATE: May 27, 2009
FROM: Andrea K. Lucero, Contracting Officer
TO: All Prospective Applicants

SUBJECT: Modification No. 001 to Announcement DE-FOA-0000085,
"Recovery Act: High Penetration Solar Deployment"

The purpose of this modification is to reflect the correct due date of 07/30/2009 in FedConnect. There are no modifications to the Announcement.

APPLICATION SUBMISSION, FEDCONNECT QUICK START GUIDE, REGISTRATION REQUIREMENTS, AND WHERE TO SUBMIT QUESTIONS

1. Application Submission

APPLICATIONS MUST BE SUBMITTED THROUGH FEDCONNECT AT <https://www.fedconnect.net/> TO BE CONSIDERED FOR AWARD. The Adobe Application Package identified in Section IV. C. is posted as an attachment to this FOA (in FedConnect). It is the responsibility of the applicant, prior to the Application due date and time, to verify successful transmission.

In the Adobe Application Package that is provided as a separate attachment to this announcement in FedConnect, first attach your application documents within the Adobe Application Package. Then save the Adobe Application Package, and submit it via the FedConnect portal. **IMPORTANT: DO NOT** use the “Save & Submit” button in the Adobe Application Package, since that button is only used when submitting an application in Grants.gov.

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

2. Electronic Authorization of Applications and Award Documents

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

Acknowledgment of award documents, including modifications, through electronic systems used by the Department of Energy, including FedConnect, constitutes the authorized representative’s acceptance of the terms and conditions of the award. Acknowledgment via FedConnect constitutes the authorized representative’s electronic signature.

3. FedConnect Quick Start Guide:

Use this guide to assist you with FedConnect:

https://www.fedconnect.net/FedConnect/PublicPages/FedConnect_Ready_Set_Go.pdf

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

- A. Your company’s DUNS (including plus 4 extensions if applicable). If you don’t know your company’s DUNS or if your company does not have a DUNS you can search for it or request one at <http://fedgov.dnb.com/webform/displayHomePage.do> .
- B. A federal Central Contractor Registration (CCR) account. If your company is not currently registered with CCR, please register at www.ccr.gov before continuing with your FedConnect registration.
- C. Possibly, your company’s CCR Marketing Partner Identification Number (MPIN). If you are the first person from your company to register, FedConnect will need to create a company account. Only a person who knows your company’s CCR MPIN can do this. To find out who this is in your company, go to <http://www.ccr.gov/> and click **Search CCR**. Once you’ve found your company, locate the Electronic Business Point of Contact.

After the initial FedConnect account is created, employees can register themselves without the MPIN. If you are not sure whether your company has an account with FedConnect, don't worry. Complete the registration form and FedConnect will let you know. (PLEASE REFER TO THE FEDCONNECT QUICK START GUIDE FOR QUESTIONS)

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

5. Adobe Application Package - Instructions for Completion of Forms

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

- 1) Copy the Adobe Application Package to your desktop;
- 2) Open the Adobe Application Package, and first complete the SF-424 Application, Project/Performance Site Location(s) form, and SF-LLL form (if applicable) which are all part of the Adobe Application Package. To start this process, simply click on the form's name to select the item and then click on the => button. This will move the document to the appropriate "Documents for Submission" box and the form will be automatically added to your application package. Open the forms by selecting the form name and clicking on the "Open Form" button, then complete the required data fields.
- 3) Identify the remaining forms required to be completed, as identified in Part IV of the Announcement. Prepare and save these forms to your desktop (e.g., project narrative, resume file, budget file, ...). Once finalized and files are named as indicated in Part IV of the Announcement, upload (attach) these files individually within the Adobe Application Package by clicking on "Add Mandatory Other Attachment" to attach the Project Narrative and clicking on "Add Optional Other Attachment" to attach the remaining files;
- 4) Once all completed files have been attached within the Adobe Application Package, save the Adobe Application Package to your desktop, and submit to FedConnect, following the steps outlined in the FedConnect Quick Start Guide at: https://www.fedconnect.net/Fedconnect/PublicPages/FedConnect_Ready_Set_Go.pdf. Note that Applications may be submitted to multiple Topic Areas; however, SEPARATE applications must be submitted for each Topic Area. If submitting to multiple Topic Areas, save the Adobe Application Package in a single file, using up to 10 letters of the Applicant's Organization Name as the file name (e.g., ABC Corp). If your organization is submitting more than one Application to different topic areas, you must identify an application number and the Topic Area Number at the end of each file name (e.g., ABC Corp-1-Topic1).

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

6. Questions

Questions regarding the content of the announcement must be submitted through the FedConnect

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

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

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PART I – FUNDING OPPORTUNITY DESCRIPTION

A. INTRODUCTION: AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009

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

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

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

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

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

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

recipient's compliance with the requirements.

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

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

Background

The mission of the Department of Energy's (DOE) Solar Energy Technologies Program (SETP) is to conduct research, development, demonstration, and deployment (RDD&D) activities to accelerate widespread commercialization of clean solar energy technologies across America, diversifying the Nation's electricity supply options while increasing national security and improving the environment.

The SETP structures its RDD&D activities into four subprogram areas: Photovoltaics (PV), Concentrating Solar Power (CSP), Systems Integration, and Market Transformation. One of the goals of the Systems Integration subprogram is to address challenges facing high penetration solar electricity generation, which includes both PV and CSP, into the electric power system.

This Funding Opportunity Announcement (FOA) only addresses the impacts from PV-sourced solar electricity. As solar electricity continues to gain its share in the U.S. electricity generation mix, it becomes increasingly important to better understand the effects of high-penetration solar electricity on the reliability and stability of the electric power system. High penetration on the grid is defined differently for different utilities and for different distribution systems within each utility grid.

The improved understanding of the effects of high-penetration solar electricity on the reliability and stability of the electric power system will allow solar electricity to be on an even playing field with other generation resources in an integrated resources planning process and will allow solar electricity to be fully integrated into power system operations, from serving local loads to serving as grid resources for the interconnected transmission and generation system. This full integration of solar electricity into the power system planning process and operations is needed to sustain or accelerate the fast growth trajectory experienced in recent years for the grid-tied solar energy systems.

The effects of high penetration of solar electricity will likely be experienced first from PV installations interconnected with the distribution grid, as described in the DOE Renewable Systems Interconnection (RSI) study reports.¹ In recent years, a limited number of PV installation sites in the U.S. have reached significant PV penetration levels and their effects on the reliability of grid operations are beginning to be monitored by the DOE and its partner organizations. These penetration levels, for example, range from 3% in the Anatolia III subdivision in Rancho Cordova, California, with 91 Solar Smart homes having a 2 kW PV

¹ Fourteen RSI topic reports and an Executive Summary are available at http://www1.eere.energy.gov/solar/solar_america/rsi.html.

installation each, to 260% in an 8 MW PV power plant in Alamosa, Colorado, serving normal agriculture loads. Another example is the 14 MW PV plant at Nellis Air Force Base, Nevada, with 70,000 PV panels, which is currently the largest PV power plant in North America. This system supplies over 25% of the power used by 12,000 military personnel and civilians.

Although examples of high penetration PV on a distribution system exist, there are far too few occurrences and even fewer representative case studies to have a clear and documented understanding of the impacts that are available to the stakeholder community. Better understanding of the effects of PV penetration levels on grid operations with respect to different distribution circuit characteristics (circuit designs, load and generation mixes, etc.) is needed for broad acceptance of high-penetration PV levels in distribution systems throughout the country.

To better define both the technical challenges facing high penetration PV into the distribution grid and the research and development (R&D) activities needed to overcome the challenges, the DOE convened experts and practitioners in a workshop on February 24-25, 2009, in Ontario, California.² Information from this workshop, as well as information from the earlier RSI study reports, was used to guide the development of this FOA.

Objectives

The objectives of this FOA are to 1) develop the needed modeling tools and database of experience with high penetration scenarios of PV on a distribution system, 2) develop monitoring, control and integration systems to enable cost-effective widespread deployment of small modular PV systems and 3) demonstrate the integration of PV and energy storage into Smart Grid applications. This will accelerate the placement of high levels of PV penetration into existing or newly designed distribution circuits. The achievement of these goals will facilitate increased growth of grid-tied PV installations, thus supporting the SETP's mission to accelerate widespread commercialization of clean solar energy technologies in the United States (U.S.).

Scope

Successful implementation of the objectives requires both modeling tools and actual performance and validation data. Therefore, this FOA seeks projects for activities in four (4) topic areas: Topic Area 1 - Improved Modeling Tools Development; Topic Area 2 - Field Verification of High-Penetration Levels of PV into the Distribution Grid; Topic Area 3 - Modular Power Architecture; and Topic Area 4 - Demonstration of PV and Energy Storage for Smart Grids.

A team approach that includes members of PV suppliers and integrators and research institutes (universities and national laboratories) is preferred; participation of at least one electric utility³ is required in all Topic Areas.

Topic Area 1: Improved Modeling Tools Development.

² The workshop report is available at www.eere.energy.gov/solar/pdfs/pv_grid_penetration.pdf.

This report provides a compilation of technical barriers/issues, RD&D activities, and performance requirements identified in each of the four breakout team sessions.

³ A utility is defined as an electric municipal or investor-owned utility, or a rural electric cooperative.

Each project in response to Topic Area 1 must be planned in 12-month Phases. The project period may total up to 3 years. The project plan must include tool development, integration, and a minimum 12-month proof of concept and validation period.

Projects in Topic Area 1 should result in the improved ability to model the effects of high penetration solar electricity generation on the electric distribution system. Applications should address the development of enhanced PV performance models and their integration into existing distribution system planning and engineering analysis tools for improved analysis capabilities.

Current analytical tools used for distribution system planning and engineering analysis have begun to incorporate capabilities for modeling multiple distributed energy resources on the system. However, to accurately model the effects of high-penetration levels of PV on the system, these tools must be upgraded with appropriate PV performance models, and the fidelity of modeling results must be validated using simulations and field data. In addition, new or improved functionalities are required to analyze the dynamic performance of PV systems. These improved functionalities include the interactions with all other connected resources such as distributed generation, protection equipment, loads, demand response, and/or storage on a distribution feeder as well as the effect of the high penetration levels on the stability and reliability of distribution grid system operations. All these factors need to be included in new modeling tools.

Applications should address approaches for the enhanced PV performance models and should encompass new inverter models to better understand the performance of the various, and distinctly different, inverter designs for load flow analysis under normal and fault conditions as well as for planning applications such as short circuit current calculations. In addition, PV performance profiles (such as the fault contribution curve, rate of output change, islanding test results, etc.) should be incorporated into PV performance models. A requirement of the new and improved distribution system tools is that they be capable of dynamically analyzing the interactions of all distributed generators on a feeder to satisfy anti-islanding needs, as well as their interactions with protection equipment, loads, demand response, and/or different types of energy storage under varying operating conditions. Applicants should also describe how the proposed work will improve understanding of the effects of high-penetration levels of PV on the reliability indices such as the System Average Interruption Duration Index (SAIDI), System Average Interruption Frequency Index (SAIFI), Momentary Average Interruption Frequency Index (MAIFI), etc. Applicants must address how their solution will result in development of planning guidelines for determining PV penetration limits and circuit designs for high-penetration levels of PV.

In view of the various distribution system planning and engineering analysis tools currently in use today, Applicants must address how their improved models can be readily integrated into commonly-used system tools. Development of an open-source model is preferred. If any proprietary models are proposed, Applicants must provide open-source interfaces for integration with commercial distribution system tools.

Topic Area 2: Field Verification of High-Penetration Levels of PV into the Distribution Grid

Projects in response to Topic Area 2 are expected to consist of 3 to 5 12-month phases and include modeling, simulation, laboratory-level testing, test-bed testing, field testing and proof of concept validation, and collection of field performance data.

Applications in Topic Area 2 must address modeling as well as approaches for field testing and validation of high-penetration levels of PV on prototypical distribution circuits and on

new circuit configurations (including microgrids) for optimized technical and economic performance.

A prototypical distribution circuit denotes a grouping of currently existing distribution circuits sharing some common characteristics in circuit design, load and generation mixes, etc. as are commonly found in the U.S. Applications under Topic Area 2 must model and define such a system, and describe how that system would be built or modified to derive lessons-learned and best practices from the proof of concept testing. The resulting information from the proof of concept testing in the system is expected to be readily adopted by other locations sharing similar circuit characteristics.

Also of interest are verification of the models and equipment on newly-built circuits designed to accommodate high-penetration PV levels, as well as on microgrid configurations when using PV systems in combination with a variety of other distributed energy resources (such as wind, storage, and clean, energy-efficient engines and turbines, etc.) for improved power quality performance.

Various prototypical feeder circuits incorporating high penetration levels of PV and various microgrids in a range of climate conditions may be considered for field testing. Applications in this Topic Area should define the stages of development, from the modeling and simulation, to controlled-environment laboratory testing for design and operational feasibility, through testing at testbeds, to the eventual scale of field testing or proof of concept under real operating conditions.

In all cases, the model evaluation, testing and prototype validation must be conducted under high-penetration PV scenarios and effective solutions must include ALL of the following items:

- secured communications and control protocols between distributed PV systems and utility Supervisory Control and Data Acquisition/Energy Management System (SCADA/EMS),
- voltage regulation schemes,
- unintentional islanding prevention,
- intentional islanding/microgrid operation,
- false inverter trips due to utility line transients,
- reverse power flow in secondary network distribution systems,
- reactive power (VAr) control schemes for multiple inverters,
- fault contribution,
- coordinated protection and operations with other protection equipment, and
- effects of variable cloud cover on system stability.

Additionally, applicants to Topic Area 2 are encouraged to conduct hardware-in-the-loop testing of new products through integration of dynamic simulation tools for evaluating the effects of high-penetration PV and devising their solutions at the laboratory testing level. All prototype hardware and software must be evaluated at testbeds before field testing.

Proof of concept and field verification should also evaluate the effectiveness of PV systems in providing ancillary services (frequency and VAr support, regulation service, and stabilization of inter-model oscillations), as well as in enhancing overall system flexibility through integrated operations of PV, load management, and energy storage. The field verification projects that build on, or are conducted in conjunction with, SmartGrid projects to utilize those communication and control standards and protocols, as well as to conform to its interoperability framework, are encouraged.

A minimum of one year of field performance data must be collected to document the effects of high-penetration PV, the effectiveness of mitigation solutions, the lessons learned and best practices, with sufficient information to provide a detailed cost/benefit analysis.

Successful applications in Topic Area 2 must describe how the proposed proof of concept and field validation will verify how to mitigate impacts from high-penetration PV on the system, and how the planned effort will result in improved system designs and operating strategies for high-penetration PV. A successful Application must also describe how the resulting lessons learned and best practices will be disseminated for adaptation, or could be implemented on other circuits with similar characteristics.

Topic 3 - Modular Power Architecture

Each project in response to Topic Area 3 must be planned as one Phase and should be able to be completed in 12 months or less.

Applications are sought to demonstrate that low-cost, easy-to-install, modular and scalable power architecture can be deployed throughout the United States. Eligible technologies are ones that have been previously-demonstrated in utility test systems. Through this FOA, these successful test systems can be more broadly deployed across the United States. One or more projects will be sought to demonstrate that, once deployed, this modular power architecture can enable small photovoltaic systems to be easily integrated with utility systems. This distributed approach should demonstrate how higher levels of PV can be integrated into the electrical distribution network. Successful applicants will address integration, in a distributed fashion, of small (200-500 watt) modular PV systems with the utility grid.

Topic 4 - Demonstration of PV and Energy Storage for Smart Grids

Each project in response to Topic Area 4 must be planned as one Phase and should be able to be completed in 12 months or less.

Under this topic, applications are sought to integrate PV and energy storage into Advanced Metering Infrastructure (AMI) pilot programs. Expanding the amount of PV and energy storage technology integrated into homes or small businesses will essentially evolve these programs from AMI pilot into Smart Grid pilot. Successful applicants will address how PV, combined with energy storage, can be integrated into existing AMI programs (100,000 meter pilots or greater). Additionally, applicants should address how this will enable approaches such as advanced pricing and billing, including net metering and real-time pricing. In addition, applicants should address how such integration will impact businesses and homes during weather events, natural disasters, sabotage, equipment failure, or human error.

REQUIREMENTS:

- All project teams must include a utility partner.
- All projects must be planned with phases, not exceeding 12 months in duration. These projects may be incrementally funded. DOE will conduct a review of all projects awarded through this FOA upon completion of each phase. Project continuation into the succeeding phases (Topic 1 and 2) will depend on a satisfactory review by the DOE on

the project progress in meeting the scope, key milestones, go/no-go criteria, and the schedule and budget performance, as well as funding availability.

- Phase 1 of all topics will be funded through the American Recovery and Reinvestment Act of 2009. Phase 1 will be negotiated as a stand-alone Award. Subject to availability of funding, all future Phases (Topics 1 and 2 only) are planned to be negotiated as a separate agreement. Cost share and reporting requirements will differ between Phases. (SEE PART III B)
- The Application must include an attachment to the narrative with a statement of the number of jobs that will be provided in Phase 1 and a discussion of how it will be achieved. (SEE PART IV.C.3.b and, SECTION A. 1. REVIEW CRITERIA)

Special Instructions

- ***Applicants must indicate the Topic Area to which they are applying in their application narrative (e.g. Topic Area 1 Improved Modeling Tools Development; Topic Area 2 Field Verification of High-Penetration Levels of PV into the Distribution Grid; Topic Area 3 Modular Power Architecture; or Topic Area 4 Demonstration of PV and Energy Storage for Smart Grids). Failure to designate the Topic Area may result in the Application not receiving a comprehensive Merit Review.***
- **Applicants may submit applications to multiple Topic Areas; however, SEPARATE applications must be submitted for each Topic Area.** The Adobe Application Package is provided as a separate attachment to this Funding Opportunity Announcement (on FedConnect and Grants.gov). Save the Adobe Application Package in a single file, using up to 10 letters of the Applicant's Organization Name as the file name (e.g., ABC Corp). If your organization is submitting more than one Application to different topic areas, you must identify an application number and the Topic Area Number at the end of each file name (e.g., ABC Corp-1-Topic1).

PART II – AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT

- DOE anticipates awarding cooperative agreements under this FOA (See Part VI.B.4 Statement of Substantial Involvement).

B. ESTIMATED FUNDING

- Approximately \$17,500,000 is expected to be available for new awards for Phase 1 issued with Recovery Act Funds. Subject to availability of appropriated funding, an additional \$20,000,000 is expected to be available, distributed over the years FY 2010 through FY2014, for awards for the remaining Phases (Topics 1 and 2 only), subject to the availability of appropriated funds.

C. MAXIMUM AND MINIMUM AWARD SIZE

- Ceiling amounts (i.e., the maximum amount of federal funds estimated by phase for an individual award made under this announcement) are shown in the table below:

Maximum Federal Funding	Phase 1 (*)	Phase 2	Phase 3	Phase 4	Phase 5	Maximum/Award
Topic Area 1	\$500,000	\$500,000	\$750,000	\$0	\$0	\$1,750,000
Topic Area 2	\$600,000	\$800,000	\$800,000	\$800,000	\$600,000	\$3,600,000
Topic Area 3	\$7,500,000	\$0	\$0	\$0	\$0	\$7,500,000
Topic Area 4	\$5,000,000	\$0	\$0	\$0	\$0	\$5,000,000

(*) Phase 1 will be a separate award funded through the American Recovery and Reinvestment Act of 2009.

- Floor (i.e., the minimum amount for an individual award made under this announcement): NONE

D. EXPECTED NUMBER OF AWARDS

DOE anticipates making 9 to 13 awards under this announcement, depending on the topic area and the size of the awards. Approximately 4 awards are planned for Topic Area 1, 5 awards are planned for Topic Area 2, 1 award for Topic Area 3, and 1 award for Topic Area 4.

E. ANTICIPATED AWARD SIZE

Approximately 4 awards are planned for Topic Area 1 to total \$7,000,000 in Federal Funds, 5 awards are planned for Topic 2 to total \$18,000,000 in Federal Funds, 1 award is planned for Topic Area 3 to total \$7,500,000 in Federal Funds, and 1 award is planned for Topic Area 4 to total \$5,000,000 in Federal Funds, [which may be distributed in variable amounts by Phase.]

F. PERIOD OF PERFORMANCE

- Each project in Topic Area 1 may be up to 3 Phases of 12 months each. Each project in Topic Area 2 may be up to 5 Phases of 12 months each. Each project in Topic Area 3 may be 1 Phase up to 12 months in duration. Each project in Topic Area 4 may be 1 Phase up to 12 months in duration.
- **For Topic Areas 1 and 2, at the end of each Phase, DOE will conduct a detailed project review concluding with a go/no-go decision that will determine whether**

the award will continue to the next Phase. In the event that the award is continued to the next Phase, the following applies.

Continuation Application. A continuation application is a non-competitive application for an additional budget period within a previously approved project period. At least 90 days before the end of each budget period, you must submit to the DOE Project Officer and the DOE Award Administrator your continuation application, which includes the following information:

1. A report on your progress towards meeting the objectives of the project, including any significant findings, conclusions, or developments, and an estimate of any unobligated balances remaining at the end of the budget period. If the remaining unobligated balance is estimated to exceed 20 percent of the funds available for the budget period, explain why the excess funds have not been obligated and how they will be used in the next budget period.
2. A detailed budget and supporting justification for the upcoming budget period if additional funds are requested, a reduction of funds is anticipated, or a budget for the upcoming budget period was not approved at the time of award.
3. A description of your plans for the conduct of the project during the upcoming budget period, if there are changes from the DOE approved application.

Continuation Funding. Continuation funding is contingent on (1) availability of funds; (2) meeting the objectives, milestones, deliverables, decision point criteria, and stage gates of your approved project and obtaining approval from DOE to continue work on the project; (3) submittal of required reports; and/or (4) compliance with the terms and conditions of the award.

Continuation funding is specifically contingent on DOE approval of Critical Go/No Go or stage gate reviews decision points, as set forth in the Statement of Project Objectives.

As a result of the go/no go or stage gate reviews, DOE may, at its discretion, authorize the following actions by the Recipient: (1) continue to fund the project, depending on appropriations; (2) recommend redirection of work under the project; (3) place a hold on the project, pending further supporting data or funding; or (4) cancel the project because of insufficient progress, change in strategic direction, or lack of funding.

G. TYPE OF APPLICATION

DOE will accept only new applications under this announcement. Applications that are for renewals or extensions of existing DOE funded projects will not be considered.

PART III - ELIGIBILITY INFORMATION

A. ELIGIBLE APPLICANTS.

All types of domestic entities are eligible to apply, except other Federal agencies 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.

B. COST SHARING (Also see Appendix C to this FOA)

THERE ARE THREE (3) LEVELS OF COST SHARING REQUIREMENTS FOR THIS FOA.

1) TOPIC 1 and TOPIC 2 – Phase 1 – Recovery Act

The cost share must be at least 20% of the total allowable costs for research and development projects (i.e., the sum of the Government share, including FFRDC contractor costs if applicable, and the recipient share of allowable costs equals the total allowable cost of the project) and must come from non-Federal sources unless otherwise allowed by law. However, applications with proposed cost share as low as 10% (except for applications from Indian Tribes, which may propose cost share as low as 0%), shall be considered, using the Secretary's statutory authority to reduce cost-share requirements. Applicants proposing cost-share below 20% (applicant-share) shall provide a separate justification for their request and include it in the Project Narrative (see Section IV).

2) TOPIC 1 AND TOPIC 2 – Phases 2-5 – Non Recovery Act

For Phases 2-5, the cost share must be at least 20% of the total allowable costs for research and development projects (i.e. the sum of the Government share, including FFRDC contractor costs if applicable, and the recipient share of allowable costs equals the total allowable cost of the project) and must come from non-Federal sources unless otherwise allowed by law.

Total project cost includes the DOE share plus all non-Federal cost share. The cost share must come from non-Federal sources. (See 10 CFR Part 600 for applicable cost sharing requirements.) Cost share contributions may be divided among the Applicant and partners under any arrangement determined by the Applicant, but the total proposed cost share contribution from all members of the team (Applicant + partners) must equal or exceed the statutory requirement; with the exception of Phase 1, Recovery Act Funds. Funds from other DOE or Federally-funded entities cannot be used as cost share. Additionally, existing patents or other existing intellectual property may not be proposed as cost share (see Appendix C).

3) TOPIC 3 and TOPIC 4 – Recovery Act

The cost share must be at least 50% of the total allowable costs for demonstration activities (i.e., the sum of the Government share, including FFRDC contractor costs if applicable, and the recipient share of allowable costs equals the total allowable cost of the project) and must come from non-Federal sources unless otherwise allowed by law. However, applications with proposed cost share as low as 25% from private industry and as low as 10% from academic institutions, non-profits, Indian tribes, Tribal Energy Resource Development Groups, or state and local governments, shall be considered, using the Secretary's statutory authority to reduce cost-share

requirements. Applicants proposing cost-share below 50% (applicant-share) shall provide a separate justification for their request and include it in the Project Narrative (see Section IV).

Additionally, existing patents or other existing intellectual property may not be proposed as cost share (see Appendix C).

C. OTHER ELIGIBILITY REQUIREMENTS

- **Federally Funded Research and Development Center (FFRDC) Contractors**

FFRDC contractors are eligible for an award under this announcement or may be proposed as a team member on another entity's application.

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

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

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

Value/Funding. The value of, and funding for, the FFRDC contractor portion of the work will not normally be included in the award to a successful applicant. Usually, DOE will fund a DOE FFRDC contractor through the DOE field work proposal system and other FFRDC contractors through an interagency agreement with the sponsoring agency.

Cost Share. The applicant's cost share requirement will be based on the TOTAL cost of the project, including the applicant's and the FFRDC contractor's portions of the effort.

FFRDC Contractor Effort: The FFRDC contractor effort, in aggregate, shall not exceed 50% 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.

D. MULTIPLE PRINCIPAL INVESTIGATORS

The assignment and use of multiple Principal Investigators (PIs) in projects awarded under this FOA is allowed. The applicant, whether a single organization or team/partnership/consortium, must however indicate in the application if the project will

include multiple PI's. (See Part IV, Section C. 3.c.) The decision to use multiple PIs for a project is the sole responsibility of the applicant. If multiple PI's will be designated, the application must identify in the application the Contact PI/Project Coordinator and provide a "Coordination and Management Plan" that describes the organization structure of the project as it pertains to the designation of multiple PI's. This plan should, at a minimum, include:

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

PART IV – APPLICATION AND SUBMISSION INFORMATION

A. ADDRESS TO REQUEST APPLICATION PACKAGE REQUIRED

The Adobe Application Package is provided as a separate attachment to this Funding Opportunity Announcement. APPLICATIONS MUST BE SUBMITTED THROUGH FEDCONNECT AT <https://www.fedconnect.net/> TO BE CONSIDERED FOR AWARD. The Adobe Application Package identified in Section IV. C. is posted as an attachment to this FOA (in FedConnect). It is the responsibility of the applicant, prior to the Application due date and time, to verify successful transmission.

In the Adobe Application Package that is provided as a separate attachment to this announcement in FedConnect, first attach your application documents within the Adobe Application Package. Then save the Adobe Application Package, and submit it via the FedConnect portal. **IMPORTANT: DO NOT** use the "Save & Submit" button in the Adobe Application Package, since that button is only used when submitting an application in Grants.gov. See page 3 of this Announcement for additional information on submitting the Adobe Application Package.

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

B. LETTER OF INTENT AND PRE-APPLICATION

1. Letter of Intent

Letters of Intent are not required.

2. Pre-application

A pre-application is not required.

C. CONTENT AND FORM OF APPLICATION

The Adobe Application Package is provided as a separate attachment to this Funding Opportunity Announcement (on FedConnect). Once the forms below have been completed, save the Adobe Application Package in a single file, using up to 10 letters of the Applicant's Organization Name as the file name (e.g., ABC Corp). If your organization is submitting more than one Application to different topic areas, you must identify the Topic Area Number at the end of each file name (e.g., ABC Corp-Topic1). See page 3 of this Announcement for additional information on submitting the Adobe Application Package.

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

1. SF 424 - Application for Federal Assistance (this form is within the Adobe Application Package)

Complete this form first to populate data in other forms. Complete all required fields on the form. The list of certifications and assurances referenced in Field 21 can be found at http://management.energy.gov/business_doe/business_forms.htm, under Certifications and Assurances.

2. Project/Performance Site Location(s) (this form is within the Adobe Application Package)

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.

3. Other Attachments Form

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

a. Project Summary/Abstract File

The project summary/abstract must contain a summary of the proposed activity suitable for dissemination to the public. It should be a self-contained document that identifies the name of the applicant, the project director/principal investigator(s), the project title, the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (i.e., benefits, outcomes), and major participants (for collaborative projects). This document must not include any proprietary or sensitive business information, as the Department may make it available to the public. The project summary must not exceed 1 page when printed using standard 8.5" by 11" paper with 1" margins (top, bottom, left and right), single spaced, with font not smaller than 11 point. **Save this information in a file named “Summary.pdf,” and click on “Add Optional Other Attachment” in the Adobe Application Package to**

attach.

b. Project Narrative File - Mandatory Other Attachment

The project narrative must not exceed 30 (thirty) pages, including cover page, table of contents, charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right), single spaced. **EVALUATORS WILL REVIEW ONLY THE NUMBER OF PAGES SPECIFIED IN THE PRECEDING SENTENCE.** The font must not be smaller than 11 point. Do not include any Internet addresses (URLs) that provide information necessary to review the application. See Part VIII.D for instructions on how to mark proprietary application information. **Save the information in a single file named "Project.pdf," and click on "Add Mandatory Other Attachment" in the Adobe Application Package to attach.**

The project narrative must include:

- Topic Area to which you are applying
- Project Objectives.
This section should provide a clear, concise statement of the specific objectives/aims of the proposed project.
- Merit Review Criteria Discussion.
The section should be formatted to address each of the merit review criteria and sub-criteria listed in Part V. A. below. Provide sufficient information so that reviewers will be able to evaluate the application in accordance with these merit review criteria.
- DOE WILL EVALUATE AND CONSIDER ONLY THOSE APPLICATIONS THAT ADDRESS SEPARATELY EACH OF THE MERIT REVIEW CRITERIA AND SUB-CRITERIA. Therefore, it is recommended that the Project Narrative have sections labeled to match the four Evaluation Criteria as follows: Technical Merit, Significance and Impact, Project Management Plan and Statement of Project Objectives, and Roles, Responsibilities and Capabilities.
- Project Timetable:
This section should outline as a function of time, year by year, all the important activities or phases of the project, including any activities planned beyond the project period. Successful applicants must use this project timetable to report progress.
- American Recovery and Reinvestment Act (ARRA) Information:
This attachment to the Narrative should address how the project will promote and enhance the objectives of the American Recovery and Reinvestment Act of 2009, P.L. 111-5, especially job creation and/or preservation, and economic recovery in an expeditious manner. The response must include quantitative data (i.e. nature and type of position, duration of employment, and salary) supporting the number of jobs created and/or preserved, as well as data supporting any other direct economic recovery impacts attributable to the performance of the project.

- For Topic Area 1- Phase 1, Topic Area 3, and Topic Area 4, Applicants proposing cost-share below the requirement shall provide a separate justification for their request.

In the project narrative, clearly delineate project requirements between the Phase 1 and Phase 2 requirements, since activities funded with Recovery Act appropriations must be tracked separately from other requirements.

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

c. Resume File

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

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

Professional Experience: Beginning with the current position list, in chronological order, professional/academic positions with a brief description.

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

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

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

Of the key personnel identified in this file, indicate the Principal Investigator(s) (PI). If multiple PIs are proposed, the applicant must provide the information indicated in Part III, Section D. as part of this file.

The resume file does not have a page limitation.

d. Budget File

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

You must provide a separate budget for each year of support requested and cumulative budget for the total project period. Use the SF 424 A Excel, "Budget Information – Non Construction Programs" form on the Applicant and Recipient Page at http://management.energy.gov/business_doe/business_forms.htm. You may request funds under any of the Object Class Categories as long as the item and amount are necessary to perform the proposed work, meet all the criteria for allowability under the applicable Federal cost principles, and are not prohibited by the funding restrictions in this announcement (See PART IV, G). In the budget file and budget justification, clearly delineate the budget requirements between the Phase 1 and other Phase requirements, since Recovery Act appropriations must be tracked separately from other appropriations requirements. **Save the information in a single file named "SF424A.xls," and click on "Add Optional Other Attachment" in the Adobe Application Package to attach file.**

e. Budget Justification File (also see Appendix D)

You must justify the costs proposed in each Object Class Category/Cost Classification category (e.g., identify key persons and personnel categories and the estimated costs for each person or category; provide a list of equipment and cost of each item; identify proposed subaward/consultant work and cost of each subaward/consultant; describe purpose of proposed travel, number of travelers and number of travel days; list general categories of supplies and amount for each category; and provide any other information you wish to support your budget). Provide the name of your cognizant/oversight agency, if you have one, and the name and phone number of the individual responsible for negotiating your indirect rates as part of the budget justification. **Save the information in a single file named "budgetjustification.xls," and click on "Add Optional Other Attachment" in the Adobe Application Package to attach file.** Please refer to Appendix D – Budget Justification for guidelines and examples of the amount of information and support that is sufficient.

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

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

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

g. Letters of Commitment

You must have a letter from each third party contributing cost sharing (i.e., a party other than the organization submitting the application) that proposes to provide all or part of the required cost sharing. **All Letters of Commitment must be attached to the Project Narrative File.** The letter must state that the third party is committed to providing a specific minimum dollar amount of cost sharing. In the budget justification, identify the following information for each

third party contributing cost sharing: (1) the name of the organization; (2) the proposed dollar amount to be provided; (3) the amount as a percentage of the total project cost; and (4) the proposed cost sharing – cash, services, or property. Letters of Commitment from parties participating in the project, exclusive of vendors, who will not be contributing cost share, but will be integral to the success of the project must be included as part of this Appendix to the Narrative. Letters of Commitment will not count towards the Project Narrative page limit.

h. Subaward Budget File(s)

You must provide a separate budget (i.e., budget for each budget year and a cumulative budget) for each subawardee that is expected to perform work estimated to be more than \$100,000 or 50 percent of the total work effort (whichever is less). Use the SF 424 A Excel for Non Construction Programs or the SF 424 C Excel for Construction Programs. These forms are found on the Applicant and Recipient Page at <https://www.eere-pmc.energy.gov/forms.aspx>. **Save each Subaward budget in a separate file. Use up to 10 letters of the subawardee's name plus 424.xls as the file name (e.g., ABC Corp424.xls or energyres424.xls), and click on "Add Optional Other Attachment" in the Adobe Application Package to attach file.**

A separate budget justification for the subaward budget is also required. In the subaward budget file and subaward budget justification, clearly delineate the budget requirements between the Phase 1 and Phase 2 requirements, since Recovery Act appropriations must be tracked separately from other appropriation requirements. **Save each Subaward budget justification in a separate file. Use up to 10 letters of the subawardee's name plus just.xls as the file name (e.g., ABC Corpjust.xls), and click on "Add Optional Other Attachment" in the Adobe Application Package to attach file.** Please refer to Appendix D – Budget Justification for guidelines and examples of the amount of information and support that is sufficient.

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

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

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

If a FFRDC contractor is to perform a portion of the work, you must provide a DOE Field Work Proposal in accordance with the requirements in DOE Order 412.1 Work Authorization System. This order and the DOE Field Work Proposal form are available at the following link: <http://www.management.energy.gov/documents/o4121.pdf>. **Save each FFRDC Field Work Proposal in a separate file. Use up to 10 letters of the FFRDC**

name plus .pdf as the file name (e.g., lanl.pdf or anl.pdf), and click on “Add Optional Other Attachment” in the Adobe Application Package to attach.

j. Authorization for non-DOE or DOE FFRDCs

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

k. Project Management Plan

This plan should identify the activities/tasks to be performed, a time schedule for the accomplishment of the activities/tasks, the spending plan associated with the activities/tasks, and the expected dates for the release of outcomes. Applicants may use their own project management system to provide this information. This plan should identify any decision points and go/no-go decision criteria. Successful applicants must use this plan to report schedule and budget variances. In the project management plan, clearly delineate the project timeline and spending plan requirements between Phase 1 and other Phase requirements, since requirements funded by Recovery Act appropriations must be tracked separately from other appropriations requirements. **Save this plan in a single file named “pmp.pdf” and click on “Add Optional Other Attachments” in the Adobe Application Package to attach.**

l. SF-LLL Disclosure of Lobbying Activities

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

Summary of Required Forms/Files

Your application must include the following documents:

Name of Document	Format	File Name
SF 424 - Application for Federal Assistance	Part of Adobe Application Package	
Project/Performance Site Location(s)	Part of Adobe Application Package	
Other Attachments Form: Attach the following files to this form:	Part of Adobe Application Package	See Instructions

Name of Document	Format	File Name
Project Summary/Abstract File	PDF	Summary.pdf
Project Narrative File, including Letters of Commitment	PDF	Project.pdf
Resume File	PDF	Resume.pdf
SF 424A Excel – Budget Information for Non-Construction Programs File	Excel	SF424A.xls
Budget Justification File	PDF	See Instructions
Subaward Budget File(s), if applicable	Excel	See Instructions
Budget for Federally Funded Research and Development Center (FFRDC) Contractor File, if applicable.	PDF	See instructions
Authorization from cognizant Contracting Officer for FFRDC, if applicable.	PDF	FFRDC_Auth.pdf
Project Management Plan	PDF	PMP.pdf
SF-LLL Disclosure of Lobbying Activities, if applicable	Part of Adobe Application Package	

D. SUBMISSIONS FROM SUCCESSFUL APPLICANTS

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

- Indirect cost information
- Other budget information
- Environmental Questionnaire EF-1
- Because Recovery Act funds apply to awards under this announcement, additional certification requirements will be required for state or local governments. See Special Provisions located at: http://management.energy.gov/business_doe/business_forms.htm.

E. SUBMISSION DATES AND TIMES

Pre-application Due Date

Pre-applications are not required.

Application Due Date

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

RECEIVED AFTER THE DEADLINE WILL NOT BE REVIEWED OR CONSIDERED FOR AWARD.

F. INTERGOVERNMENTAL REVIEW

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

G. FUNDING RESTRICTIONS

Cost Principles. Costs must be allowable in accordance with the applicable Federal cost principles referenced in 10 CFR Part 600. The cost principles for commercial organizations 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 part 600. Recipients must obtain the prior approval of the contracting officer for any pre-award costs that are for periods greater than this 90 day calendar period.

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

H. SUBMISSION AND REGISTRATION REQUIREMENTS

1. Where to Submit

APPLICATIONS MUST BE SUBMITTED THROUGH FEDCONNECT TO BE CONSIDERED FOR AWARD (unless you have system-to-system capability with Grants.gov). Submit electronic applications through the FedConnect portal. Information regarding how to submit applications via Fed Connect can be found at https://www.fedconnect.net/FedConnect/PublicPages/FedConnect_Ready_Set_Go.pdf.

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

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

2. Registration Process Requirements

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

- A. Your organization's Dun and Bradstreet Data Universal Numbering System (DUNS) (including plus 4 extension if applicable). To check whether your organization has a DUNS or if your organization requires a DUNS, search for the number or request one at <http://fedgov.dnb.com/webform/displayHomePage.do>.
- B. A federal Central Contractor Registration (CCR) account. If your organization is not currently registered with CCR, please register at www.ccr.gov before continuing with your FedConnect registration.

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

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

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

3. Questions

Questions regarding the content of the announcement must be submitted through the FedConnect portal. You must register with FedConnect to submit questions and to receive responses to questions. It is recommended that you register as soon after release of the FOA as possible to have the benefit of all responses. More information is available at

https://www.fedconnect.net/FedConnect/PublicPages/FedConnect_Ready_Set_Go.pdf.

DOE will try to respond to a question within 3 business days, unless a similar question and answer have already been distributed.

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

Part V - APPLICATION REVIEW INFORMATION

A. REVIEW CRITERIA

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

- Initial Compliance Review
- Comprehensive Technical Evaluation
- Program policy factor review
- Review and selection by the Selection Official

1. Initial Review Criteria

Prior to a comprehensive merit evaluation, DOE will perform an initial compliance review to determine that (1) the applicant is eligible for an award; (2) the information required by the announcement has been submitted; (3) all mandatory requirements are satisfied; and (4) the proposed project is responsive to the objectives of the funding opportunity announcement and (5) the Project Narrative contains a minimum 2 page description of the how the project meets the Recovery Act objectives of job creation and economic recovery in an expeditious manner. The Project Narrative

describing the Recovery Act objectives, item (5) above, should be included as an attachment to the Project Narrative File identified in Part IV, section C., sub-section 3.b. If an application fails to meet these requirements, it may be deemed non-responsive and eliminated from full Merit Review.

2. Merit Review Criteria

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

Criterion 1: Technical Merit

Weight: [30%]

- Adequacy of the discussion on how the proposed work will address the stated need or problem. Adequacy of proposed deliverables.
- Completeness of the discussion on how the proposed work will support achieving the high-penetration PV objective.
- Degree of technical innovation as compared to the current state of the art.
- Viability of the proposed approach and likelihood of success based on current technology maturity and stakeholder acceptance of the technology.
- Technical merit and feasibility of the proposed work (i.e., is it based on sound scientific/engineering principles and on an understanding of current state of the art technology/methods).

Criterion 2: Significance and Impact

Weight: [30%]

- Benefits of the proposed development vs. current practices in terms of anticipated performance improvements (technical & operational).
- Degree to which the proposed development is broadly applicable and adaptable for other similar applications.
- Clarity and completeness of a plan to address potential risks and liabilities (e.g. technical, financial, and environmental) and the planned mitigation measures.
- Topics 1 and 2 Only: Adequacy of the plan to disseminate the modeling tool, the performance data, the resulting lessons learned and best practices for adaptation, or, the plan for how this information will be adopted on other circuits with similar characteristics.

Criterion 3: Project Management and Statement of Objectives Weight: [25%]

- Soundness and completeness of the Statement of Objectives, and likelihood of achieving project objectives through realistic milestones, schedule, and task structure.
- Adequacy, appropriateness, and reasonableness of the budget to complete the proposed project.
- Appropriateness of proposed go/no-go decision points.

Criterion 4: Roles, Responsibilities and Capabilities

Weight: [15%]

- Quality and relevance of the capabilities, experience, qualifications and credentials of key personnel to support the proposed project.
- Adequacy of the letters of commitment for each team member's participation and/or cost share.
- Adequacy of infrastructure and resources, including the capabilities of the Applicant and Participants, to comprehensively address all aspects of the proposed work.

2. Program Policy Factors

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

- Technological diversity of projects.
- Cost share offered above the minimum amount required.
- Depth and breadth of teaming arrangement to carry out the project objectives.
- For Phase 1, degree to which Applications promote and enhance the objectives of the American Recovery and Reinvestment Act of 2009, P.L. 111-5, especially job creation, and/or preservation and economic recovery in an expeditious manner.

B. REVIEW AND SELECTION PROCESS

1. Merit Review

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

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

2. Selection

The Selection Official may 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 part 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 in August 2009.

Part VI - AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES

1. Notice of Selection

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

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

2. Notice of Award

An Award issued by the contracting officer is the authorizing Award document. It normally includes, either as an attachment or by reference: 1. Special Terms and Conditions; 2. Applicable program regulations, if any; 3. Application as approved by DOE; 4. DOE assistance regulations at 10 CFR part 600; 5. National Policy Assurances To Be Incorporated As Award Terms; 6. Budget Summary; and 7. Federal Assistance Reporting Checklist, which identifies the reporting requirements.

B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

1. Administrative Requirements

The administrative requirements for DOE grants and cooperative agreements are contained in 10 CFR part 600 (See: <http://ecfr.gpoaccess.gov>).

2. Special Terms and Conditions and National Policy Requirements

The DOE Special Terms and Conditions for Use in Most Grants and Cooperative Agreements are located at

<http://www.management.energy.gov/documents/specialtermsandcondition308.pdf>.

The National Policy Assurances To Be Incorporated As Award Terms are located at http://management.energy.gov/business_doe/1374.htm.

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

3. Intellectual Property Provisions

The standard DOE financial assistance intellectual property provisions applicable to the various types of recipients are located at

http://www.gc.doe.gov/financial_assistance_awards.htm.

4. Statement of Substantial Involvement

The DOE Solar Energy Technologies Program will be substantially involved in agreements due to planned participation and directions in review of the models, testing, and definitive annual reviews with go/no-go decision points.

Specific involvement may include but are not limited to:

- Halting or redirecting an activity if detailed modeling progress does

not meet the planned schedule.

- Providing joint collaboration with recipient.

C. REPORTING

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

Awards under this FOA will be funded, in whole or in part, with funds appropriated by the American Recovery and Reinvestment Act of 2009, Pub. L. 111-5, (Recovery Act or Act). Be advised that Recovery Act reporting requirements may apply to projects funded by the Act. The reporting requirements will be specified in the DOE F 4600.2 or other related Recovery Act guidance as they become available.

PART VII - QUESTIONS

A. QUESTIONS

Questions regarding the content of the announcement must be submitted through the FedConnect portal. You must register with FedConnect 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. More information is available at https://www.fedconnect.net/FedConnect/PublicPages/FedConnect_Ready_Set_Go.pdf. DOE will try to respond to a question within 3 business days, unless a similar question and answer have already been distributed.

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

PART VIII - OTHER INFORMATION

A. MODIFICATIONS

Notices of any modifications to this announcement will be posted on 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.

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 _____ of this application have been submitted in confidence and contain trade secrets or proprietary information, and such data must 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 must 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 nonfederal 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.

Select and complete **only** if the program is covered under special protected data statutes (e.g. EPACKT 1992, SBIR, Energy Policy Act 2005}

Copyrights. For Topic Area 1, Recipients (including sub-recipients) must request permission from DOE before asserting copyrights to any works created under this Award. The request must be in writing, addressed to the Contracting Officer, and must describe the work for which copyright assertion is requested, a plan for distribution (e.g., open source, royalty-bearing licenses, etc.), and describe how that plan for distribution furthers the Statement of Project Objectives. The Contracting Officer will consult with the Contracting Officer's Representative and the DOE Patent Counsel prior to rendering a written decision regarding copyright assertion.

G. NOTICE OF RIGHT TO REQUEST PATENT WAIVER

DOE intends to issue a class waiver for Agreements awarded under this FOA, which DOE expects will cover most, if not all, prime Recipients and team members. If a class waiver is not issued or a prime Recipient or team member does not qualify for the class waiver, an Applicant, including team members other than the prime Recipient, 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 prime Recipients and team members 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. Additionally, DOE's patent waivers will include a U.S. competitiveness provision reflecting DOE's programmatic objectives; e.g., improving the competitive position as well as the U.S. employment opportunities in U.S. industries.

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

H. NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES

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

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

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

J. NOTICE OF POTENTIAL DISCLOSURE UNDER FREEDOM OF INFORMATION ACT

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

REFERENCE MATERIAL

Appendix A – Definitions

“Amendment” means a revision to a Funding Opportunity Announcement

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

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

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

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

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

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

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

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

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

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

“Credential Provider” is an organization that validates the electronic identity of an individual through electronic credentials, PINS, and passwords for Grants.gov. Funding Opportunity Announcements which require application submission through Grants.gov

require that the individual applying on behalf of an organization first be registered with the Credential Provider at <https://apply.grants.gov/OrcRegister>.

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

“E-Business Point of Contact (POC)” is the individual who is designated as the Electronic Business Point of Contact in the CCR registration. This person is the sole authority of the organization with the capability of designating or revoking an individual’s ability to submit grant applications on behalf of their organization through Grants.gov.

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

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

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

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

“Funding Opportunity Announcement (FOA)” is a publicly available document by which a Federal agency makes known its intentions to award discretionary grants or cooperative agreements, usually as a result of competition for funds. Funding opportunity announcements may be known as program announcements, notices of funding availability, solicitations, or other names depending on the agency and type of program.

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

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

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

“Marketing Partner Identification Number (MPIN)” is a very important password designated by your organization when registering in CCR. The E-Business Point of Contact

will need the MPIN to login to Grants.gov to assign privileges to the individual(s) authorized to submit applications on behalf of your organization. The MPIN must have 9 digits containing at least one alpha character (must be in capital letters) and one number (no spaces or special characters permitted).

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

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

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

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

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

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

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

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

"Technology Investment Agreement (TIA)" is a new type of assistance instrument for DOE, but they have been used by the Department of Defense for many years to support or stimulate research projects involving for-profit firms, especially commercial firms that do business primarily in the commercial marketplace. TIAs are different from grants and cooperative agreements in that the award terms may vary from the Government-wide standard terms (See DOE TIA regulations at 10 CFR Part 603). The primary purposes for including a TIA in the type of available award instruments are to encourage non-traditional Government contractors to participate in an R&D program and to facilitate new relationships and business practices. A TIA can be particularly useful for awards to consortia (See 10 CFR 603.225(b) and 603.515, Qualification of a consortium).

"Total Project Cost" means all the funds to complete the effort proposed by the Applicant, including DOE funds (including direct funding of any FFRDC) plus all other funds that will be committed by the Applicant as Cost Sharing.

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

“Utility” means an electric municipal or investor-owned utility, or a rural electric cooperative.

Appendix B – Personally Identifiable Information

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

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

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

1. **Public PII:** PII found in public sources such as telephone books, public websites, business cards, university listing, etc. Public PII includes first and last name, address, work telephone number, email address, home telephone number, and general education credentials.
2. **Protected PII:** PII that requires enhanced protection. This information includes data that if compromised could cause harm to an individual such as identity theft.

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

- Social Security Numbers in any form
- Place of Birth associated with an individual
- Date of Birth associated with an individual
- Mother's maiden name associated with an individual
- Biometric record associated with an individual
- Fingerprint
- Iris scan
- DNA
- Medical history information associated with an individual
- Medical conditions, including history of disease
- Metric information, e.g. weight, height, blood pressure
- Criminal history associated with an individual
- Employment history and other employment information associated with an individual
- Ratings
- Disciplinary actions
- Performance elements and standards (or work expectations) are PII when they are so intertwined with performance appraisals that their disclosure would reveal an individual's performance appraisal
- Financial information associated with an individual
- Credit card numbers
- Bank account numbers
- Security clearance history or related information (not including actual clearances held)

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

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

Appendix C – Cost Share Information

Cost Sharing or Cost Matching

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

How Cost Sharing Is Calculated

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

Formula: Federal share (\$) divided by Federal share (%) = Total Project Cost

Example: \$1,000,000 divided by 80% = \$1,250,000

Formula: Total Project Cost (\$) minus Federal share (\$) = Non-federal share (\$)

Example: \$1,250,000 minus \$1,000,000 = \$250,000

Formula: Non-federal share (\$) divided by Total Project Cost (\$) = Non-federal share (%)

Example: \$250,000 divided by \$1,250,000 = 20%

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

What Qualifies For Cost Sharing

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

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

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

In addition to the regulations referenced above, other factors may also come into play such as timing of donations and length of the project period. For example, the value of ten years

of donated maintenance on a project that has a project period of five years would not be fully allowable as cost share. Only the value for the five years of donated maintenance that corresponds to the project period is allowable and may be counted as cost share.

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

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

DOE Financial Assistance Regulations:

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

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

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

- (1) They are verifiable from the recipient's records.
- (2) They are not included as contributions for any other federally-assisted project or program.
- (3) They are necessary and reasonable for proper and efficient accomplishment of project or program objectives.
- (4) They are allowable under the cost principles applicable to the type of entity incurring the cost as follows:
 - (a) *For-profit organizations.* Allowability of costs incurred by for-profit organizations and those nonprofit organizations listed in Attachment C to OMB Circular A-122 is determined in accordance with the for-profit costs principles in 48 CFR Part 31 in the Federal Acquisition Regulation, except that patent prosecution costs are not allowable unless specifically authorized in the award document.
 - (b) *Other types of organizations.* Allowability of costs incurred by other types of organizations that may be subrecipients under a prime award is determined as follows:
 - (i) *Institutions of higher education.* Allowability is determined in accordance with OMB Circular No. A-21 -- Cost Principles for Educational Institutions.
 - (ii) *Other nonprofit organizations.* Allowability is determined in accordance with OMB Circular A-122, Cost Principles for Non-Profit Organizations.

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

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

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

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

(B) *Valuing and documenting contributions*

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

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

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

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

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

- (a) Donated supplies may include such items as office supplies or laboratory supplies. Value assessed to donated supplies included in the cost sharing or matching share must be reasonable and must not exceed the fair market value of the property at the time of the donation.
 - (b) Normally only depreciation or use charges for equipment and buildings may be applied. However, the fair rental charges for land and the full value of equipment or other capital assets may be allowed, when they will be consumed in the performance of the award or fully depreciated by the end of the award, provided that the contracting officer has approved the charges. When use charges are applied, values must be determined in accordance with the usual accounting policies of the recipient, with the following qualifications:
 - (i) The value of donated space must not exceed the fair rental value of comparable space as established by an independent appraisal of comparable space and facilities in a privately-owned building in the same locality.
 - (ii) The value of loaned equipment must not exceed its fair rental value.
- (5) *Documentation.* The following requirements pertain to the recipient's supporting records for in-kind contributions from third parties:
- (a) Volunteer services must be documented and, to the extent feasible, supported by the same methods used by the recipient for its own employees.
 - (b) The basis for determining the valuation for personal services and property must be documented.

Appendix D – Budget Justification

Using the “Object Class Categories” in the SF-424A Budget form, justify the costs in each category **for each budget period of the project.**

The SF424A Budget form and the Budget Justification must include both Federal (DOE), and Non-Federal (cost share) funds, thereby reflecting TOTAL PROJECT COSTS proposed.

For each sub-recipient with total project costs of \$100,000 or more, a separate SF-424A budget and budget justification form must be submitted. For sub-recipients with estimated costs less than \$100,000, provide what Statement of Project Objectives task(s) are being performed, the purpose/need for the effort, and a basis of the estimated costs that is considered sufficient for DOE evaluation.

All costs incurred by the Applicant’s sub-recipients, vendors, contractors, consultants and Federal Research and Development Centers (FFRDCs), should be entered only in section f. Contractual. All other sections are for the costs of the Applicant only.

Personnel

List costs solely for employees of the Applicant. Identify positions to be supported. Key personnel should be identified by title. All other personnel should be identified either by title or a group category. State the amounts of time (e.g., hours or % of time) to be expended, the composite base pay rate, total direct personnel compensation and identify the rate basis (e.g., actual salary, labor distribution report, technical estimate, state civil service rates, etc.). Identify the number of employees (on a Full Time Equivalent) that will be employed in each position or group category. Note the prevailing wage requirements in the ARRA (P.L. 111-5). See example below.

Task # and Title	Position Title	Budget Period 1			Budget Period 2			Budget Period 3			Project Total Hours	Project Total Dollars	Rate Basis
		Time (Hours)	Pay Rate (\$/Hr)	Total Budget Period 1	Time (Hours)	Pay Rate (\$/Hr)	Total Budget Period 2	Time (Hours)	Pay Rate (\$/Hr)	Total Budget Period 3			
Task 1 – Task Name	Sr. Engineer (1)	2000	\$85.00	\$170,000	200	\$50.00	\$10,000	200	\$50.00	\$10,000	2400	\$190,000	Actual Salary
Task 2 – Task Name	Process engineers (3)	6200	\$35.00	\$217,000	400	\$35.00	\$14,000	600	\$35.00	\$21,000	7200	\$252,000	Actual Salary
Task 3 – Task Name	Technician (1)	1800	\$20.00	\$36,000	0	\$0.00	\$0	0	\$0.00	\$0	1800	\$36,000	Actual Salary

Fringe

A federally approved fringe benefit rate agreement, or a proposed rate supported and agreed upon by DOE for estimating purposes is required if reimbursement for fringe benefits is requested. If a fringe benefit rate has been negotiated with, or approved by, a federal government agency, a copy of the latest rate agreement must be included with this application. If there is not a current, federally approved rate agreement negotiated and available, provide a copy of the proposal with the application. If selected, the rate agreement will be finalized during award negotiations. Calculate the fringe rate and enter

the total amount in Section B, line 6.b. ("Fringe Benefits") of form SF-424A.

IMPORTANT: Provide all fringe rates, along with a complete explanation and the full calculations used to derive the total fringe costs. If the total fringe costs are a cumulative amount of more than one calculation or rate application, the explanation and calculations should identify all rates used, along with the base they were applied to (and how the base was derived), and a total for each (along with grand total). The rates and how they are applied should not be averaged to get one fringe rate. **NOTE:** The fringe rate should be applied to both the Federal Share and Recipient Cost Share.

Travel

See example of travel detail below. Identify total Foreign and Domestic Travel as separate items. Purpose of travel are items such as professional conferences, DOE sponsored meetings, project management meetings, etc. Identify number of travelers, estimated cost per traveler, and duration of trip. The Basis for Estimating Costs could be items such as past trips, current quotations, Federal Travel Regulations, etc. All listed travel must be necessary for performance of the Statement of Project Objectives. **NOTE:** All projects should include travel for 1-2 travelers to a DOE project review during each year of the project. Each review will take approximately 2-3 days.

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

Equipment

Equipment is generally defined as an item with an acquisition cost greater than \$5,000 and a useful life expectancy of more than one year. All proposed equipment should be identified, providing a basis of cost such as vendor quotes, catalog prices, prior invoices, etc., and briefly justifying its need as it applies to the Statement of Project Objectives. If it is existing equipment, and the value of its contribution to the project budget is being shown as cost share, provide logical support for the estimated value shown. If it is new equipment which will retain a useful life upon completion of the project, provide logical support for the estimated value shown. For equipment over \$50,000 in price, also include a copy of the associated vendor quote or catalog price list. See example below.

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

Budget Period 1 Total			\$40,000		
(repeat as necessary for each Budget Period)					

Supplies

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

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

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

Contractual

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

Sub-recipients (partners, sub-awardees):

For each sub-recipient with total project costs of \$100,000 or more, a separate SF-424A budget and budget justification form must be submitted. For sub-recipients with estimated costs less than \$100,000, provide what Statement of Project Objectives task(s) are being performed, the purpose/need for the effort, and a basis of the estimated costs that is considered sufficient for DOE evaluation.

Vendors (includes contractors and consultants):

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

Federal Research and Development Centers (FFRDCs):

For FFRDC partners, the applicant should provide a Field Work Proposal (if not already provided with the original application), along with the FFRDC labor mix and hours, by category and FFRDC major purchases greater than \$25,000, including Quantity, Unit Cost, Basis of Cost, and Justification.

Sub-Recipient Name/Organization	Purpose/Tasks in SOPO	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Project Total
EXAMPLE ONLY!!! XYZ Corp.	Partner to develop optimal fresnel lens for Gen 2 product - Task 2.4	\$48,000	\$32,000	\$16,000	\$96,000
	Sub-total	\$48,000	\$32,000	\$16,000	\$96,000

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

Construction

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

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

Overall description of construction activities:			
Example Only!!! - Build wind turbine platform			
General Description	Cost	Basis of Cost	Justification of need
Budget Period 1			
Three days of excavation for platform site EXAMPLE ONLY!!!	\$28,000	Engineering estimate	Site must be prepared for construction of platform.
Budget Period 1 Total	\$28,000		
(repeat as necessary for each Budget Period)			

Other Direct Costs

Other direct costs are direct cost items required for the project which do not fit clearly into other categories, and are not included in the indirect pool for which the indirect rate is being applied to this project. Basis of cost are items such as vendor quotes, prior purchases of similar or like items, published price list, etc.

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

Indirect Costs

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

IMPORTANT: Provide a complete explanation and the full calculations used to derive the total indirect costs. If the total indirect costs are a cumulative amount of more than one calculation or rate application, the explanation and calculations should identify all rates used, along with the base they were applied to (and how the base was derived), and a total for each (along with grand total). The rates and how they are applied should not be averaged to get one indirect cost percentage. **NOTE:** The indirect rate should be applied to both the Federal Share and Recipient Cost Share.

Cost Share

A detailed presentation of the cash or cash value of all cost share proposed for the project must be provided. Identify the source and amount of each item of cost share proposed by the Applicant and each sub-recipient. Letters of commitment must be submitted for all third party cost share (other than award recipient).

Note that "cost-share" is not limited to cash investment. Other items that may be assigned value in a budget as incurred as part of the project budget and necessary to performance of the project, may be considered as cost share, such as: contribution of services or property; donated, purchased or existing equipment; buildings or land; donated, purchased or existing supplies; and/or unrecovered personnel, fringe benefits and indirect costs, etc. For each cost share contribution identified as other than cash, identify the item and describe how the value of the cost share contribution was calculated.

Funds from other Federal sources MAY NOT be counted as cost share. This prohibition includes FFRDC sub-recipients. Non-Federal sources include private, state or local Government, or any source not originally derived from Federal funds.

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

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

American Recovery and Reinvestment Act Information:

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

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