

**FINANCIAL ASSISTANCE  
FUNDING OPPORTUNITY ANNOUNCEMENT**



**U. S. Department of Energy  
Office of Science  
Office of Basic Energy Sciences**

**Energy Frontier Research Centers**

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## **REGISTRATIONS**

### **A. Required Registrations**

There are several one-time actions you must complete in order to submit an application in response to this Announcement. Applicants not currently registered with SAM and Grants.gov should allow **at least 44 days** to complete these requirements. You should start the process as soon as possible.

In addition to registering in Grant.gov and the DOE Office of Science Portfolio Analysis and Management System (PAMS) as described in B and C below, the following actions are required:

- Applicants must obtain a DUNS number at <http://fedgov.dnb.com/webform>.
- Applicants must register with the System for Award Management (SAM) at <http://www.sam.gov/>. If you had an active registration in the Central Contractor Registry (CCR), you should have an active registration in SAM. More information about SAM registration for applicants is found at [https://www.sam.gov/sam/transcript/Quick\\_Guide\\_for\\_Grants\\_Registrations\\_v1.7.pdf](https://www.sam.gov/sam/transcript/Quick_Guide_for_Grants_Registrations_v1.7.pdf).
- Applicants must register with FedConnect at [www.fedconnect.net](http://www.fedconnect.net). The full, binding version of assistance agreements will be posted to FedConnect. Applicants must be registered with FedConnect to submit questions.
- Recipients must register with the Federal Funding Accountability and Transparency Act Subaward Reporting System at <https://www.frs.gov>. This registration must be completed before an award may be made: you are advised to register while preparing your application.

### **B. Registering in Grants.gov**

Applicants must register with Grants.gov.

For organizations, please follow the procedures detailed below, making use of the checklist provided below:

<http://www.grants.gov/web/grants/applicants/organization-registration.html>

<http://www.grants.gov/documents/19/18243/OrganizationRegChecklist.pdf>

For individuals, please follow the procedures detailed below:

<http://www.grants.gov/web/grants/applicants/individual-registration.html>

Organizations and individuals must have an E-Business (E-Biz) Point of Contact (POC). You may find the checklist at [http://www.grants.gov/documents/19/18243/E-Biz\\_POC\\_Checklist.pdf](http://www.grants.gov/documents/19/18243/E-Biz_POC_Checklist.pdf) useful.

Grants.gov maintains a User Guide at <http://www.grants.gov/documents/19/18243/GrantsGovApplicantUserGuide.pdf> and a list of Frequently Asked Questions at <http://www.grants.gov/web/grants/applicants/applicant-faqs.html>. Questions relating to the registration process, **system requirements, or how an application form works** must be directed to Grants.gov at 1-800-518-4726 or [support@grants.gov](mailto:support@grants.gov).

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

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

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

### **C. DOE Office of Science Portfolio Analysis and Management System (PAMS)**

After you submit your application through Grants.gov, the application will automatically transfer into the Portfolio Analysis and Management System (PAMS), the DOE Office of Science's online financial awards management system. The DOE Office of Science will process the application in PAMS, which is available at <https://pamspublic.science.energy.gov>.

You will want to “register to” your application: a process of linking yourself to the application after it has been submitted through grants.gov and processed by DOE.

You must register in PAMS to submit the mandatory Letter of Intent (LOI).

You may use the Internet Explorer, Firefox, Google Chrome, or Safari browsers to access PAMS.

Notifications sent from the PAMS system will come from the PAMS email address <[PAMS.Autoreply@science.doe.gov](mailto:PAMS.Autoreply@science.doe.gov)>. Please make sure your email server/software allows delivery of emails from the PAMS email address to yours.

Registering to PAMS is a two-step process; once you create an individual account, you must associate yourself with (“register to”) your institution. Detailed steps are listed below.

#### **1. CREATE PAMS ACCOUNT:**

To register, click the “Create New PAMS Account” link on the website <https://pamspublic.science.energy.gov/>.

- Click the “No, I have never had an account” link and then the “Create Account” button.
- You will be prompted to enter your name and email address, create a username and password, and select a security question and answer. Once you have done this, click the “Save and Continue” button.
- On the next page, enter the required information (at least one phone number and your mailing address) and any optional information you wish to provide (e.g., FAX number, website, mailstop code, additional email addresses or phone numbers, Division/Department). Click the “Create Account” button.
- Read the user agreement and click the “Accept” button to indicate that you understand your responsibilities and agree to comply with the rules of behavior for PAMS.
- PAMS will take you to the “Having Trouble Logging In?” page. (If you have been an Office of Science merit reviewer or if you have previously submitted an application, you may already be linked to an institution in PAMS. If this happens, you will be taken to the PAMS home page.)

## 2. REGISTER TO YOUR INSTITUTION:

- Click the link labeled “Option 2: I know my institution and I am here to register to the institution.” (Note: If you previously created a PAMS account but did not register to an institution at that time, you must click the Institutions tab and click the “Register to Institution” link.)
- PAMS will take you to the “Register to Institution” page.
- Type a word or phrase from your institution name in the field labeled, “Institution Name like,” choose the radio button next to the item that best describes your role in the system, and click the “Search” button. A “like” search in PAMS returns results that contain the word or phrase you enter; you do not need to enter the exact name of the institution, but you should enter a word or phrase contained within the institution name. (If your institution has a frequently used acronym, such as ANL for Argonne National Laboratory or UCLA for the Regents of the University of California, Los Angeles, you may find it easiest to search for the acronym under “Institution Name like.” Many institutions with acronyms are listed in PAMS with their acronyms in parentheses after their names.)
- Find your institution in the list that is returned by the search and click the “Actions” link in the Options column next to the institution name to obtain a dropdown list. Select “Add me to this institution” from the dropdown. PAMS will take you to the “Institutions – List” page.
- If you do not see your institution in the initial search results, you can search again by clicking the “Cancel” button, clicking the Option 2 link, and repeating the search.
- If, after searching, you think your institution is not currently in the database, click the “Cannot Find My Institution” button and enter the requested institution information into PAMS. Click the “Create Institution” button. PAMS will add the institution to the system, associate your profile with the new institution, and return you to the “Institutions – List” page when you are finished.

For help with PAMS, click the “External User Guide” link on the PAMS website, <https://pamspublic.science.energy.gov/>. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9AM – 5:30 PM Eastern Time (Telephone: (855) 818-1846

(toll free) or (301) 903-9610, Email: [sc.pams-helpdesk@science.doe.gov](mailto:sc.pams-helpdesk@science.doe.gov)). The PAMS Help Desk is closed on Federal holidays. All submissions to and inquiries about this Funding Opportunity Announcement should reference **DE-FOA-0001010**.

#### RECOMMENDATION

The Office of Science encourages you to register in all systems as soon as possible. You are also encouraged to submit letters of intent and applications well before the deadlines.



## **Section I – FUNDING OPPORTUNITY DESCRIPTION**

### **GENERAL INQUIRIES ABOUT THIS FOA:**

Questions regarding the content of the FOA must be submitted through the FedConnect portal. You must register with FedConnect to respond as an interested party to submit questions, and to view responses to questions. It is recommended that you register as soon after release of the FOA as possible to have the benefit of all responses. More information is available on the FedConnect website ([www.fedconnect.net](http://www.fedconnect.net)).

Questions pertaining to the FedConnect registration process or the submission of questions through FedConnect should be directed by e-mail to [support@FedConnect.net](mailto:support@FedConnect.net) or by phone to the FedConnect Support Center at 1-800-899-6665.

### **STATUTORY AUTHORITY**

Public Law 95-91, Department of Energy Organization Act  
Public Law 109-58, Energy Policy Act of 2005

### **APPLICABLE REGULATIONS**

U.S. Department of Energy Financial Assistance Rules, codified at 10 CFR 600  
U.S. Department of Energy, Office of Science Financial Assistance Program Rule, codified at 10 CFR 605

### **SUMMARY**

The 21<sup>st</sup> century brings with it significant challenges for advanced energy technologies, but as history has proven, major breakthroughs in clean energy technologies will likely be built on a deep foundation of basic research advances. Solar photovoltaic technology has its roots in Einstein's early twentieth-century paper on the photoelectric effect. The electronics used to improve the efficiency of today's internal combustion engine have their root in the transistor, whose development was enabled by the discovery of quantum mechanics. Key to exploiting such discoveries is the ability to create new materials using sophisticated synthesis and processing techniques, precisely define the atomic arrangements in matter, and control physical and chemical transformations. The energy systems of the future will revolve around materials and chemical changes that convert energy from one form to another. To control chemical reactions or to generate electricity from solar photons requires coordination of multiple steps, each carried out by customized materials with designed nanoscale structures. Such advanced materials must be designed and fabricated to exacting standards using principles revealed by basic science.

In 2009, the Office of Basic Energy Sciences (BES) in the U.S. Department of Energy's Office of Science established the Energy Frontier Research Center (EFRC) program. These integrated, multi-investigator centers involve various combinations of researchers at universities, national laboratories, nonprofit organizations, and for-profit firms. The EFRCs have conducted

fundamental research focused on one or more “grand challenges” and use-inspired “basic research needs” identified in major strategic planning efforts by BES and the scientific community. These centers bring together the skills and talents of teams of investigators to perform energy-relevant basic research with a scope and complexity beyond that possible in standard single-investigator or small-group projects. The multi-investigator, multi-disciplinary nature of these centers fosters an environment in which innovations are encouraged and scientific breakthroughs accelerated to provide the basis for transformative energy technologies. The EFRCs pursue the fundamental understanding necessary to enhance U.S. energy security and to meet the global need for abundant, clean, and economical energy.

The Office of Basic Energy Sciences announces the re-competition of the Energy Frontier Research Centers and encourages both new and renewal applications. Applications will be required to address **both** use-inspired priority research directions identified by the series of “Basic Research Needs” reports **and** scientific grand challenges identified in the report *Directing Matter and Energy: Five Challenges for Science and the Imagination*, both of which are described below. In addition, as appropriate, applicants are encouraged to consider the incorporation of research approaches outlined in the following two reports: 1) *Computational Materials Science and Chemistry: Accelerating Discovery and Innovation through Simulation-Based Engineering and Science*; and 2) *From Quanta to the Continuum: Opportunities for Mesoscale Science*. All of these reports can be found here: <http://science.energy.gov/bes/news-and-resources/reports/>. Funding will be competitively awarded to the successful Energy Frontier Research Center applications selected by Federal officials, based on a rigorous merit review process as detailed in Section V of this Funding Opportunity Announcement (FOA).

## SUPPLEMENTARY INFORMATION

### *Establishing Priority Directions for Basic Energy Research*

The mission of the Basic Energy Sciences (BES) program is to support fundamental research to understand, predict, and ultimately control matter and energy at the electronic, atomic, and molecular levels in order to provide the foundations for new energy technologies and to support DOE’s mission emphases in energy, the environment, and national security. BES has long invested in innovative basic research to advance the DOE mission through BES’s core research areas. The research disciplines that BES supports—condensed matter and materials physics, chemistry, geosciences, and targeted aspects of biosciences—are those that discover new materials and design new chemical processes that touch virtually every important aspect of energy resources, production, conversion, transmission, storage, efficiency, and waste mitigation.

In 2001, the Basic Energy Sciences Advisory Committee (BESAC) conducted a far-reaching study to assess the scope of fundamental scientific research that must be considered to address the DOE mission. The scientific community responded to this BESAC study with enthusiasm through participation in a weeklong workshop, the results of which were published in early 2003 in the report, *Basic Research Needs to Assure a Secure Energy Future*. That report inspired the following series of “**Basic Research Needs**” workshops (listed in alphabetical order below), which together attracted more than 1,700 participants from universities, industry, and federal laboratories, plus two capstone workshops, one of which defined a “new era” of 21<sup>st</sup> century

science and a second that examined ways to strengthen connections between basic research and technology:

- *Basic Research Needs for Advanced Nuclear Energy Systems*
- *Basic Research Needs for Carbon Capture: Beyond 2020*
- *Basic Research Needs: Catalysis for Energy*
- *Basic Research Needs for Clean and Efficient Combustion of 21st Century Transportation Fuels*
- *Basic Research Needs for Electrical Energy Storage*
- *Basic Research Needs for Geosciences: Facilitating 21st Century Energy Systems*
- *Basic Research Needs for the Hydrogen Economy*
- *Basic Research Needs for Materials under Extreme Environments*
- *Basic Research Needs for Solar Energy Utilization*
- *Basic Research Needs for Solid-State Lighting*
- *Basic Research Needs for Superconductivity*
- *New Science for a Secure and Sustainable Energy Future*
- *Science for Energy Technology: Strengthening the Link between Basic Research and Industry*

Together, these workshop reports highlight the remarkable scientific evolution that has taken place during the past few decades. The resulting scientific challenges describe a new era of science in which materials functionalities are designed to specifications and chemical transformations are manipulated at will. Out of these reports, the following set of recurring, crosscutting themes emerged that relate to control of the properties and functionalities of matter:

- *Design, discovery, and synthesis of new materials and molecular assemblies through atomic scale control;*
- *Control of photon, electron, spin, phonon, and ion transport in materials;*
- *Tailored design of catalysts, interfaces, and membranes;*
- *Bio-materials and bio-interfaces, particularly those at the nanoscale; and*
- *New tools for spatial characterization, temporal characterization, and for theory, modeling, and computation.*

### ***The Science “Grand Challenges”***

This goal to direct and control matter at the electronic, atomic, and molecular levels, requires new insights into the complexity that governs material properties and processes at the quantum level. Following the initial Basic Research Needs workshops, three additional workshops examined the primary roadblocks to progress, and research approaches to overcoming them:

1. ***Directing Matter and Energy: Five Challenges for Science and the Imagination.*** In this report, a new era for energy science was posed in five “grand challenges”:
  - *How do we control material processes at the level of electrons?*

- *How do we design and perfect atom- and energy-efficient synthesis of revolutionary new forms of matter with tailored properties?*
- *How do remarkable properties of matter emerge from complex correlations of the atomic or electronic constituents and how can we control these properties?*
- *How can we master energy and information on the nanoscale to create new technologies with capabilities rivaling those of living things?*
- *How do we characterize and control matter away – especially very far away – from equilibrium?*

2. ***Computational Materials Science and Chemistry: Accelerating Discovery and Innovation through Simulation-Based Engineering and Science.*** This report focused on the use of predictive theory, modeling and simulation in materials science and chemistry to accelerate the development of new materials and processes for energy applications. The report and its scientific challenges directly underpin the Materials Genome Initiative (<http://www.whitehouse.gov/mgi>). The report laid out five scientific challenges that will accelerate discovery and innovation:

- *Integration of synthesis, processing, characterization, theory and simulation and modeling;*
- *Achieving/strengthening predictive capability in foundational challenge areas;*
- *Developing validated computational approaches that span vast differences in time and length scales;*
- *Experimental validation and quantification of uncertainty in simulation and modeling; and*
- *Robust and sustainable computational infrastructure, including software and applications.*

3. ***From Quanta to the Continuum: Opportunities for Mesoscale Science.*** This report examined the scientific opportunities encompassed in the mesoscale, where classical, quantum, and nanoscale science meet, and where the functionality that is critical to macroscopic behavior begins to manifest itself. The report identified six mesoscale challenges:

- *Mastering defect mesostructure and its evolution;*
- *Regulating coupled reactions and pathway-dependent chemical processes;*
- *Optimizing transport and response properties by design and control of mesoscale structure;*
- *Elucidating non-equilibrium and many-body physics of electrons*
- *Harnessing fluctuations, dynamics and degradation for control of metastable mesoscale systems; and*
- *Directing assembly of hierarchical functional materials.*

Taken together, these reports form a broad and comprehensive view of the fundamental research, tools, and approaches that are needed to address scientific barriers to create new and improved energy technologies, develop future energy sources, improve energy efficiency, and reduce

environmental impacts of energy production and use.

The full reports from all of the workshops described above are on the following web page:

<http://science.energy.gov/bes/news-and-resources/reports/>

### ***Purpose and Objectives***

To implement the collective scientific recommendations of the reports described above and to stimulate frontier energy research in a new era of science, the Office of Basic Energy Sciences is seeking new and renewal applications for Energy Frontier Research Centers (EFRCs). EFRCs bring together the skills and talents of multiple investigators to enable fundamental research of a scope and complexity that would not be possible with a standard individual investigator or small-group research project. As such, the EFRCs strengthen and complement the portfolio of single investigator and small group research projects supported within BES core research areas, as well as larger scale R&D activities supported by the DOE Energy Innovation Hubs such as the Joint Center for Artificial Photosynthesis and the Joint Center for Energy Storage Research.

*Note: The purpose of the EFRC program does not include construction (including new buildings or additions to existing building), and costs for such activities will not be funded by awards resulting from this FOA.*

### ***Management, Impact and Output***

BES expects the EFRCs to accelerate scientific breakthroughs in energy-relevant areas by addressing problems with scope, complexity and risk that are beyond the capabilities of single investigator or small-group projects. BES's stewardship of the EFRC projects is an important feature of the program. A variety of methods are used to regularly assess the ongoing progress of the EFRCs, including annual progress reports, monthly phone calls between BES program managers and the EFRC Directors, periodic Directors' meetings, on-site visits by program managers, and in-person reviews by outside experts. BES also organizes periodic Principal Investigators' Meetings to facilitate collaboration and information exchange among the EFRCs.

The EFRCs should bring together world-class scientists from different disciplines to tackle challenging problems in new ways; to provide an environment that encourages high-risk, high-reward research that would not be done otherwise; to integrate synthesis, characterization, theory, and computation to accelerate the rate of scientific progress; to develop new, innovative experimental and theoretical tools that illuminate fundamental processes in unprecedented detail; and to create an enthusiastic, inter-disciplinary community of energy-focused scientists. Successful EFRCs will fully exploit this "team science" model, working closely together in an integrated, centrally managed center to address a clearly defined set of scientific challenges with a clear focus and well-defined 5-year scientific research goals.

The focus of the EFRCs is on combined fundamental, grand challenge and use-inspired science, and therefore dissemination of results through peer-reviewed publications is a necessary measure of success. In addition, it is anticipated that some EFRC basic research will also impact energy technology research and industry. When appropriate, EFRCs are encouraged to file for patent

protection. Recipients are also encouraged to explore opportunities to interface with DOE's technology and small business programs or other partners to accelerate the transition of promising scientific results to technology development and commercial applications, though such efforts will not be funded by the EFRC awards.

### ***Definitions***

**Basic Research:** Basic Research is defined as scientific study directed toward fuller knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications towards processes or products in mind. Basic research, however, may include activities with broad applications in mind.

**DOE/NNSA National Laboratories:** DOE/NNSA National Laboratories are those laboratories defined as a National Laboratory by Section 2 (3) of the Energy Policy Act of 2005 (EPAAct 05), which are listed below:

- (A) Ames Laboratory
- (B) Argonne National Laboratory
- (C) Brookhaven National Laboratory
- (D) Fermi National Accelerator Laboratory
- (E) Idaho National Laboratory
- (F) Lawrence Berkeley National Laboratory
- (G) Lawrence Livermore National Laboratory
- (H) Los Alamos National Laboratory
- (I) National Energy Technology Laboratory
- (J) National Renewable Energy Laboratory
- (K) Oak Ridge National Laboratory
- (L) Pacific Northwest National Laboratory
- (M) Princeton Plasma Physics Laboratory
- (N) Sandia National Laboratories
- (O) Savannah River National Laboratory
- (P) Stanford Linear Accelerator Center
- (Q) Thomas Jefferson National Accelerator Facility

**EFRC Director:** The EFRC Director is the lead Principal Investigator and must be employed or have an agreement in place to be hired by the lead organization (prime applicant/prime recipient) in the event an award is made. Each EFRC application must identify a single Director; no co-directorship is allowed. The EFRC Director will serve as the primary contact responsible for communications with the DOE Program Manager on behalf of all of the Principal Investigators in the EFRC. The EFRC Director and the DOE Program Manager may establish an agreement for informal technical discussion or information exchange among Principal Investigators and DOE staff. The EFRC Director should commit a substantial amount of his/her time to the EFRC.

**Lead Organization:** The lead organization is the prime applicant with whom DOE will enter into a prime award relationship. Any teaming arrangement must have only one designated lead

organization that will submit a Letter of Intent (LOI) and an application on behalf of the team members.

**Merit Review:** A thorough, consistent, and objective examination of applications based on pre-established criteria by persons who are independent of those submitting the application and who are knowledgeable in the field of endeavor for which support is requested.

**Merit Review Panel (MRP):** A group of reviewers who are selected by Federal Officials based upon their expertise and professional qualifications in one or more of the scientific and technical fields involved in the applications.

**New Application:** A new application is: 1) An application for funding to create a new EFRC that has not previously received DOE funding; 2) An application for continued research from the same lead organization as a current EFRC but with a significant change in scientific research thrust; or 3) An application to continue research performed under an existing EFRC but with a new lead organization. Successful new applications will be funded for an initial period up to five years.

**Principal Investigator:** A Principal Investigator (PI) is an individual designated by the applicant organization to have the appropriate level of authority and responsibility to direct research to be supported by the award. The applicant organization may designate multiple individuals as PIs who share the authority and responsibility for leading and directing the project, intellectually and logistically. When multiple PIs are named, each is responsible and accountable to the applicant organization, or as appropriate, to a collaborating organization for the proper conduct of the project or program including the submission of all required reports. The presence of more than one PI on an application or award diminishes neither the responsibility nor the accountability of any individual PI.

**Renewal Application:** A renewal application is an application requesting additional funding for an existing EFRC for a period subsequent to that provided by a current award. Renewal applications compete for funds with all other peer-reviewed applications and must be developed as fully as though the applicant is applying for the first time. **Renewal EFRC applications must be submitted by the same lead organization as the current EFRC for which renewal funding is requested, and the proposed research topics must be logical scientific extensions of the research that has been performed in the current EFRC.** Successful renewal applications will be funded for an additional period up to five years, which will be treated as an extension of the current project period.

**Selection Official:** The DOE official authorized to select applications for funding after considering the merit review findings, Federal Officials' recommendations, program policy and management factors, and the amount of funds available.

**Senior/Key Personnel:** A senior/key person is any individual who contributes to the scientific development or execution of a project in a substantive, measurable way, whether or not they receive salaries or compensation under the grant. This definition includes, but is not limited to, the EFRC Director and the Principal Investigators. Senior/key personnel typically have doctoral or other professional degrees. Consultants may also be considered senior/key personnel if they meet this definition. For the EFRCs, effort “as needed” is not an acceptable level of involvement for Senior/Key Personnel.



## **Section II – AWARD INFORMATION**

### **A. TYPE OF AWARD INSTRUMENT**

DOE may award a field work authorization, an interagency agreement, or a grant under this Funding Opportunity Announcement. A DOE field work authorization or other appropriate instrument will be awarded to a successful DOE/NNSA National Laboratory contractor. Participation by non-DOE/NNSA Federal agencies and their Federally Funded Research and Development Center (FFRDC) contractors will be funded under an interagency agreement (but see Section III. A. ELIGIBLE APPLICANTS). A grant will be awarded to any other successful domestic entity including, but not limited to, universities, nonprofit organizations, and for-profit organizations.

DOE will consider funding multi-institution collaborations under this FOA (see “Team Arrangements” in Section III. D. OTHER ELIGIBILITY REQUIREMENTS).

### **B. ESTIMATED FUNDING**

DOE expects to make multiple Energy Frontier Research Center (EFRC) awards for a period of up to five years. Total funding up to \$100,000,000 annually is expected to be available to support the awards from this FOA, subject to appropriation of funds by the Congress. DOE is under no obligation to pay for any costs associated with preparation or submission of applications. DOE reserves the right to fund, in whole or in part, any, all, or none of the applications submitted in response to this FOA.

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

### **C. MAXIMUM AND MINIMUM AWARD SIZE**

(See B. Estimated Funding section above.)

DOE anticipates that award sizes will range from \$2,000,000 per year to \$4,000,000 per year. The award size will depend on the merit review, the number of meritorious applications, and the availability of appropriated funds.

#### **Ceiling**

\$4,000,000 per year (\$20,000,000 for a 5-year period)

#### **Floor**

\$2,000,000 per year (\$10,000,000 for a 5-year period)

#### **D. EXPECTED NUMBER OF AWARDS**

(See B. Estimated Funding Section above.)

The exact number of awards will depend on the number of meritorious applications and the availability of appropriated funds. DOE reserves the right to fund, in whole or in part, any, all, or none of the applications submitted in response to this FOA.

#### **E. PERIOD OF PERFORMANCE**

(See B. Estimated Funding section above.)

Awards are expected to be made for a period of up to five years.

Continuation funding (funding for the 2nd and subsequent budget periods) is contingent on: (1) availability of funds appropriated by Congress and future year budget authority; (2) substantial progress towards meeting the objectives of the approved application; (3) submittal of required reports; and (4) compliance with the terms and conditions of the award. Additionally, funding for the final two years is contingent upon satisfactory completion of an extensive progress review during the third year of each project, which may include an external peer review. BES will use the mid-term review to assess the productivity and impact of each EFRC and progress toward meeting the stated five-year scientific research goals.

#### **F. TYPE OF APPLICATION**

DOE will accept new and renewal applications under this FOA. Please see *Definitions* in the preceding Supplementary Information section for assistance in determining if a renewal application is appropriate.

#### **G. VALUE/FUNDING FOR DOE/NNSA NATIONAL LABORATORY CONTRACTORS AND NON-DOE/NNSA FFRDC CONTRACTORS**

For grant awards, the value of, and funding for, a DOE/NNSA National Laboratory contractor, a non-DOE/NNSA FFRDC contractor, or another Federal agency's portion of the work will not be included in the award to the successful applicant. DOE will fund a DOE/NNSA National Laboratory contractor through the DOE field work authorization system or other appropriate process and will fund non-DOE/NNSA FFRDC contractors and other Federal agencies through an interagency agreement in accordance with the Economy Act, 31 U.S.C. 1535, or other statutory authority.

#### **H. RESPONSIBILITY**

The successful prime applicant/awardee (lead organization) 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 any team member, and/or subawardee.

If an award is made to a DOE/NNSA National Laboratory, all Disputes and Claims will be resolved in accordance with the terms and conditions of the DOE/NNSA National Laboratory's M&O contract, as applicable, in consultation between DOE and the prime awardee.

If an award is made to another Federal agency or its FFRDC contractor, all Disputes and Claims will be resolved in accordance with the terms and conditions of the interagency agreement in consultation between DOE and the prime awardee.

## **Section III – ELIGIBILITY INFORMATION**

### **A. ELIGIBLE APPLICANTS**

#### **1. INDIVIDUALS**

U.S. citizens and lawful permanent residents are eligible to apply for funding as a prime recipient (lead organization) or subawardee (team member).

#### **2. DOMESTIC ENTITIES**

For-profit entities, educational institutions, and nonprofits<sup>1</sup> that are incorporated (or otherwise formed) under the laws of a particular State or territory of the United States are eligible to apply for funding as a prime recipient (lead organization) or subawardee (team member).

State, local, and tribal government entities are eligible to apply for funding as a prime recipient (lead organization) or subawardee (team member).

DOE/NNSA National Laboratories are eligible to apply for funding as a prime recipient (lead organization) or subawardee (team member).

Non-DOE/NNSA FFRDCs and non-DOE GOGOs are eligible to apply for funding as a subawardee (team member), but are not eligible to apply as a prime recipient (lead organization).

Federal agencies and instrumentalities (other than DOE) are eligible to apply for funding as a subawardee (team member), but are not eligible to apply as a prime recipient (lead organization).

#### **3. FOREIGN ENTITIES**

Foreign entities, whether for-profit or otherwise, are eligible to apply for funding under this FOA.

Other than as provided in the “Individuals” or “Domestic Entities” sections above, all prime recipients (lead organizations) receiving funding under this FOA must be incorporated (or otherwise formed) under the laws of a State or territory of the United States. If a foreign entity applies for funding as a prime recipient, it must designate in the Letter of Intent (LOI) and full application a subsidiary or affiliate incorporated (or otherwise formed) under the laws of a State or territory of the United States to be the prime recipient. The LOI and full application must state the nature of the corporate relationship between the foreign entity and domestic subsidiary or affiliate. Foreign entities may request a waiver of this requirement in the full application. See Section IV.C.7. for waiver request information. DOE has discretion to waive this requirement if

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<sup>1</sup>Nonprofit organizations described in section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995, are not eligible to apply for funding.

it determines that it will further the purposes of this FOA and is otherwise in the interests of DOE.

A foreign entity, with or without a subsidiary or affiliate incorporated (or otherwise formed) under the laws of a state or territory of the United States, may receive funding as a subawardee (team member).

#### **4. INCORPORATED CONSORTIA**

Incorporated consortia, which may include domestic and/or foreign entities, are eligible to apply for funding as a prime recipient (lead organization) or subawardee (team member). For consortia incorporated (or otherwise formed) under the laws of a State or territory of the United States, please refer to “Domestic Entities” above. For consortia incorporated in foreign countries, please refer to the requirements in “Foreign Entities” above.

Each incorporated consortium must have an internal governance structure and a written set of internal rules. Upon request, the consortium must provide a written description of its internal governance structure and its internal rules to the DOE Contracting Officer.

#### **5. UNINCORPORATED CONSORTIA**

Unincorporated consortia (team arrangements), which may include domestic and foreign entities, must designate one member of the consortium to serve as the prime recipient/consortium representative (lead organization). The prime recipient/consortium representative must be incorporated (or otherwise formed) under the laws of a State or territory of the United States.

Upon request, unincorporated consortia must provide the DOE Contracting Officer with a collaboration agreement, commonly referred to as the articles of collaboration, which sets out the rights and responsibilities of each consortium member. This agreement binds the individual consortium members together and should discuss, among other things, the consortium's:

- Management structure;
- Method of making payments to consortium members;
- Means of ensuring and overseeing members' efforts on the project;
- Provisions for members' cost sharing contributions; and
- Provisions for ownership and rights in intellectual property developed previously or under the agreement.

## **B. COST SHARING**

Cost sharing is not required.

## C. ELIGIBLE INDIVIDUALS

Individuals with the skills, knowledge, and resources necessary to carry out the proposed research as a Principal Investigator are invited to develop an application. Individuals from underrepresented groups as well as individuals with disabilities are encouraged to apply.

## D. OTHER ELIGIBILITY REQUIREMENTS

### *Letter of Intent (LOI)*

**To be considered eligible for an award under this FOA, potential prime applicants (lead organizations) are *required* to submit a LOI in accordance with the instructions provided in Section IV.B.1 below. Applications received from an applicant who has not submitted the required LOI will be deemed non-responsive and will be rejected without further review.**

The lead organization on an application must be the same as on the required LOI. **If an application is received for which the lead organization has changed since submission of the LOI, then the application will be deemed non-responsive and will be rejected without further review.** The lead PI (EFRC Director) should not be changed unless unavoidable and only minor edits should be made, if necessary, to the title. If necessary, the applicant may make changes to other senior/key personnel and other participating institutions, although DOE discourages extensive changes.

### *Limitation on Number of Applications Submitted by a Lead Organization*

A specific entity may not submit more than a *total* of three new and/or renewal applications as the lead organization. **If more than three applications are received from an institution, DOE will consider only the three applications that match qualified LOIs (as described below in Section IV.B.1). The remaining applications will be deemed non-responsive and rejected without further review.** However, there is no limitation on the number of applications in which a specific entity may participate as a team member or subcontractor.

### *Limitation on Number of Applications Submitted by an EFRC Director*

The EFRC Director is the lead Principal Investigator and must be employed or have an agreement in place to be hired by the lead organization. An individual may not be named as the EFRC Director on more than one application. **If the proposed EFRC Director will not be employed by the lead organization, the application will be deemed non-responsive and will be rejected without further review. Further, if more than one application is received from an applicant identifying the same individual as the EFRC Director, DOE will consider only the application (if any) that matches a qualified LOI (as described in Section IV.B.1). The remaining applications will be deemed non-responsive and rejected without further review.** However, there is no restriction on the number of applications in which an individual may participate as a Principal Investigator.

### ***Limitation on Amount of DOE Funds Requested***

The maximum total amount of funds DOE will provide for individual awards, including teaming arrangements, is \$4,000,000 annually or \$20,000,000 for the five-year project period.

### ***Team Arrangements***

Entities proposing as a team must designate a lead organization. LOIs and applications must be submitted on behalf of the team members by the lead organization and DOE will enter into a prime award relationship with the designated lead organization. Only one LOI and one application is to be submitted for each team. The designated lead organization, i.e., the prime applicant, must perform a greater percentage of the effort than any other partner organization or subawardee. The percentage of effort will be determined by reviewing the total budget for each participating organization as a percentage of proposed total project costs. **If an application is received in which the prime applicant is not performing a greater percentage of the effort than each of the other institutional partners, team members, or subawardees, as determined by the budget, the application will be deemed non-responsive and rejected without further review.**

### ***Eligible/Ineligible Entities***

**If an application is received that includes an ineligible entity, or an employee of an ineligible entity performing activities as a team member and/or subawardee, the application will be deemed non-responsive and rejected without further review.** Note, however, that otherwise ineligible entities are not precluded from serving as vendors of materials, supplies, equipment, and providing scientific and technical advisory services to a proposed EFRC, if they are acting purely in that role. Scientific and technical advisory services allow for the provision of scientific and technical expertise without actually performing research activities; examples of such services include serving as members of advisory committees and technical peer review panels or participation in scientific workshops or conferences.

### ***DOE/NNSA National Laboratory Contractors***

DOE/NNSA National Laboratory applicants are eligible to apply for funding as the lead organization or team member under this announcement if their cognizant DOE/NNSA Contracting Officer provides written authorization and this authorization is submitted with the application as part of the Budget for DOE/NNSA National Laboratory Contractor File. (This is not required for the National Energy Technology Laboratory since it is a Government Owned/Government Operated (GOGO.)) If a DOE/NNSA National Laboratory is selected for award, or proposed as a team member, the proposed work will be authorized under the DOE field work authorization system or other appropriate process and performed under the laboratory's Management and Operating (M&O) contract, as applicable. The following wording is acceptable for the authorization:

“Authorization is granted for the \_\_\_\_\_ Laboratory to participate in the proposed project. The work proposed for the laboratory is consistent with or complementary to the missions of the laboratory and will not adversely impact execution of the DOE/NNSA assigned programs at the laboratory.”

### ***Non-DOE/NNSA Federal Agencies and their FFRDC Contractors***

Non-DOE/NNSA Federal agencies and their FFRDC contractors are not eligible for a prime award under this announcement, but they may be proposed as a team member on another entity's application subject to the following guidelines:

The prime applicant must obtain written authorization for non-DOE/NNSA FFRDC participation. The cognizant Contracting Officer for the Federal agency sponsoring the FFRDC contractor must authorize in writing the participation of the FFRDC contractor on the proposed project and this authorization must be submitted with the application. The written authorization must also contain a determination that the use of a FFRDC contractor is consistent with the contractor's authority under its award and does not place the FFRDC contractor in direct competition with the private sector, in accordance with FAR Part 17.5. The following wording is acceptable for the authorization:

“Authorization is granted for the \_\_\_\_\_ Laboratory to participate in the proposed project. The work proposed for the laboratory is consistent with or complementary to the missions of the laboratory and will not adversely impact execution of the (insert agency) assigned programs at the laboratory. This laboratory is authorized to perform the work proposed in the application submitted under DOE Funding Opportunity Announcement # DE-FOA-0001010 by the following statutory authority (insert statute name, citation, and section) .”

### ***Performance of Work in the United States***

DOE requires all work performed by the prime recipient under funding agreements resulting from this FOA to be performed in the United States – i.e., a prime recipient must expend 100% of its total project costs in the United States. Work funded as a subaward from the prime recipient may be performed outside of the United States.

Applicants may request a waiver of this requirement. To do so, applicants must include a written waiver request in the full application. DOE has discretion to waive this requirement if it determines that it will further the purposes of this FOA and is otherwise in the interests of DOE. See Section IV.C.7 of the FOA for waiver request information.



## Section IV – APPLICATION AND SUBMISSION INFORMATION

### A. ADDRESS TO REQUEST APPLICATION PACKAGE

Application forms and instructions are available at Grants.gov. To access these materials, go to <http://www.grants.gov>, select “Apply for Grants”, and then select “Download Application Package.” Enter the CFDA number (81.049) and/or the funding opportunity number (DE-FOA-0001010) shown on the cover of this FOA and then follow the prompts to download the application package.

Applications submitted through [www.FedConnect.net](http://www.FedConnect.net) will not be accepted.

### B. LETTER OF INTENT AND PRE-APPLICATION

#### 1. Letter of Intent (LOI)

LETTER OF INTENT DUE DATE

November 13, 2013 at 5:00 PM Eastern Time

A Letter of Intent (LOI) is **required** for both new and renewal applications and must be submitted by 5:00 PM Eastern Time on November 13, 2013. **Any full application received for which there is not an associated LOI will be deemed non-responsive and will be rejected without further review.** In addition, the lead organization on the full applications must be the same as on the LOI. **If an application is received for which the lead organization has changed since submission of the LOI, then the application will be deemed non-responsive and will be rejected without further review.** The lead PI (EFRC Director) should not be changed unless unavoidable and only minor edits should be made, if necessary, to the title. If necessary, the applicant may make changes to other senior/key personnel and other participating institutions, although DOE discourages extensive changes.

The LOI is to help in planning the review and the selection of potential reviewers for the application. For this purpose, the LOI must include a cover page with the following information:

Letter of Intent Title (this is the EFRC Name)

Lead Principal Investigator Name, Job Title (this is the EFRC Director)

Lead Organization

Lead Principal Investigator Phone Number and Email Address

Funding Opportunity Announcement Number: DE-FOA-0001010

New or Renewal application:

Grand Challenge(s) addressed by EFRC (as identified in Section I of this FOA):

Basic Research Needs area(s) addressed by EFRC (as identified in Section I of this FOA):

Key Words, to assist BES with sorting (up to three from list below):

**Key Words (alphabetical):** biofuels (non-fermentative approaches); bio-inspired energy science; carbon capture; carbon storage and sequestration; catalysis; combustion; energy storage; extreme environments; hydrogen and fuel cells; materials and chemistry by design; mesoscale

science; nanoscale science; nuclear (including radiation effects); solar fuels; solar photovoltaic; solar thermal; solid state lighting; superconductivity; thermoelectrics

**This cover page must be signed by an official of the lead organization who has the authority to commit institutional support for the application and by the proposed EFRC Director.** For DOE National Laboratory applicants, the institutional official should be the Laboratory Director. For other applicants, this official should be someone who has authority over research activities for the entire institution, such as the Vice President for Research, Chief Technology Officer, or the equivalent. **All applicants must provide both of these signatures on the LOI.** Applicants that fail to provide both signatures on the LOI must provide a corrected LOI with both signatures on or before December 13, 2013 in order for their full application associated with the LOI to be considered for award.

The cover page must be followed by a clear and concise description of the goals, objectives and technical approaches of the proposed research. The description of the proposed research may not exceed two pages when printed on 8.5 X 11 inch paper, with a minimum text font size no smaller than Times New Roman 12 point and margins no smaller than one inch on all sides. The required header information and any figures and references, if included, must fit within the two-page limit.

In addition, the LOI must include the following two Tables, which will not count toward the two-page limit for the LOI:

**Table 1: Senior/key personnel on the application and institutional affiliations**

<b>Senior/Key Personnel</b>			<b>Institution</b>
Last Name	First Name	Title	Institution Name

**Table 2: Collaborators for senior/key personnel on the application**

<b>Collaborator</b>			<b>Institution</b>
Last Name	First Name	Title	Institution Name

\*\* Table 2 must include co-authors over the past 48 months, graduate and postdoctoral advisors/advisees, and close associations. Table 2 should *exclude* all personnel at any of the institutions listed in Table 1.

- Table 1 and Table 2 will not count in the LOI page limitation.

### ***Limitation on Number of Letters of Intent Submitted by Each Lead Organization***

A specific entity may not submit more than a ***total*** of three new and renewal LOIs as the lead organization. **If more than three qualified LOIs are received from a lead organization, DOE will consider the first three qualified LOIs received based on the PAMS date and time stamp. The remaining LOIs will be deemed non-responsive and the applicant will not be allowed to submit full applications tied to those LOIs.** However, there is no limitation on the number of LOIs in which a specific institution may participate as a team member or subcontractor.

### ***Limitation on Number of Letters of Intent Submitted by an EFRC Director***

The EFRC Director is the lead Principal Investigator and must be employed or have an agreement in place to be hired by the lead organization in the event an award is made. An individual may not be named as the EFRC Director on more than one LOI. **If more than one qualified LOI is received from an applicant identifying the same individual as the EFRC Director, DOE will consider the first qualified LOI received based on the PAMS date and time stamp. The remaining LOIs will be deemed non-responsive and the applicant will not be allowed to submit full applications tied to those LOIs.** However, there is no restriction on the number of LOIs in which an individual may participate as a Principal Investigator.

**All LOIs received by DOE will be acknowledged by an automated email to the lead PI (EFRC Director). Any individual named as the Lead PI (EFRC Director) on a LOI that is found to be non-responsive to the LOI requirements will be notified by December 10, 2013, and will be ineligible to submit a full application associated with that LOI. LOIs that are deemed responsive will receive no additional notification.**

### **The LOI must be submitted electronically through the DOE Office of Science Portfolio Analysis and Management System (PAMS) website: <https://pamspublic.science.energy.gov/>.**

It is important that the LOI be a single file with extension .pdf, .docx, or .doc. The Lead Principal Investigator (PI), which is the EFRC Director, and anyone submitting on behalf of the Lead PI must register for an account in PAMS before it will be possible to submit an LOI. **All PIs and those submitting LOIs on behalf of PIs are encouraged to establish PAMS accounts as soon as possible to avoid submission delays.**

You may use the Internet Explorer, Firefox, Google Chrome, or Safari browsers to access PAMS.

Registering to PAMS is a two-step process; once you create an individual account, you must associate yourself with (“register to”) your institution. Detailed steps are listed below.

**See Pages ii - iv of “REGISTRATIONS” Section at the beginning of this FOA for instructions on how to create a PAMS Account.**

### **Submit Your Letter of Intent:**

- Create your LOI outside the system and save it as a file with extension .docx, .doc, or .pdf. Make a note of the location of the file on your computer so you can browse for it later from within PAMS.
- Log into PAMS (address provided on page ii) and click the Proposals tab. Click the “View / Respond to Funding Opportunity Announcements” link and find the current announcement in the list. Click the “Actions/Views” link in the Options column next to this announcement to obtain a dropdown menu. Select “Submit Letter of Intent” from the dropdown.
- On the “Submit Letter of Intent” page, select the institution from which you are submitting this LOI from the Institution dropdown. If you are associated with only one institution in the system, there will only be one institution in the dropdown.
- Note that you must select one and only one Principal Investigator (PI) (the EFRC Director) per LOI; to do so, click the “Select PI” button on the far right side of the screen. Find the appropriate PI from the list of all registered users from your institution returned by PAMS. (Hint: You may have to sort, filter, or search through the list if it has multiple pages.) Click the “Actions” link in the Options column next to the appropriate PI to obtain a dropdown menu. From the dropdown, choose “Select PI.”
- If the PI for whom you are submitting does not appear on the list, it means he or she has not yet registered in PAMS. For your convenience, you may have PAMS send an email invitation to the PI to register in PAMS. To do so, click the “Invite PI” link at the top left of the “Select PI” screen. You can enter an optional personal message to the PI in the “Comments” box, and it will be included in the email sent by PAMS to the PI. You must wait until the PI registers before you can submit the LOI. Save the LOI for later work by clicking the “Save” button at the bottom of the screen. It will be stored in “My Letters of Intent” for later editing.
- Enter a title for your LOI.
- Select the technical contact from the Program Manager dropdown (there will be only one).
- To upload the LOI file into PAMS, click the “Attach File” button at the far right side of the screen. Click the “Browse” (or “Choose File” depending on your browser) button to search for your file. You may enter an optional description of the file you are attaching. Click the “Upload” button to upload the file.
- At the bottom of the screen, click the “Submit to DOE” button to save and submit the LOI to DOE.
- Upon submission, the PI will receive an email from the PAMS system <[PAMS.Autoreply@science.doe.gov](mailto:PAMS.Autoreply@science.doe.gov)> acknowledging receipt of the LOI.
- Keep a record of your PAMS LOI tracking number, as you will need this when submitting your application.

You are encouraged to register for an account in PAMS at least a week in advance of the LOI submission deadline to avoid delays with your submission.

## **2. Pre-application**

A pre-application is not required or invited.

## C. APPLICATION CONTENT AND FORMS

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

**Personally Identifiable Information:** Do not include sensitive personally identifiable information such as a Social Security Number, date of birth, or city of birth anywhere within the application package, including within any of the appendices. Do not include information that a merit reviewer should not make use of.

**Letters of Recommendation:** Letters of recommendation are discouraged and will not be reviewed by the Department.

### 1. SF-424 (R&R)

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

### 2. Research and Related Other Project Information

#### a. Complete questions 1 through 6.

##### Note concerning question 4.a.

DOE understands the phrase in field 4.a., “potential impact on the environment,” to apply if the work described in the application could potentially have any of the impacts listed in (1) through (5) of [10 CFR PART 1021, Appendix B, Conditions that Are Integral Elements of the Classes of Action](#). (click on the preceding link to go directly to Appendix B or navigate from the website:

<http://www.gpo.gov/fdsys/browse/collectionCfr.action?collectionCode=CFR>)

Additionally, for actions which could have any other high consequence impacts to the environment or have any possibility for high consequence impacts to human health (e.g., use of human subjects, Biosafety Level 3-4 laboratory construction/operation, manufacture or use of certain nanoscale materials which are known to impact human health, or any activities involving transuranic or high level radioactive waste or materials or exposure to any radioactive materials beyond de minimis levels), applicants should indicate “potential impact on the environment.”

Lastly, if there would be 1) extraordinary circumstances (i.e., scientific or public

controversy) related to the significance of environmental effects (10 CFR 1021.410 (b)(2)), 2) if the work is connected to other actions with potentially significant impacts (10 CFR 1021.410 (b)(3), or 3) if the work is related to other nearby actions with the potential for cumulatively significant impacts (10 CFR 1021.410 (b)(3)), applicants should indicate “potential impact on the environment.”

**b. Attach Files:**

**The file attachments must comply with the following instructions:**

**PROJECT SUMMARY/ABSTRACT (FIELD 7 ON THE FORM)**

The project summary/abstract is a summary of the proposed activity suitable for distribution to the public and sufficient to permit potential reviewers to identify conflicts of interest. It must be a self-contained document that includes the EFRC title, the EFRC Director name and institutional affiliation, other Principal Investigators and senior/key personnel and their institutional affiliations, the objectives of the project, a description of the project, including methods to be employed, and the potential impact of the project (i.e., benefits, outcomes). The project summary must not exceed 1 page when printed using standard 8.5” by 11” paper with 1” margins (top, bottom, left and right) with font not smaller than Times New Roman 12 point. To attach a Project Summary/Abstract, click “Add Attachment.”

- Do not include any proprietary or sensitive business information.
- DOE may use the abstract to prepare public reports about supported research.

**DOE COVER PAGE (PART OF PROJECT NARRATIVE ATTACHED TO FIELD 8 ON THE FORM)**

The project narrative should begin with a cover page that will not count toward the project narrative page limitation. The cover page must include the following items:

- The Project Title (EFRC Name) [This should closely match the LOI]
- Lead Applicant/Institution: [This must match the LOI]
- Street Address/City/State/Zip:
- Postal Address:
- Lead PI (EFRC Director) name, telephone number, email: [This should match the LOI, unless a change was unavoidable]
- Administrative Point of Contact name, telephone number, email:
- FOA Number: DE-FOA-0001010
- DOE/Office of Science Program Office: Basic Energy Sciences
- DOE Award Number (if renewal application; leave blank for new applications):
- PAMS LOI tracking number:
- Grand Challenge(s) addressed by EFRC, as identified in Section I of this FOA :
- Basic Research Needs area(s) addressed by EFRC, as identified in Section I of this FOA:

The lead organization must be the same as on the required LOI. **If an application is received for which the lead organization has changed since submission of the LOI, then the application**

**will be deemed non-responsive and will be rejected without further review.** The lead PI should not be changed unless unavoidable and only minor edits should be made, if necessary, to the title. If necessary, the applicant may make changes to the other senior/key personnel and other participating institutions, although DOE discourages extensive changes.

On separate pages, as a supplement to the cover page, include the following personnel and summary budget information for all senior/key personnel and all partner institutions:

**Table 1: Senior/key personnel on the application and institutional affiliations**

Senior/Key Personnel			Institution
Last Name	First Name	Title	Institution Name

**Table 2: Summary budget information for all partner institutions**

Institution Name	Year 1 Budget	Year 2 Budget	Year 3 Budget	Year 4 Budget	Year 5 Budget	Total Budget
<b>Total Budget</b>						

\*\* Provide the total costs (\$ in thousands) of the budget request in each year for each institution and totals for all rows and columns.

**PROJECT NARRATIVE (FIELD 8 ON THE FORM)**

The Project Narrative **must not exceed 40 pages** of technical information, including 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). The font must not be smaller than Times New Roman 12 point. **Only the first 40 pages of the Project Narrative will be reviewed or considered.** This page limit does not apply to the Cover Page, Budget Page(s), Budget Justification, biographical material, publications and references, and appendices, each of which may have its own page limit. Headers/footers containing page numbers and project titles/logos may be inserted within the required 1” margins. Do not include any Internet addresses (URLs) that provide supplementary or additional information that constitutes a part of the application. Merit reviewers are not required to access Internet sites; however, Internet publications in a list of references will be treated identically to print publications. See Part VIII.D for instructions on how to mark proprietary application information. To attach a Project Narrative, click “Add Attachment.”

The contents of the Project Narrative are specified in order to ensure that the merit reviewers have the necessary information to conduct proper evaluations. All Project Narratives must

include the following sections:

**I. Introduction, Background, and Progress** This section should place the proposed EFRC in the context of the scientific field in which it would operate by including the following:

- Briefly sketch the background leading to the application, critically evaluate existing knowledge, and specifically identify the scientific gaps that the project is intended to fill;
- Clearly state the five-year scientific research goals of the proposed EFRC;
- Provide an account of any preliminary studies that may be pertinent to the proposed research;
- Include any information that will help to establish the experience and competence of the investigators to pursue the proposed project;
- State concisely the importance of the research described in the application and its potential scientific impact;
- For renewal applications, include a summary of the research progress made by the EFRC since it was initiated in August 2009. For new applications, applicants may provide a comparable description of research performed by the senior/key personnel that is relevant to the proposed research.

**II. Proposed Research** Applicants must provide detailed information regarding the research proposed for the EFRC. This section should demonstrate the close integration of the proposed research activities aimed at meeting the 5-year scientific goals. This section, which may be organized in subtasks, must clearly describe the proposed research by including the following:

- Describe a balanced and comprehensive program of basic research that, as needed, supports experimental, theoretical, and computational efforts and the development of new capabilities and approaches in these areas; include a clear statement of the open science questions to be addressed, a detailed research plan, an assessment of the potential scientific impact of the research, and a description of how the research plan will attain the 5-year scientific goals;
- Explain how success of the proposed research topics *requires* an EFRC approach involving multiple, closely connected senior/key personnel and a structure that encourages high-risk, high-reward research and fosters synergy among investigators; Describe how such an approach will be implemented;
- Describe how the research proposed for the EFRC is at the scientific forefront of one or more of the “grand challenges” described in the BESAC report *Directing Matter and Energy: Five Challenges for Science and the Imagination* (<http://science.energy.gov/bes/news-and-resources/reports/abstracts/#GC>);
- Describe how the research proposed for the EFRC addresses one or more of the energy challenges described in the *Basic Research Needs* report series (<http://science.energy.gov/bes/news-and-resources/reports/>);
- If applicable, describe how the proposed research embodies the scientific approaches detailed in the following reports: *Computational Materials Science and Chemistry: Accelerating Discovery and Innovation through Simulation-Based Engineering and Science* (<http://science.energy.gov/bes/news-and-resources/reports/abstracts/#CMSC>)



and *From Quanta to the Continuum: Opportunities for Mesoscale Science* (<http://science.energy.gov/bes/news-and-resources/reports/abstracts/#OFMS>);

- Discuss how the proposed research is aligned with the core research activities and priorities within the BES Materials Sciences and Engineering Division and the BES Chemical Sciences, Geosciences and Biosciences Division (<http://science.energy.gov/bes/mse/>, <http://science.energy.gov/bes/csgeb/>);
- Describe the role and intellectual contribution of the EFRC Director, each Principal Investigator, and each other senior/key person in the application;
- Briefly outline the resources available to the proposed EFRC including access to existing research space, instrumentation, computational capabilities, and other facilities both within the EFRC partner institutions and external to the EFRC;
- Describe plans for development and utilization of unique facilities, capabilities or approaches to address the scientific goals;
- If applicable, describe how the proposed research relates to and is clearly distinguishable from activities within the DOE Energy Innovations Hubs, particularly the Joint Center for Artificial Photosynthesis and the Joint Center for Energy Storage Research. (<http://science.energy.gov/bes/research/doe-energy-innovation-hubs/>);
- Describe how the proposed research relates to other existing and planned research programs at the participating institutions.

**III. EFRC Management Plan** This section must provide a clear, substantive overview of the vision, management, and organization of the proposed EFRC by including the following:

- Describe the strategy and plan for developing and operating the EFRC, the means of achieving an integrated research team, and plans for leadership and guidance for the scientific and technical direction of the EFRC;
- Define an organizational structure that delineates the roles and responsibilities of senior/key personnel and describes the means of providing internal and external oversight and guidance for scientific and technical direction of the research program, including but not limited to an advisory committee (required), executive committees, program committees, or their equivalent;
- Describe the availability of the EFRC Director, principal investigators, and other senior/key personnel, including discussion of their potential involvement in other major projects;
- Discuss the relevant experience of the lead organization, EFRC Director, and other senior/key personnel in project, program, and personnel management of diverse teams of science and technical professionals for projects of comparable complexity and magnitude;
- Define a proposed mechanism by which EFRC leadership will periodically evaluate the success/failure of the various components of the center;
- Define a proposed mechanism by which research thrusts will be reconfigured, including the possibility of ending activities and starting new ones, in response to key scientific challenges, promising developments, or lack of progress;
- Describe the process for making decisions on publications and intellectual property issues.

- Describe a recruiting strategy for additional scientific, technical and management personnel including new senior staff, postdoctoral researchers, and students;
- If needed, present a well-defined plan to the use of state-of-the-art technology and frequent virtual meetings to enable meaningful, efficient long distance collaboration;
- Discuss how the EFRC leadership will communicate effectively with scientists of all disciplines and promote awareness of the importance of energy science and technology;
- Include a brief overview of environmental, safety, health, and quality assurance (ES&H and QA) practices and oversight at each participating institution;
- Include a brief overview of your work planning and control process, particularly how ES&H and QA considerations are addressed prior to work being authorized;
- If applicable, provide a list of Federal, Tribal, State, and local government permits, licenses, and approvals that must be obtained.

**IV. Project Performance Site(s)** Identify and describe the site(s) where the work will be performed. For research proposed by a team, work sites at all partner institutions should be briefly described. Appendix 4 should include detailed information about facilities, equipment, and capabilities available for the research. Costs for new construction (including new buildings or additions to existing buildings) will not be allowed in the EFRC award.

#### **APPENDIX 1: BIOGRAPHICAL SKETCHES**

Provide a biographical sketch for the EFRC Director, all Principal Investigator(s), and each additional senior/key person listed in Section A on the R&R Budget form, or proposed as a subawardee or consultant, if they meet the definition of a senior/key person. The designation of multiple Principal Investigators, including Principal Investigators employed by partner institutions, is allowed.

The biographical information (curriculum vitae) for each person must not exceed three pages when printed on 8.5” by 11” paper with 1 inch margins (top, bottom, left, and right) with font not smaller than Times New Roman 12 point and must include the following information:

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

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

**Publications:** Provide a list of up to 10 publications most closely related to the proposed project. For each publication, identify the names of all authors (in the same sequence in which they appear in the publication), the article title, book or journal title, volume number, page numbers, year of publication, and website address if available electronically. Patents, copyrights, and software systems developed may be provided in addition to or substituted for publications.

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

**Identification of Potential Conflicts of Interest or Bias in Selection of Reviewers:** Provide the following information in this section:

Collaborators and Co-editors: List in alphabetical order all persons **outside of the PI's home institution**, including their current organizational affiliation, who are, or who have been, collaborators or co-authors with the PI on a research project, book or book article, report, or paper during the 48 months preceding the submission of this application. For publications or collaborations with more than 10 authors or participants, only list those individuals in the core group with whom the Principal Investigator interacted on a regular basis while the research was being done. If there are no collaborators to report, state "None." This information, excluding collaborators from collaborating institutions included in this application, is duplicated in tabular form in Appendix 9.

Graduate and Postdoctoral Advisors and Advisees: List the names and current organizational affiliations of the PI's graduate advisor(s) and principal postdoctoral sponsor(s). Also, list the names and current organizational affiliations of graduate students and postdoctoral associates that the PI has supervised during the past five years.

Advisory Committees. List all advisory committees on which the PI serves, including the name of the institution and department.

**EFRC Director Statement of Employment:** Documentation must be submitted evidencing that the proposed EFRC Director is an employee or will become an employee of the prime applicant upon award of an EFRC. The statement of employment is limited to one page and must be signed by both the EFRC Director and an authorized representative of the prime applicant. This document is not included in the three page limit for each biographical sketch.

**Individual Commitment Statement:** For the EFRC Director, each Principal Investigator, and each additional senior/key person, provide a signed statement that reflects their commitment to this project, including their individual level of time commitment, for a minimum period of five years. Multiple personnel representing the same institution may sign the same letter of commitment, as applicable. Each letter of commitment is limited to one page (this page is not included in the three page limit for each biographical sketch).

- Provide "BIOGRAPHICAL SKETCHES" as Appendix 1 to the project narrative within the same file. Do not attach a separate file.
- This appendix will not count in the Project Narrative page limitation.

## **APPENDIX 2: CURRENT AND PENDING SUPPORT**

Provide individual lists of all current and pending support (both Federal and non-Federal) for the EFRC Director, each of the PIs, all additional senior/key personnel, and subawardees, for ongoing projects and pending applications. For each award, indicate whether it is funded or pending, the organization providing the support or from which the funding is requested, the title of the award (and the identification number, if appropriate), the award period, the total award

amount for the entire award period (including indirect costs) and the number of person-months per year to be devoted to the project by the PI or senior/key person. A brief description of how the funded/requested research differs from this application must be included for each entry. Concurrent submission of an application to other organizations for simultaneous consideration will not prejudice its review.

- Provide “CURRENT AND PENDING SUPPORT” as Appendix 2 to the project narrative within the same file. Do not attach a separate file.
- This appendix will not count in the project narrative page limitation.

### **APPENDIX 3: BIBLIOGRAPHY & REFERENCES CITED**

Provide a bibliography of any references cited in the Project Narrative. Each reference must include the names of all authors (in the same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers, and year of publication. For research areas where there are routinely more than ten coauthors of archival publications, an abbreviated style may be used such as the Physical Review Letters (PRL) convention for citations (listing only the first author). For example, a paper may be listed as, “A Really Important New Result,” A. Aardvark et. al. (MONGO Collaboration), PRL 999. Include only bibliographic citations. Applicants should be especially careful to follow scholarly practices in providing citations for source materials relied upon when preparing any section of the application.

- Provide “BIBLIOGRAPHY & REFERENCES CITED” as Appendix 3 to the project narrative within the same file. Do not attach a separate file.
- This appendix will not count in the Project Narrative page limitation.

### **APPENDIX 4: FACILITIES, EQUIPMENT, & OTHER RESOURCES**

This information is used to assess the capability of the organizational resources, including subawardee resources, available to perform the effort proposed. Identify the facilities to be used (Laboratory, Animal, Computer, Office, Clinical and Other). If appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. List major items of equipment already available for this project and, if appropriate, identify location and pertinent capabilities. Describe only those resources that are directly applicable to the proposed work. Describe other resources available to the project (e.g., machine shop, electronic shop) and the extent to which they would be available to the project. For proposed investigations requiring access to experimental user facilities maintained by institutions other than the applicant, please provide a document from the facility manager confirming that the researchers will have access to the facility.

- Provide “FACILITIES, EQUIPMENT, & OTHER RESOURCES” as Appendix 4 to the project narrative within the same file. Do not attach a separate file.
- This appendix will not count in the Project Narrative page limitation.

## **APPENDIX 5: ADDITIONAL FUNDING**

Discuss any additional funding and contributions-in-kind for the proposed project, including, but not limited to, optional cost sharing. If there is no additional funding, contributions-in-kind, or cost sharing, state “None.”

- Provide “ADDITIONAL FUNDING” as Appendix 5 to the project narrative within the same file. Do not attach a separate file.
- This appendix will not count in the Project Narrative page limitation.

## **APPENDIX 6: STATEMENT OF CONFLICT OF INTEREST**

At the time of submission, the applicant shall include information identifying potential, apparent, or actual organizational and individual conflicts of interest and proposed mitigation. This shall include the applicant, their team members, and senior/key personnel named in the application. Negative responses are also required. Prior to award, DOE reserves the right to require the submission of a Conflict of Interest Management Plan describing the applicants approach to managing conflicts of interest.

- Provide “STATEMENT OF CONFLICT OF INTEREST” as Appendix 6 to the project narrative within the same file. Do not attach a separate file.
- This appendix will not count in the Project Narrative page limitation.

## **APPENDIX 7: ORGANIZATIONAL LETTERS OF COMMITMENT**

A single organizational letter of commitment is required from each organization participating as a team member. Each organizational letter of commitment is limited to one page and must be current, signed, and dated by a person authorized to commit the participating organization to a legally binding agreement for this project.

- Provide “ORGANIZATIONAL LETTERS OF COMMITMENT” as Appendix 7 to the project narrative within the same file. Do not attach a separate file.
- This appendix will not count in the Project Narrative page limitation.

## **APPENDIX 8: PUBLICATION LIST (RENEWAL APPLICATIONS ONLY)**

For renewal applications only, include a list of all archival journal publications that resulted from prior EFRC funded research. This list must be separated into two sections: 1) publications that resulted solely from EFRC support; and 2) publications that resulted from work supported by the EFRC and other funding sources. For the latter, briefly describe the portion of the work that was supported by the EFRC. Note that “solely from EFRC support” includes publications that made use of multi-user facilities (e.g., use of facilities funded by DOE, NSF-MRI, CRIF-MU, MRSEC, IMR-MIP, etc.), unless the user facility staff were research participants beyond the “normal” range of engagement of user facility staff in the research. In addition, publications can be listed as a “solely supported EFRC publication” if the only “other support” is for graduate students and postdoctoral staff who are supported on a fellowship that was awarded to them as an

individual.

- Provide “PUBLICATION LIST” as Appendix 8 to the project narrative within the same file. Do not attach a separate file.
- This appendix will not count in the Project Narrative page limitation.

**APPENDIX 9: LIST OF COLLABORATORS AND POSSIBLE CONFLICTS OF INTEREST**

In tabular form following the example below, provide a list of collaborators for all senior/key personnel, including co-authors over the past 48 months, graduate and postdoctoral advisors/advisees, and close associations. The table should *exclude* all personnel at any of the institutions participating in this application.

<b>Collaborator</b>			<b>Institution</b>
Last Name	First Name	Title	Institution Name

- Provide “LIST OF COLLABORATORS AND POSSIBLE CONFLICTS OF INTEREST” as Appendix 9 to the project narrative within the same file. Do not attach a separate file.
- This appendix will not count in the Project Narrative page limitation.

**APPENDIX 10: OTHER ATTACHMENT**

If you need to elaborate on your responses to questions 1-6 on the “Research and Related Other Project Information” document, please provide the Other Attachment information as an appendix to your project narrative. Information not easily accessible to a reviewer may be included in this appendix, but do not use this appendix to circumvent the page limitations of the application. Reviewers are not required to consider information in this appendix.

- Provide “OTHER ATTACHMENT” as Appendix 10 to the project narrative within the same file. Do not attach a separate file.
- This appendix will not count in the Project Narrative page limitation.

**Do not attach any of the requested appendices described above as files for fields 9, 10, 11, or 12. Follow the above instructions to include the information as appendices to the project narrative file. These appendices will not count toward the project narrative’s page limitation.**

### 3. Research and Related Budget

Complete the Research and Related Budget form in accordance with the instructions on the form (Activate Help Mode to see instructions) and the following instructions. You must complete a separate budget for each year of support requested. The form will generate a cumulative budget for the total project period. You must complete all the mandatory information on the form before the NEXT PERIOD button is activated. You may request funds under any of the categories listed as long as the item and amount are necessary to perform the proposed work, meet all the criteria for allowability under the applicable Federal cost principles, and are not prohibited by the funding restrictions in this FOA (See PART IV, G).

**Note:** If the prime applicant (lead organization) is a DOE/NNSA National Laboratory Contractor, the applicant must also provide the information requested in the paragraph entitled “**Budget for DOE/NNSA National Laboratory or Contractor, if applicable**” under 4. R&R Subaward Budget Attachment(s) Form (page 34 of the FOA).

#### Budget Fields

Section A Senior/Key Person	For each Senior/Key Person, enter the requested information. List personnel, base salary (annual), the number of months that person will be allocated to the project, requested salary fringe benefits, and the total funds requested for each person. The requested salary must be the product of the base salary and the effort. Include a written narrative in the budget justification that justifies the need for requested personnel.
Section B Other Personnel	List personnel, the number of person-months that person will be allocated to the project, requested salary fringe benefits, and the total funds requested for each person. Include a written narrative in the budget justification that fully justifies the need for requested personnel.
Section C Equipment	For the purpose of this budget, equipment is designated as an item of property that has an acquisition cost of \$5,000 or more and an expected service life of more than one year. List <b>each</b> item of equipment separately and justify each in the budget justification section. Do not aggregate items of equipment. Allowable items ordinarily will be limited to research equipment and apparatus not already available for the conduct of the work. General-purpose office equipment is not eligible for support unless primarily or exclusively used in the actual conduct of scientific research. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis).
Section D Travel	For purposes of this section only, travel to Canada or to Mexico is considered domestic travel. In the budget justification, list each trip’s destination, dates, estimated costs including transportation and subsistence, number of staff traveling, the purpose of the travel, and how it relates to the project. Indicate the basis for the cost estimate (quotes

	<p>from vendors or suppliers, past experience of similar items, or some other basis). To qualify for support, attendance at meetings or conferences must enhance the investigator’s capability to perform the research, plan extensions of it, or disseminate its results. Domestic travel is to be justified separately from foreign travel.</p>
<p>Section E Participant/Trainee Support Costs</p>	<p>If applicable, submit training support costs. Educational projects that intend to support trainees (precollege, college, graduate and post graduate) must list each trainee cost that includes stipend levels and amounts, cost of tuition for each trainee, cost of any travel (provide the same information as needed under the regular travel category), and costs for any related training expenses. Participant costs are those costs associated with conferences, workshops, symposia or institutes and breakout items should indicate the number of participants, cost for each participant, purpose of the conference, dates and places of meetings and any related administrative expenses. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis).</p>
<p>Section F Other Direct Costs</p>	<ul style="list-style-type: none"> <li>• <b>Materials and Supplies:</b> Enter total funds requested for materials and supplies in the appropriate fields. In the budget justification, indicate general categories such as glassware, and chemicals, including an amount for each category (items not identified under “Equipment”). Categories less than \$1,000 are not required to be itemized. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis).</li> <li>• <b>Publication Costs:</b> Enter the total publication funds requested. The application budget may request funds for the costs of documenting, preparing, publishing or otherwise making available to others the findings and products of the work conducted under the award. In the budget justification, include supporting information. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis).</li> <li>• <b>Consultant Services:</b> Enter total funds requested for all consultant services. In the budget justification, identify each consultant, the services he/she will perform, total number of days, travel costs, and total estimated costs. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis).</li> <li>• <b>ADP/Computer Services:</b> Enter total funds requested for ADP/Computer Services. The cost of computer services, including computer-based retrieval of scientific, technical and education information may be requested. In the budget justification, include the established computer service rates at the proposing organization if applicable. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis).</li> </ul>



	<ul style="list-style-type: none"> <li>• <b>Subawards/Consortium/Contractual Costs:</b> Enter total costs for all subawards/consortium organizations and other contractual costs proposed for the project. In the budget justification, justify the details.</li> <li>• <b>Equipment or Facility Rental/User Fees:</b> Enter total funds requested for Equipment or Facility Rental/User Fees. In the budget justification, identify each rental/user fee and justify. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis).</li> <li>• <b>Alterations and Renovations:</b> Enter total funds requested for Alterations and Renovations. In the budget justification, itemize by category and justify the costs of alterations and renovations, including repairs, painting, removal or installation of partitions, shielding, or air conditioning. Where applicable, provide the square footage and costs.</li> <li>• <b>Other:</b> Add text to describe any other Direct Costs not requested above. Enter costs associated with “Other” item(s). Use the budget justification to further itemize and justify.</li> </ul>
Section G Direct Costs	This represents Total Direct Costs (Sections A through F)
Section H Other Indirect Costs	Enter the Indirect Cost information for each field. Only four general categories of indirect costs are allowed/requested on this form, so please consolidate if needed. Include the cognizant Federal agency and contact information if using a negotiated rate agreement.
Section I Total Direct and Indirect Costs	This is the total of Sections G and H

BUDGET JUSTIFICATION (FIELD K ON THE FORM)

Provide the required supporting information for the following costs (See R&R Budget instructions): equipment; domestic and foreign travel; participant/trainees; materials and supplies; publication; consultant services; ADP/computer services; subaward/consortium/contractual; equipment or facility rental/user fees; alterations and renovations; and indirect cost type. Provide any other information you wish to submit to justify your budget request. **Attach a single budget justification file for the entire project period in field K.** The file automatically carries over to each budget year.

**4. R&R Subaward Budget Attachment(s) Form**

**Budgets for Subawardees:** You must provide a separate cumulative R&R budget for each subawardee, including but not limited to DOE/NNSA National Laboratory Contractors and non-DOE/NNSA Federal Agencies and their FFRDC Contractors, that is expected to perform work estimated to be more than \$100,000 or 50 percent of the total work effort (whichever is less). Note: For Subawardees expected to perform work falling below the aforementioned threshold, budget and budget explanation information should be provided as a part of the “Budget Justification” document described above. Download the R&R Budget Attachment from the

R&R SUBAWARD BUDGET FORM and e-mail it to each subawardee that is required to submit a separate budget. After the subawardee has e-mailed its completed budget back to you, attach it to one of the blocks provided on the form. Use up to 10 letters of the subawardee's name (plus .xfd) as the file name (e.g., ucla.xfd or energyres.xfd).

If a subaward is being proposed for a DOE/NNSA National Laboratory Contractor, then the applicant must also submit the appropriate Field Work Proposal and cognizant Federal Contracting Officer authorization as described in "Budget for DOE/NNSA National Laboratory Contractor" below. If a subaward is being proposed for a non-DOE/NNSA FFRDC contractor, the required authorization by the cognizant Contracting Officer for the Federal sponsoring agency, as required in Section III.B., Other Eligibility Requirements, must be submitted. Use up to 10 letters of the non-DOE/NNSA FFRDC contractor name as the file name and attach to the R&R Other Project Information form in Field 12.

**Budget for DOE/NNSA National Laboratory Contractor, if applicable:** If a DOE/NNSA National Laboratory contractor is to perform any portion of the work, as the lead organization or as a team member, the DOE/NNSA National Laboratory must provide a DOE Field Work Proposal in accordance with the requirements in DOE Order 412.1A, Work Authorization System. This order and a sample of the DOE Field Work Proposal (FWP) form are available at <https://www.directives.doe.gov/directives/412.1-BOrder-a/view>. For purposes of satisfying this requirement, applicants are required to submit the DOE FWP face and budget pages (pages 1 and 2 of the sample form) with the application as part of the Budget for DOE/NNSA National Laboratory Contractor file. Furthermore, the information requested in blocks 1. through 15. and 17. through 19. of the sample FWP must be furnished with the application. The remainder of the information requested in blocks 16., 20., and 21. of the sample form will be required to be submitted through the DOE Work Authorization System by the successful applicant after selection.

In addition, include the required cognizant Federal Contracting Officer approval authorizing the participation of the DOE/NNSA National Laboratory as described in Part III.D. This information is required in addition to the budgetary information requested herein (R&R Budget, R&R Subaward Budget, and Budget Justification, as applicable). Use up to 10 letters of the DOE/NNSA National Laboratory name as the file name and attach to the R&R Other Project Information form in Field 12.

## **5. Project/Performance Site Location(s)**

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

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

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

## **6. Disclosure of Lobbying Activities (SF-LLL)**

If applicable, complete SF-LLL. Applicability: If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal 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 SF-LLL, "Disclosure Form to Report Lobbying".

## **7. Waiver Request- (a) Foreign Entities and (b) Performance of Work in the United States (If Applicable)**

As set forth in Section III, all prime recipients (lead organizations) receiving funding under this FOA must be incorporated (or otherwise formed) under the laws of a State or territory of the United States. If a foreign entity applies for funding as a prime recipient, it must designate in the full application a subsidiary or affiliate incorporated (or otherwise formed) under the laws of a State or territory of the United States to be the prime recipient. Section III further requires that all work by the prime recipient (lead organization) under funding agreements be performed in the United States – i.e., a prime recipient must expend 100% of its total project cost in the United States.

To seek a waiver of either requirement, the applicant must submit a waiver request in the full application, which includes the following information: entity name, country (or state) of incorporation, description of the work to be performed by that entity, and the location where the work will be performed. If the applicant is seeking a waiver to have a foreign entity serve as the prime recipient, the applicant must explain why it is necessary to have a foreign entity serve as the prime recipient. If the applicant is seeking a waiver of the "Performance of Work in the United States" requirement, the applicant must explain why it is necessary to have the work performed outside of the United States. All waiver requests should explain how the waiver would further the purposes of this FOA and otherwise serve the interests of DOE. The Contracting Officer may require additional information before considering the waiver request. Use "ForEntWaiv" or "USPerfWaiv" as the file name and attach to the R&R Other Project Information form in Field 12.

## 8. Summary of Required Forms/Files

Your application must include the following items:

<b>Name of Document</b>	<b>Format</b>	<b>Attach to</b>
<b>SF 424 (R&amp;R)</b>	Form	N/A
<b>RESEARCH AND RELATED Other Project Information</b>	Form	N/A
Project Summary/Abstract	PDF	Field 7
Project Narrative, including required appendices	PDF	Field 8
Cognizant Federal Contracting Officer Approval, if applicable	PDF	Field 12
Waiver Request, if applicable	PDF	Field 12
<b>RESEARCH &amp; RELATED BUDGET</b>	Form	N/A
Budget Justification	PDF	Field K
<b>R&amp;R SUBAWARD BUDGET ATTACHMENT(S) FORM</b>	Form	N/A
<b>PROJECT/PERFORMANCE SITE LOCATION(S)</b>	Form	N/A
<b>SF-LLL Disclosure of Lobbying Activities, if applicable</b>	Form	N/A

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

## E. SUBMISSION DATES AND TIMES

### 1. Letter of Intent Due Date

November 13, 2013 at 5:00 PM Eastern Time

You are encouraged to transmit your LOI well before the deadline.

## **2. Pre-application Due Date**

Not applicable.

## **3. Application Due Date**

January 9, 2014 at 11:59 PM Eastern Time

You are encouraged to transmit your application well before the deadline.

## **4. Late Submissions**

DOE has only accepted late submissions when applicants have been unable to make timely submissions because of DOE/national technological disruptions or significant natural disasters. Other circumstances do not justify late submissions. Unacceptable justifications include, but are not limited to, the following:

- Failure to begin submission process early enough.
- Failure to provide sufficient time to complete the process.
- Failure to understand the submission process.
- Failure to understand the deadlines for submissions.
- Failure to satisfy prerequisite registrations.
- Unavailability of administrative personnel.

Applicants must contact the DOE Contact listed in Section VII.B. of this Funding Opportunity Announcement to request acceptance of a late submission.

Requests for late submission are only rarely approved.

## **F. INTERGOVERNMENTAL REVIEW**

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

## **G. FUNDING RESTRICTIONS**

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

Costs for new construction (including new buildings or additions to existing buildings) will not be allowed in the EFRC award.

**Cost Principles:** Costs must be allowable, allocable and reasonable in accordance with the applicable Federal cost principles referenced in 10 CFR 600. The cost principles for commercial organizations are in FAR Part 31 and DEAR Parts 931 and 970.31.

**Pre-award Costs:** Recipients other than DOE/NNSA National Laboratory contractors 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. 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 the applicant does not receive an award or if the award is made for a lesser amount than the applicant expected.

## **H. OTHER SUBMISSION AND REGISTRATION REQUIREMENTS**

### **1. Where to Submit**

The LOI must be submitted electronically through the DOE Office of Science Portfolio Analysis and Management System (PAMS) website at <https://pamspublic.science.energy.gov/> in order for applications to be considered for award.

Applications must be submitted through grants.gov to be considered for award.

Submit electronic applications through the “Apply for Grants” function at [www.Grants.gov](http://www.Grants.gov). If you have problems completing the registration process or submitting your application, call Grants.gov at 1-800-518-4726 or send an email to [support@grants.gov](mailto:support@grants.gov).

Please ensure that you have read the applicable instructions, guides, help notices, frequently asked questions, and other forms of technical support on grants.gov.

### **2. Registration Process**

(See also “REGISTRATIONS” on pages i to iv of this Funding Opportunity Announcement.)

#### **ONE-TIME REGISTRATION PROCESS**

You must complete the one-time registration process (all steps) before you can submit your first application through Grants.gov (See <http://www.grants.gov/web/grants/register.html>). We recommend that you start this process at least six weeks before the application due date. It may take 44 days or more to complete the entire process. Use the Grants.gov Organizational Registration Checklists at <http://www.grants.gov/documents/19/18243/OrganizationRegChecklist.pdf> to guide you through the process. During the SAM registration process, you will be asked to designate an E-Business Point of Contact (EBIZ POC). The EBIZ POC must obtain a special password called “Marketing Partner Identification Number” (MPIN). When you have completed the process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e., Grants.gov registration).

### **3. Application Receipt Notices**

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

Number 1 - Grants.gov Submission Receipt Number

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

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

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

### **4. Viewing Submitted Applications**

Each Grants.gov application submitted to the DOE Office of Science (SC) automatically transfers into PAMS and is subsequently assigned to a program manager. At the time of program manager assignment, the three people listed on the SF-424 (R&R) cover page will receive an email with the subject line, "Receipt of Proposal 0000xxxxxx by the DOE Office of Science." These three people are the Principal Investigator (Block 14), Authorized Representative (Block 19), and Point of Contact (Block 5). In PAMS notation, applications are known as proposals, the Principal Investigator is known as the PI, the Authorized Representative is known as the Sponsored Research Officer/Business Officer/Administrative Officer (SRO/BO/AO), and the Point of Contact is known as the POC.

There will be a period of time between the application's receipt at grants.gov and its assignment to a DOE Office of Science program manager. Program managers are typically assigned two weeks after applications are due at grants.gov: please refrain from attempting to view the proposal in PAMS until you receive an email providing the assignment of a program manager.

Once the email is sent, the PI, SRO/BO/PO, and POC will each be able to view the submitted proposal in PAMS. Viewing the proposal is optional.

You may use the Internet Explorer, Firefox, Google Chrome, or Safari browsers to access PAMS.

Following are two sets of instructions for viewing the submitted proposal, one for individuals who already have PAMS accounts and one for those who do not.

If you already have a PAMS account, follow these instructions:

1. Log in to PAMS at <https://pamspublic.science.energy.gov/>.
2. Click the "Proposals" tab and click "Access Previously Submitted Grants.gov Proposal."
3. Enter the following information:
  - Proposal ID: Enter the ten-digit PAMS proposal ID, including the leading zeros (e.g., 00002xxxxx). Do not use the Grants.gov proposal number. Use the PAMS number previously sent to you in the email with subject line, "Receipt of Proposal ...".

- Email (as entered in Grants.gov proposal): Enter your email address as it appears on the SF424(R&R) Cover Page.
  - Choose Role: Select the radio button in front of the role corresponding to the SF-424 (R&R) cover page. If your name appears in block 19 of the SF-424 (R&R) cover page as the authorizing representative, select “SRO/BO/AO (Sponsored Research Officer/Business Officer/Administrative Officer).” If your name appears in block 14 of the SF424 R&R cover page as the PI, select “Principal Investigator (PI).” If your name appears in block 5 of the SF424 R&R as the point of contact, select “Other (POC).”
4. Click the “Save and Continue” button. You will be taken to your “My Proposals” page. The Grants.gov proposal will now appear in your list of proposals. Click the “Actions/Views” link in the options column next to this proposal to obtain a dropdown list. Select “Proposal” from the dropdown to see the proposal. Note that the steps above will work only for proposals submitted to the DOE Office of Science since May 2012.

If you do not already have a PAMS account, follow these instructions:

1. To register, click the “Create New PAMS Account” link on the website <https://pamspublic.science.energy.gov/>.
2. Click the “No, I have never had an account” link and then the “Create Account” button.
3. You will be prompted to enter your name and email address, create a username and password, and select a security question and answer. Once you have done this, click the “Save and Continue” button.
4. On the next page, enter the required information (at least one phone number and your mailing address) and any optional information you wish to provide (e.g., FAX number, website, mailstop code, additional email addresses or phone numbers, Division/Department). Click the “Create Account” button.
5. Read the user agreement and click the “Accept” button to indicate that you understand your responsibilities and agree to comply with the rules of behavior for PAMS.
6. You will be taken to the Register to Institution page. Select the link labeled, “Option 1: My institution has submitted a proposal in Grants.gov. I am here to register as an SRO, PI, or POC (Sponsored Research Officer, Principal Investigator, or Point of Contact).”
7. Enter the following information:
  - Proposal ID: Enter the ten-digit PAMS proposal ID, including the leading zeros (e.g., 00002xxxxx). Do not use the Grants.gov proposal number. Use the PAMS number previously sent to you in the email with subject line, “Receipt of Proposal ...”.
  - Email (as entered in Grants.gov proposal): Enter your email address as it appears on the SF424(R&R) Cover Page.
  - Choose Role: Select the radio button in front of the role corresponding to the SF-424 (R&R) cover page. If your name appears in block 19 of the SF-424 (R&R) cover page as the authorizing representative, select “SRO/BO/AO (Sponsored Research Officer/Business Officer/Administrative Officer).” If your name appears in block 14 of the SF424 R&R cover page as the PI, select “Principal Investigator (PI).” If your name appears in block 5 of the SF424 R&R as the point of contact, select “Other (POC).”
8. Click the “Save and Continue” button. You will be taken to your “My Proposals” page. The Grants.gov proposal will now appear in your list of proposals. Click the “Actions/Views” link in the options column next to this proposal to obtain a dropdown list. Select “Proposal” from the dropdown to see the proposal.



If you were listed as the PI on a prior submission but you have not previously created an account, you may already be listed in PAMS. If this is the case, you will be taken to the PAMS home page after agreeing to the Rules of Behavior. If that happens, follow the instructions listed above under “If you already have a PAMS account...” to access your Grants.gov application.

The steps above will work only for application submitted to the DOE Office of Science since May 2012.

For help with PAMS, click the “External User Guide” link on the PAMS website, <https://pamspublic.science.energy.gov/>. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9 AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, Email: [sc.pams-helpdesk@science.doe.gov](mailto:sc.pams-helpdesk@science.doe.gov). The PAMS help desk is closed on Federal holidays. All submission and inquiries about this Funding Opportunity Announcement should reference **DE-FOA-0001010**.

## **Section V - APPLICATION REVIEW INFORMATION**

### **A. CRITERIA**

#### **1. Initial Review Criteria**

Prior to a comprehensive merit evaluation, DOE will perform an initial review in accordance with 10 CFR 605.10(b) to determine that (1) the applicant is eligible for the award; (2) the information required by the FOA has been submitted; (3) all mandatory requirements are satisfied; and (4) the proposed project is responsive to the objectives of the funding opportunity announcement. In particular, to be responsive to the objectives of this FOA, the research proposed in the EFRC application **must**:

- (1) address one or more of the “grand challenges” described in the BESAC report *Directing Matter and Energy: Five Challenges for Science and the Imagination* (<http://science.energy.gov/bes/news-and-resources/reports/abstracts/#GC>); and
- (2) address one or more of the energy challenges described in the BES *Basic Research Needs* workshop report series (<http://science.energy.gov/bes/news-and-resources/reports/>).

**Applications that fail to pass the initial review will not be forwarded for merit review and will be rejected without further review.**

#### **2. Merit Review Criteria**

Applications will be subjected to scientific merit review (peer review) and will be evaluated by Merit Review Panels against the following seven criteria, the first five of which will be weighted more heavily than the final two (the questions after each are intended to guide the reviewers; reviewers will not be required to provide written responses to each of them):

#### **SCIENTIFIC AND/OR TECHNICAL MERIT OF THE PROPOSED RESEARCH**

- Does the research proposed for the EFRC lie at the scientific forefront of one or more of the “grand challenges” described in the BESAC report *Directing Matter and Energy: Five Challenges for Science and the Imagination* (<http://science.energy.gov/bes/news-and-resources/reports/abstracts/#GC>)?
- Does the research proposed for the EFRC address one or more of the energy challenges described in the BES workshop reports in the *Basic Research Needs* series (<http://science.energy.gov/bes/news-and-resources/reports/>) in an effective and impactful manner?
- Does the application contain clearly defined five-year scientific research goals for the EFRC?
- Do the scientific goals of the EFRC have sufficient programmatic focus to justify the center?
- Does the application present a balanced and comprehensive program of basic research that, as needed, supports experimental, theoretical, and computational efforts and development of new capabilities and approaches in these areas?

- Is the proposed research program likely to meet the stated five-year scientific research goals of the EFRC?
- If applicable, does the proposed research embody the scientific approaches detailed in the following reports: *Computational Materials Science and Chemistry: Accelerating Discovery and Innovation through Simulation-Based Engineering and Science* (<http://science.energy.gov/bes/news-and-resources/reports/abstracts/#CMSC>) and *From Quanta to the Continuum: Opportunities for Mesoscale Science* (<http://science.energy.gov/bes/news-and-resources/reports/abstracts/#OFMS>)?
- For renewal applications only, has the progress made by the EFRC since it was initiated in 2009, been commensurate with the level of support and have the scientific results had significant impact on the fields in which the center is operating?

#### **APPROPRIATENESS OF THE PROPOSED METHOD OR APPROACH**

- Are the strategy and the plan for the development and operation of the proposed EFRC, including the need for an EFRC approach involving several senior/key personnel, the means for achieving an integrated EFRC, and plans for leadership and guidance for the scientific and technical direction, appropriate?
- Does the application present an integrated research center that embodies the “team science” approach in which the research challenges to be addressed are those that are likely to be overcome only by a centrally managed, multi-disciplinary team?
- Are the proposed scientific methods or approaches detailed in the proposal appropriate to achieve the stated scientific goals of the EFRC?
- Are the plans (if any) for external collaborations and partnerships reasonable and appropriate?
- Are the roles and intellectual contributions of the EFRC Director, Principal Investigator(s), and all other senior/key personnel adequately described and appropriate?

#### **STRENGTH OF THE EFRC MANAGEMENT PLAN**

- Is there a clear lead organization and a qualified EFRC Director?
- Does the applicant present a comprehensive management plan that encourages synergy and cohesion among investigators by infusing a culture of empowered central research management throughout the EFRC?
- What is the likelihood that the applicant can overcome key scientific challenges and shift research directions in response to promising developments? Has the application presented a clearly defined mechanism to evaluate success/failure and to reconfigure research thrusts as needed?
- If needed, is there a well-defined plan to the use of state-of-the-art technology and frequent virtual meetings to enable meaningful, efficient long distance collaboration?
- Does the applicant present an organizational structure that delineates the roles and responsibilities of senior/key personnel and describes the means of providing external oversight and guidance for scientific and technical direction of the research program?

- Is the role of an advisory committee (required) and any executive committee, program committee, or their equivalent adequately described and appropriate?
- Are environment, safety and health (ES&H) issues responsibly anticipated and addressed? Does the applicant have a work planning and control process which considers them?
- Is the importance of quality assurance principles and practices recognized and are key applications described?

#### **SYNERGY AMONG THE PIs, INCLUDING COHESION AND INTEGRATION OF THE RESEARCH ACTIVITIES**

- Does the application describe a well-integrated team based approach to addressing the scientific goals?
- Is the proposed team of researchers likely to work together in a cohesive and integrated manner? Have they demonstrated their ability to do so in the past?
- Have the applicants defined scientific problems that are likely to be addressed only through close collaboration among the researchers on the application?
- Are the elements of the proposed research appropriately integrated, coordinated, and synergistic?

#### **COMPETENCY OF APPLICANT'S PERSONNEL AND ADEQUACY OF PROPOSED RESOURCES**

- Do the applicant's senior/key personnel have a proven record of research in the disciplines needed for success in this project?
- Do the lead organization, the EFRC Director, and the other senior/key personnel for the EFRC have proven records of success in project, program, and personnel management of diverse teams of scientific and technical professionals for projects of comparable complexity and magnitude?
- Is the plan for recruiting any additional scientific and technical personnel including new senior staff, students and postdocs reasonable and appropriate?
- Is the proposed access to existing research space, instrumentation and facilities at the partner institutions likely to meet the needs of the proposed EFRC?
- Is there adequate access to experimental and computational capabilities as needed to ensure successful completion of the proposed research, including access to research capabilities and resources outside of the EFRC?
- Will the EFRC leadership communicate effectively with scientists of all disciplines and promote awareness of the importance of energy science and technology?
- Will the EFRC Director and senior/key personnel be sufficiently available given their role in the EFRC, particularly taking into account their potential involvement in other major projects?

#### **REASONABLENESS AND APPROPRIATENESS OF THE PROPOSED BUDGET**

- Is the requested operating budget and the distribution of the funds among research tasks/themes and partners reasonable for the planned scientific program?

- Does the budget include support for the appropriate personnel to carry out the proposed research?
- Are the equipment needs adequately identified, and costs for needed new instrumentation or upgrades realistically estimated?
- Are the budgeted costs for preparing space for existing and new equipment and instrumentation appropriate and reasonable?
- Are all subcontracts, travel, student costs and other ancillary expenses adequately estimated and justified?

#### **DEVELOPMENT AND UTILIZATION OF UNIQUE FACILITIES, CAPABILITIES OR APPROACHES**

- Does the proposed research rely on the use of unique facilities at the applicants' home institutions or at US or international user facilities?
- Have the applicants proposed the development of unique facilities, capabilities, or approaches to achieve the stated scientific goals?

### **B. REVIEW AND SELECTION PROCESS**

#### **1. Merit Review**

Applications that pass the initial review for eligibility and responsiveness to the FOA will be subjected to formal merit review and will be evaluated based on the criteria stated above in Section V.A.2.

Following completion of the merit review, a team of Federal officials will review the applications and the evaluations of the Merit Review Panels, summarize the Merit Review Panel members' independent evaluations of the applications submitted, and recommend the application of the program policy factors, as appropriate. The evaluation process may include consideration of any of the program policy factors listed below, such as the relevance of the proposed research to the terms of the FOA and the agency's programmatic needs (see below). External peer reviewers are selected with regard to both their scientific expertise and the absence of conflict-of-interest issues. Both Federal and non-Federal reviewers may be used, and submission of an application constitutes agreement that this is acceptable to the investigator(s) and the submitting institution.

#### **2. Selection**

The Selection Official will consider the findings of the Merit Review Panels and the recommendations of Federal officials, as well as the following program policy factors:

- Delineation of the scope of the proposed EFRC research from other research activities in which the principal investigators are involved, particularly those supported by DOE and by other federal agencies
- Relevance of the proposed activity to Office of Basic Energy Sciences (BES) priorities

- Ensuring an appropriate balance of activities within BES programs
- Diversity of research activities that will address the scientific grand challenges and use-inspired basic research as articulated in the BESAC and BES workshop reports
- Relationship of the proposed EFRC to other research and development programs in DOE, including but not limited to the Energy Innovation Hubs and the core research activities within the BES Materials Sciences and Engineering Division and Chemical Sciences, Geosciences and Biosciences Division
- Potential for developing synergies between the proposed EFRC and other EFRCs or other ongoing BES research activities
- For renewal applications, progress made by the EFRC during the preceding project period and the impact of the research

As part of the selection process, DOE reserves the right to seek clarifications in writing from those applications deemed to have the highest scientific merit in order to facilitate the selection process.

### **3. Discussions and Award**

The Government may enter into discussions with a selected applicant for any reason deemed necessary, including but not limited to the following: (1) Reasonableness and appropriateness of the budget; (2) Possible selection of only portion of the application for award; (3) Request from additional information to determine whether the recipient is capable of complying with the requirements in 10 CFR 600 and 10 CFR 605; and/or (4) The necessity of adding special terms and conditions as a prerequisite for award. Failure to satisfactorily resolve the issues identified by the Government will preclude award to the applicant.

### **C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES**

DOE anticipates notifying the applicants selected for award in June 2014 and making awards by September 2014.

## **Section VI - AWARD ADMINISTRATION INFORMATION**

### **A. AWARD NOTICES**

#### **1. Notice of Selection**

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

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

#### **2. Notice of Award**

If a selected applicant is not a DOE/NNSA National Laboratory, other Federal Agency, or Non-DOE/NNSA FFRDC contractor, an Assistance Agreement issued by the contracting officer is the authorizing award document. It normally includes, either as an attachment or by reference, the following items: (1) Special Terms and Conditions; (2) Applicable program regulations at 10 CFR 605; (3) Application as approved by DOE; (4) DOE assistance regulations at 10 CFR 600, and, if applicable, the Government-wide Research Terms and Conditions, and DOE Agency Specific Requirements; (5) National Policy Assurances To Be Incorporated As Award Terms; (6) Budget Summary; and (7) Federal Assistance Reporting Checklist, which identifies the reporting requirements.

If a selected applicant is a DOE/NNSA National Laboratory contractor, DOE will fund the DOE/NNSA National Laboratory through the DOE field work authorization system or other appropriate process. DOE/NNSA National Laboratories participating as team members of other selected applicants' projects will be funded by field work authorization or other appropriate process.

Non-DOE/NNSA FFRDC contractors and other Federal agencies, if part of a selected applicant's project, will be funded under an interagency agreement.

### **B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS**

#### **1. Administrative Requirements**

The administrative requirements for DOE grants and cooperative agreements are contained in 10 CFR 600 and 10 CFR 605, which are located on the U.S. Government Printing Office web site at <http://www.ecfr.gov>. Grants and cooperative agreements made to universities, non-profits and other entities subject to 2 CFR 215 are subject to the Research Terms and Conditions located on the National Science Foundation web site at <http://www.nsf.gov/bfa/dias/policy/rtc/index.jsp> .

## **DUNS AND CCR REQUIREMENTS**

Additional administrative requirements for DOE grants and cooperative agreements are contained in 2 CFR 25 (See: <http://www.ecfr.gov>). Prime awardees must keep their data at the System for Award Management (SAM) current at <http://www.sam.gov>. SAM is the government-wide system that replaced the Central Contractor Registry (CCR). If you had an active registration in the CCR, you have an active registration in SAM. Subawardees at all tiers must obtain DUNS numbers and provide the DUNS to the prime awardee before the subaward can be issued.

## **SUBAWARD AND EXECUTIVE REPORTING**

Additional administrative requirements necessary for DOE grants and cooperative agreements to comply with the Federal Funding and Transparency Act of 2006 (FFATA) are contained in 2 CFR 170. (See: <http://www.ecfr.gov>). Prime awardees must register with the new FSRS database and report the required data on their first tier subawardees. Prime awardees must report the executive compensation for their own executives as part of their registration profile in the System for Award Management (SAM).

## **PROHIBITION ON LOBBYING ACTIVITY**

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

## **2. National Policy Assurances**

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

## **3. Terms and Conditions**

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

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



#### **4. Additional Special Terms and Conditions**

##### **a. CONFERENCE SPENDING (APRIL 2013)**

The recipient shall not expend funds for the purpose of defraying the cost to the United States Government of a conference [described in subsection (c) of the Consolidated and Further Continuing Appropriations Act, 2013] that was more than \$20,000, or circumventing the required notification by the head of any such Executive Branch department, agency, board, commission, or office to the Inspector General or senior ethics official for any entity without an Inspector General, of the date, location, and number of employees attending such conference that is not directly and programmatically related to the purpose for which the grant or cooperative agreement was awarded.

##### **b. CORPORATE FELONY CONVICTION AND FEDERAL TAX LIABILITY REPRESENTATIONS (MARCH 2012)**

In submitting an application in response to this FOA the Applicant represents that:

- (1) It is not a corporation that has been convicted (or had an officer or agent of such corporation acting on behalf of the corporation convicted) of a felony criminal violation under any Federal law within the preceding 24 months,
- (2) No officer or agent of the corporation have been convicted of a felony criminal violation for an offense arising out of actions for or on behalf of the corporation under Federal law in the past 24 months,
- (3) It is not a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

For purposes of these representations the following definitions apply:

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

**c. APPLICANT LIGHTING EFFICIENCY CERTIFICATION (APRIL 2012)**

In submitting an new application in response to this FOA the Applicant certifies that if chosen for a new grant award and the award is in excess of \$1,000,000 it will, by the end of the Federal Government’s fiscal year, upgrade the efficiency of its facilities by replacing any incandescent lighting of the type for which section 325 of the Energy Policy and Conservation Act (42 USC 6295) establishes a standard that does not meet or exceed the energy efficiency standard for incandescent light bulbs set forth in that section with a lamp that meets or exceeds the standards for lamps established in or pursuant to that section.

Incandescent reflector lamps shall meet or exceed the lamp efficacy standards shown in the table:

Rated lamp wattage	Lamp spectrum	Lamp diameter (inches)	Rated voltage	Minimum average lamp efficacy (lm/W)
40–205	Standard Spectrum	>2.5	≥125V	$6.8 * P^{0.27}$
			<125V	$5.9 * P^{0.27}$
		≤2.5	≥125V	$5.7 * P^{0.27}$
			<125V	$5.0 * P^{0.27}$
40–205	Modified Spectrum	>2.5	≤125V	$5.8 * P^{0.27}$
			<125V	$5.0 * P^{0.27}$
		≤2.5	≥125V	$4.9 * P^{0.27}$
			<125V	$4.2 * P^{0.27}$

**Note 1:** P is equal to the rated lamp wattage, in watts.

**Note 2:** Standard Spectrum means any incandescent reflector lamp that does not meet the definition of modified spectrum in 10 CFR 430.2.

Subject to the exemption below, the standards specified in this section shall apply to ER incandescent reflector lamps, BR incandescent reflector lamps, BPAR incandescent reflector lamps, and similar bulb shapes.

Subject to the exemption below, the standards specified in this section shall apply to incandescent reflector lamps with a diameter of more than 2.25 inches, but not more than 2.75 inches.

Exemption: The standards specified in this section shall not apply to the following types of incandescent reflector lamps:

- (A) Lamps rated at 50 watts or less that are ER30, BR30, BR40, or ER40 lamps;
- (B) Lamps rated at 65 watts that are BR30, BR40, or ER40 lamps; or
- (C) R20 incandescent reflector lamps rated 45 watts or less.

For purposes of this Certification, the following definitions apply:

- (A) Facilities mean the room(s), area(s), or building(s) that are used to complete a majority of the work under the project.
- (B) In excess of \$1,000,000 means the total value of the grant including all budget periods funded with Federal funds and recipient cost share is greater than \$1,000,000.
- (C) Federal Government's fiscal year begins October 1<sup>st</sup> and ends September 30<sup>th</sup>.
- (D) Except as provided in subparagraph (4) below, the term "incandescent lamp" means a lamp in which light is produced by a filament heated to incandescence by an electric current, including only the following:
  - (1) Any lamp (commonly referred to as lower wattage nonreflector general service lamps, including any tungsten-halogen lamp) that has a rated wattage between 30 and 199 watts, has an E26 medium screw base, has a rated voltage or voltage range that lies at least partially within 115 and 130 volts, and is not a reflector lamp.
  - (2) Any lamp (commonly referred to as a reflector lamp) which is not colored or designed for rough or vibration service applications, that contains an inner reflective coating on the outer bulb to direct the light, an R, PAR, ER, BR, BPAR, or similar bulb shapes with E26 medium screw bases, a rated voltage or voltage range that lies at least partially within 115 and 130 volts, a diameter which exceeds 2.25 inches, and has a rated wattage that is 40 watts or higher.
  - (3) Any general service incandescent lamp (commonly referred to as a high- or higher-wattage lamp) that has a rated wattage above 199 watts (above 205 watts for a high wattage reflector lamp).
  - (4) The term "incandescent lamp" does not include any lamp excluded by the Secretary, by rule, as a result of a determination that standards for such lamp would not result in significant energy savings because such lamp is designed for special applications or has special characteristics not available in reasonably substitutable lamp types.

- (E) The term “base” means the portion of the lamp which connects with the socket as described in ANSI C81.61–1990.
- (F) The term “bulb shape” means the shape of lamp, especially the glass bulb with designations for bulb shapes found in ANSI C79.1–1980 (R1984).
- (G) The term “lamp efficacy” means the lumen output of a lamp divided by its wattage, expressed in lumens per watt (LPW or lm/W).
- (H) The term “lamp wattage” means the total electrical power consumed by a lamp in watts, after the initial seasoning period referenced in the appropriate IES standard test procedure and including, for fluorescent, arc watts plus cathode.

### **C. REPORTING**

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

## Section VII - QUESTIONS/AGENCY CONTACTS

### A. QUESTIONS

Questions relating to the grants.gov registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or [support@grants.gov](mailto:support@grants.gov). DOE cannot answer these questions. Please contact the grants.gov help desk only for questions related to grants.gov.

For help with PAMS, click the “External User Guide” link on the PAMS website, <https://pamspublic.science.energy.gov/>. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, Email: [sc.pams-helpdesk@science.doe.gov](mailto:sc.pams-helpdesk@science.doe.gov). All submission and inquiries about this Funding Opportunity Announcement should reference **DE-FOA-0001010**. Please contact the PAMS help desk for technological issues with the PAMS system.

Questions regarding the content of this FOA **must** be submitted through the FedConnect portal. You must register with FedConnect and respond as an interested party to submit questions, and to view responses to questions. It is recommended that you register as soon after release of the FOA as possible to have the benefit of all responses. More information is available at <https://www.fedconnect.net>.

Due to the time required to provide complete and accurate answers to questions, all questions **must** be submitted through FedConnect no later than **12:00 Noon Eastern Time on December 10, 2013**. DOE will not respond to questions submitted after the designated time on December 10, 2013.

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

### B. AGENCY CONTACTS

Grants.gov Customer Support	800-518-4726 (toll-free) <a href="mailto:support@grants.gov">support@grants.gov</a>
PAMS Customer Support	855-818-1846 (toll-free) 301-903-9610 <a href="mailto:sc.pams-helpdesk@science.doe.gov">sc.pams-helpdesk@science.doe.gov</a>
DOE Contact	Michael Hill <a href="mailto:michael.hill@ch.doe.gov">michael.hill@ch.doe.gov</a>

## **Section VIII - OTHER INFORMATION**

### **A. MODIFICATIONS**

Notices of any modifications to this FOA will be posted on Grants.gov and the FedConnect portal. You can receive an email when a modification or an FOA 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 FOAs. More information is available at <http://www.fedconnect.net>.

### **B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE**

DOE reserves the right, without qualification, to reject any or all applications received in response to this FOA 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 shall be used or disclosed only for evaluation purposes, provided that if this applicant receives an award as a result of or in connection with the submission of this application, DOE shall have the right to use or disclose the data herein to the extent provided in the award. This restriction does not limit the government’s right to use or disclose data obtained without restriction from any source, including the applicant.”

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

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

## **E. EVALUATION AND ADMINISTRATION BY NON-FEDERAL PERSONNEL**

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

## **F. INTELLECTUAL PROPERTY DEVELOPED UNDER THIS PROGRAM**

**Patent Rights:** The government will have certain statutory rights in an invention that is conceived or first actually reduced to practice under a DOE award. The Federal Non Nuclear Energy Act of 1974, 42 USC 5908 provides that title to such inventions vests in the United States, except where 35 USC 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 developed 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.

## **G. NOTICE OF RIGHT TO REQUEST PATENT WAIVER**

Under 42 U.S.C. § 5908, title to subject inventions vests in the United States Government and large businesses and foreign entities do not have the automatic right to elect to retain title to subject inventions. However, Applicants may request a waiver of all or any part of the rights of the United States in identified inventions, i.e., individual inventions conceived or first actually reduced to practice in performance of an agreement as a result of this FOA. Any patent waiver that may be granted is subject to certain terms and conditions in 10 CFR 784. For more information, see <http://energy.gov/gc/patents-licensing-and-patent-waivers>.

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

## **H. NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES**

Eligible activities under this program include those which describe and promote the understanding of scientific and technical aspects of specific energy technologies, but not those

which encourage or support political activities such as the collection and dissemination of information related to potential, planned or pending legislation.

## **I. PROPERTY**

**Real property:** With respect to the use, management, and disposition of all real property, 10 CFR 600.132 shall be applicable to grants and subawards with institutions of higher education, hospitals, and other non-profit organizations; and 10 CFR 600.321 shall be applicable to grants and subawards with for-profit organizations. For DOE/NNSA contractors, the terms and conditions of the respective Management and Operating contract will apply. For non-DOE/NNSA FFRDC contractors and other Federal agencies, the terms and conditions of the interagency agreement will apply.

**Personal Property: Federally Owned and Exempt, Equipment, and Supplies and Other Expendable Property:** With respect to the use, management and disposition of all personal property, 10 CFR 600.133, 134 and 135 shall be applicable to grants and subawards with institutions of higher education, hospitals, and other non-profit organizations; and 10 CFR 600.321, 322, 323 and 324 shall be applicable to grants and subawards with for-profit organizations. For DOE/NNSA contractors, the terms and conditions of the respective Management and Operating contract will apply. For non-DOE/NNSA FFRDC contractors and other Federal agencies, the terms and condition of the interagency agreement will apply.

## **J. ENVIRONMENTAL, SAFETY AND HEALTH (ES&H) PERFORMANCE OF WORK AT DOE FACILITIES**

With respect to the performance of any portion of the work under this award which is performed at a DOE-owned or controlled site, the recipient agrees to comply with all state and Federal ES&H regulations, and with all other ES&H requirements of the operator of such site. The recipient shall apply this provision to all subawardees at any tier.

## **K. NATIONAL ENVIRONMENTAL POLICY ACT COMPLIANCE**

If the disclosure on the “Research and Related Other Project Information” document indicates “potential impact on the environment,” or if DOE’s own review indicates it, DOE may ask the applicant to provide additional information on those impacts in order to prepare an environmental critique/synopsis per 10 CFR 1021.216. Note that this pre-award environmental critique/synopsis process would be separate from the preparation of a NEPA document such as an environmental impact statement or an environmental assessment, which may occur post-award. If DOE determines it is necessary, this latter process would need to be completed, both funded by and with the participation of the awardee, prior to them taking any action on the proposed project that could have adverse environmental effect or that could limit the choice of reasonable alternatives. The inability to satisfy the NEPA requirements after an award would result in cancellation of any said award.



## **L. AVAILABILITY OF FUNDS**

Funds are not presently available for this award.

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

No legal liability on the part of the Government for any payment may arise until funds are made available to the Contracting Officer for this award and until the awardee receives notice of such availability, to be confirmed in writing by the Contracting Officer.