

**FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT**



U. S. Department of Energy

Office of Basic Energy Sciences

Energy Frontier Research Centers

Funding Opportunity Number: DE-PS02-08ER15944

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Pre-Application Due Date:	Not Applicable
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DATE: September 3, 2008

FROM: Vicki L. Phillips, Contracting Officer

TO: All Prospective Applicants

SUBJECT: Amendment No. 003 to Funding Opportunity Announcement No. DE-PS02-08ER15944, Energy Frontier Research Centers

The Funding Opportunity Announcement (FOA) is amended as follows:

1. Part I, Section F. entitled “Definitions” is revised to allow applicants to identify multiple EFRC Directors, or Co-EFRC Directors, in an application. As a result, the definition provided for the “EFRC Director” in Part I, Section F. entitled “Definitions” is deleted in its entirety and replaced with the following:

“EFRC Director: The EFRC Director is the lead Principal Investigator and must be employed by the lead institution. The EFRC Director will serve as the primary contact responsible for communications with the DOE Program Officer on behalf of all of the Principal Investigators in the EFRC. The EFRC Director and the DOE Program Officer may establish an agreement for informal technical discussion or information exchange among Principal Investigators and DOE staff. Multiple EFRC Directors, or Co-EFRC Directors, may be named in an application to share the responsibilities as lead Principal Investigator. Each Co-EFRC Director must be employed by the lead institution.”

2. Part III, Section C. entitled “Other Eligibility Requirements” is revised to: a) require the designated lead organization to perform a greater percentage of effort than any individual team member or subawardee; b) clarify the eligibility requirements with respect to the participation of non-DOE/NNSA Federal agencies and their FFRDC contractors as vendors; and c) extend the eligibility requirement limiting the number of applications submitted to the Co-EFRC Director in addition to the EFRC Director. As a result, the paragraphs entitled “Team Arrangements,” “Eligible/Ineligible Entities,” and “Limitation on Number of Applications Submitted by an EFRC Director” in Part III, Section C. entitled “Other Eligibility Requirements” are deleted in their entirety and replaced with the following:

“Team Arrangements

Entities proposing as a team must designate a lead organization. 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. The designated lead organization, i.e., the prime applicant, must perform a greater percentage of the effort than any individual team member or subawardee. **If an application is received whereby the prime applicant is not performing a greater percentage of the effort than one or more individual team members or subawardees, the application will be deemed non-responsive and rejected without further review.”**

“Eligible/Ineligible Entities

With the exception of foreign entities, the definition of Eligible Applicants set forth above in Part III, Section A. applies to all parties involved in an application, including the lead organization that actually submits the application (prime applicant) and all other institutions involved in any way in the proposed EFRC (team members and/or subcontractors). Foreign entities may not be the lead applicant, but may be proposed as a team member and/or subcontractor. In accordance with Section 989 of EPA Act 2005, DOE/NNSA National Laboratory contractors are the only types of FFRDC contractors eligible to participate. Except for the provision of vendor materials, supplies, equipment, space, and scientific and technical advisory services, non-DOE/NNSA Federal agencies and their FFRDC contractors may not be included in applications as participants at any level, including unfunded scientific collaborators.

Additionally, nonprofit organizations described in section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995, may not be the lead applicant, team members, and/or subcontractors; nor be involved in any way in the application.

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 subcontractor, or as an unfunded contributor to the project, the application will be deemed non-responsive and rejected without further review. Note, however, that non-DOE/NNSA Federal agencies and their FFRDC contractors are not precluded from serving as vendors of materials, supplies, equipment, space 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. In the event that a non-DOE/NNSA Federal agency and/or their FFRDC contractor will serve as a vendor of materials, supplies, equipment, space and/or scientific and technical advisory services to a proposed EFRC, the applicant must submit evidence of the non-DOE/NNSA Federal agencies authority and agreement to provide said items to DOE with the initial application. **If an application is received that fails to include the non-DOE/NNSA Federal agencies authority and agreement to serve as a vendor, the application will be deemed non-responsive and rejected without further review**

In the event that other Federal agencies and/or their FFRDC contractors provide materials, supplies, equipment, space or scientific and technical advisory services, DOE may fund such entities through an interagency agreement under the Economy Act.”

“Limitation on Number of Applications Submitted by an EFRC Director

The EFRC Director is the lead Principal Investigator and must be employed by the lead institution. An individual may not be named as the EFRC Director and/or Co-EFRC Director on more than one application. If the proposed EFRC Director or Co-EFRC Director will not be employed by the lead institution, 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 or Co-EFRC Director, DOE will consider the initial application received based on the Grants.gov date and time stamp. The remaining applications will be deemed non-responsive and rejected without further review. However, there is no restriction on the number of applications an individual may submit as a Principal Investigator.”

3. The Project Narrative in Part IV, Section C. 2. entitled “Research and Related (R&R) Other Project Information” is revised to clarify the environmental, health, and safety information requested to be included in the Project Narrative under I. EFRC Management Plan. As a result, the Project Narrative’s 14th bullet under I. EFRC Management Plan is deleted in its entirety and replaced with the following:

“A brief overview of environmental, health, and safety practices and oversight at each participating institution;”

4. The Project Narrative in Part IV, Section C. 2. entitled “Research and Related (R&R) Other Project Information” is revised to clarify the requested research description in the Project Narrative under II. Proposed Research. As a result, the introductory sentences under II. Proposed Research of the Project Narrative are deleted in their entirety and replaced with the following:

“II. Proposed Research Applicants must provide detailed information regarding the research proposed for the EFRC. This section, which may be organized in the subtasks, must clearly describe the proposed research and:”

5. The Project Narrative in Part IV, Section C. 2. entitled “Research and Related (R&R) Other Project Information” is revised to amend the required contents of Appendix 1: Biographical Sketch to require the submission of an EFRC Director Statement of Employment and remove the requirement to include organizational letters of commitment in the Biographical Sketch. As a result, the subparagraph in Appendix 1: Biographical Sketch entitled “Commitment Statement” is deleted in its entirety and replaced with the following two paragraphs:

“EFRC Director Statement of Employment: For the EFRC Director or Co-EFRC Director(s), submit documentation stating that the proposed EFRC Director or Co-EFRC Director is an employee of the prime applicant. 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 each senior/key person, including the EFRC Director(s) and Principal Investigator(s), provide a signed commitment 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).”

6. The Project Narrative in Part IV, Section C. 2. entitled “Research and Related (R&R) Other Project Information” is revised to amend the submission requirements for Appendix 6 when cost sharing is proposed. Since cost sharing is not required, the SF 424 R&R Budget forms included in the application package do not allow for proposed cost sharing. Therefore, all cost information related to voluntary cost sharing must be submitted as Appendix 6 to the Project Narrative. As a result, the Project Narrative’s Appendix 6 entitled “Third Parties Contributing to Cost Sharing” is deleted in its entirety and replaced with the following:

“Appendix 6: Cost Sharing

Although cost sharing is not required, if you are proposing cost sharing as part of your response to the funding opportunity announcement, you must include a separate budget form or spreadsheet itemizing the proposed cost share for each year of the proposed project period utilizing the categories listed in the Research and Related Budget form. In addition, you must include a letter from each third party contributing to cost sharing (i.e., a party other than the organization submitting the application) at the time you submit your application. The letter must state that the third party is committed to providing a specific single dollar amount of cost sharing together with the percentage of your proposed project costs your cost sharing commitment represents. By submitting your application, you are providing assurance that you have signed letters of commitment. If cost sharing is proposed, you must provide the requested budget forms or spreadsheets, a budget justification for the categories of costs to be shared, and an explanation of the source, nature, amount, and availability of any proposed cost sharing. For each third party contributing to cost sharing, identify: (1) the name of the organization; (2) the proposed dollar amount to be provided; (3) the amount as a percentage of the total project cost; and (4) the proposed cost sharing – cash, services, or property. Please provide this information as an appendix to your project narrative. **Do not attach a separate file. This appendix will not count in the project narrative page limitation.”**

7. The Project Narrative in Part IV, Section C. 2. entitled “Research and Related (R&R) Other Project Information” is revised to incorporate an additional appendix to require the submission of organizational letters of commitment previously removed from the contents of Appendix 1: Biographical Sketch. As a result, the following paragraph is added as Appendix 9 to the Project Narrative and the previous Appendix 9: Other Attachments is renumbered as Appendix 10 as follows:

“Appendix 9: Organizational Letters of Commitment

A single organizational letter of commitment is required from each organization participating as a team member. Each letter of commitment from an organization participating as a team member must be signed by the person authorized to commit the organization to a legally binding agreement. Each organizational letter of commitment is limited to one page. **Do not attach a separate file. This appendix will not count in the project narrative page limitation.**

Appendix 10: Other Attachments”

8. Part IV, Section C. 3. entitled “Research and Related (R&R) Budget” is revised to amend the contents of the Budget Justification file to impose additional documentation submission requirements when a non-DOE/NNSA Federal agency and/or their FFRDC contractor will participate as a vendor. As a result, the paragraph entitled “Budget Justification (Field K on the form)” in Part IV, Section C.3. is deleted in its entirety and replaced with the following:

“Budget Justification (Field K on the form).

Provide the required supporting information for the following costs (See R&R instructions): equipment; domestic and foreign travel; participant/trainees; material 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. If a non-DOE/NNSA Federal agency and/or their FFRDC contractor will serve as a vendor of materials, supplies, equipment, space and/or scientific and technical advisory services to a proposed EFRC, submit evidence of the non-DOE/NNSA Federal agencies authority and agreement to provide said items to DOE as part of the budget justification file. Attach a single budget justification file for the entire project period in Field K. The file automatically carries over to each budget year.”

9. Part IV, Section D. entitled “Submission From Successful Applicant” is revised to amend the description of information related to cost sharing. As a result, the 5th bullet in Part IV, Section D. is deleted in its entirety and replaced with the following:

“Cost Sharing Contributions, if applicable”

10. The paragraph entitled “Other Selection Factors” Part V, Section A. is revised to delete cost sharing as a program policy and management factor to be considered by the Selection Official. As a result, the fourth bullet, i.e., “Proposed cost sharing” is deleted in its entirety.

11. Part VI, Section A.2. entitled “Notice of Award” is revised to clarify the applicability of both 10 CFR Part 600 and the Federal Demonstration Partnership (FDP) terms and conditions to awards with FDP participants. As a result, item 4. is deleted in its entirety and replaced with the following:

“4. DOE assistance regulations at 10 CFR Part 600, and, for Federal Demonstration Partnership (FDP) institutions, the FDP terms and conditions;”

12. All references to the “Research and Related (R&R) Budget (Total Fed + Non-Fed)” and “R&R Subaward Budget (Total Fed + Non-Fed)” forms are replaced by the “R&R Budget” and “R&R Subaward Budget” forms throughout the FOA.

END OF AMENDMENT

THE FULL TEXT OF THE FUNDING OPPORTUNITY ANNOUNCEMENT, AS AMENDED THROUGH AMENDMENT NO. A003, DATED SEPTEMBER 3, 2008, IS ATTACHED.

NOTE: NEW REQUIREMENTS FOR GRANTS.GOV

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

Registration Requirements: There are several one-time actions you must complete in order to submit an application through Grants.gov (e.g., obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number, register with the CCR, register with the credential provider, and register with Grants.gov). See <http://www.grants.gov/GetStarted>. Use the Grants.gov Organization Registration Checklist at <http://www.grants.gov/assets/OrganizationRegCheck.pdf> to guide you through the process. Designating an E-Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in the CCR registration process. Applicants, who are not registered with CCR and Grants.gov, should allow at least 21 days to complete these requirements. It is suggested that the process be started as soon as possible.

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

MICROSOFT VISTA AND OFFICE 2007 INCOMPATIBILITY: Grants.gov is currently incompatible with both the new Microsoft (MS) Vista Operating System and the new Microsoft (MS) Office 2007 versions of Word, Excel, and Power Point. In order to create and submit your application to Grants.gov, applicants must use a computer with a previous version Microsoft Operating System, such as Windows XP.

If you attach a file created using MS Office 2007, you will not get an error message when you submit the application. **HOWEVER**, your entire application will not be able to be processed or accepted at Grants.gov and will not reach DOE. Grants.gov can accept applications with attachments created in MS Office 2007 if the attachments are saved in the format of a previous version. See the http://www.grants.gov/assets/Vista_and_office_07_Compatibility.pdf for detailed instructions on how to do this. A file created in MS Office 2007 can be identified by the "x" at the end of the file extension, for example "sample.docx" for a Word file. Contact Grants.gov at 1-800-518-4726 with any questions.

Contact Grants.gov at 1-800-518-4726 with any questions.

Questions: Questions relating to the registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov. Part VII of this announcement explains how to submit other questions to the U.S. Department of Energy (DOE).

Application Receipt Notices: After an application is submitted, the Authorized Organization Representative (AOR) will receive a series of five 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. When the AOR receives e-mail Number 5, it is their responsibility to follow the instructions in the e-mail to logon to IIPS and verify that their application was received by DOE. You will need the Submission Receipt Number (email Number 1) to track a submission. The titles of the five 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
- Number 5 – DOE e-Center Grant Application Received

The last email will contain instructions for the AOR to register with the DOE e-Center. If the AOR is already registered with the DOE e-Center, the title of the last email changes to:

- Number 5 – DOE e-Center Grant Application Received and Matched

This email will contain the direct link to the application in IIPS. The AOR will need to enter their DOE e-Center user id and password to access the application.

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PART I – FUNDING OPPORTUNITY DESCRIPTION

A. SUMMARY

The Department of Energy's Office of Science, Office of Basic Energy Sciences announces the initiation of Energy Frontier Research Centers (EFRCs) to accelerate the rate of scientific breakthroughs needed to create advanced energy technologies for the 21st century. The EFRCs will pursue the fundamental understanding necessary to meet the global need for abundant, clean, and economical energy.

B. STATUTORY AUTHORITY

Public Law 95-91, US Department of Energy Organization Act

Public Law 109-58, Energy Policy Act of 2005

C. APPLICABLE REGULATIONS

U.S. Department of Energy Financial Assistance Rules, codified at 10 CFR Part 600

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

D. BACKGROUND

Context. The 21st century brings with it staggering challenges for advanced energy technology. Limited supplies of traditional fossil energy resources and a clear consensus on the negative global effects of traditional fossil fuel utilization demand the discovery of transformative energy technologies for the development and effective utilization of new energy sources that are abundant, clean, and economical. Incremental advances in current energy technologies will not fully address the energy challenges of the 21st century. History has demonstrated that radically new technologies arise from disruptive advances at the frontiers of scientific thought. The incredible development of information technology of the 20th century provides the most recent example. What might a vision of 21st century energy technology look like? Imagine a virtually unlimited supply of electrical power from solar-energy systems, modeled on the photosynthetic processes utilized by green plants, and power lines that could transmit this electricity from the deserts of the southwest to the Eastern Seaboard at nearly 100 percent efficiency. This is but one of many visions of a new energy future that can only come from continuing to push the frontiers of science.

Establishing the Energy Research Directions. The Basic Energy Sciences (BES) program supports fundamental research in focused areas of the natural sciences in order to expand the scientific foundations for new and improved energy technologies and for understanding and mitigating the environmental impacts of energy use. BES has long invested in innovative basic research aimed to achieve this mission through its core research areas. 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 missions in energy efficiency, renewable energy resources, improved use of fossil fuels, safe and publicly acceptable nuclear energy, future energy sources, and reduced environmental impacts of energy production and use.

The scientific community responded to this BESAC study with enthusiasm through participation in a week-long workshop, whose results were published in early 2003 in the report, *Basic Research Needs to Assure a Secure Energy Future*. That report inspired a series of ten follow-on “*Basic Research Needs*” workshops over the next five years, which together attracted more than 1,500 participants from universities, industry, and DOE laboratories. The full reports from these 11 workshops can be found at: <http://www.sc.doe.gov/bes/reports/list.html> ; below are brief summaries that are intended only to convey a sense of the objectives and outcomes of each workshop.

Basic Research Needs To Assure A Secure Energy Future. This workshop assessed the basic research needs for energy technologies to assure a reliable, economic, and environmentally sound energy supply for the future. The results of the workshop are a compilation of 37 Proposed Research Directions. These fell into ten general research areas, all of which are multidisciplinary in nature: Materials Science to Transcend Energy Barriers, Energy Biosciences, Basic Research Towards the Hydrogen Economy, Innovative Energy Storage, Novel Membrane Assemblies, Heterogeneous Catalysis, Fundamental Approaches to Energy Conversion, Basic Research for Energy Utilization Efficiency, Actinide Chemistry and Nuclear Fuel Cycles, and Geosciences. Nanoscale science, theory, quantitative predictive modeling, and computational simulation were all identified as major cross-cutting areas.

Basic Research Needs for the Hydrogen Economy. The BES Workshop on Hydrogen Production, Storage, and Use examined the current state of the art in each of these areas, analyzed issues blocking rapid development of the hydrogen economy, and identified high-priority fundamental research directions to address these challenges. The essence of this report is captured in six cross-cutting research directions that were identified as being vital for enabling the dramatic breakthroughs to achieve lower costs, higher performance, and greater reliability that are needed for a competitive hydrogen economy: catalysis; nanostructured materials; membranes and separations; characterization and measurement techniques; theory, modeling, and simulation; and safety and environmental issues.

Basic Research Needs for Solar Energy Utilization. Sunlight is a compelling solution to the need for clean and abundant sources of energy in a world where demand for energy is projected to more than double by 2050 and to more than triple by the end of the century. However, there is a huge gap between our present use of solar energy and its enormous undeveloped potential. This defines a grand challenge in energy research. In response to that challenge, this workshop identified the key scientific problems and research directions that will enable efficient and economic use of the solar resource to provide a significant fraction of global primary energy by the mid 21st century. Solar energy conversion systems fall into three categories according to their primary energy product: solar electricity, solar fuels, and solar thermal systems. Although large technological barriers lay between the present and this mid-21st century primary energy goal, the workshop identified 13 priority research directions with high potential for producing scientific breakthroughs, ones that could dramatically advance solar energy conversion to electricity, fuels, and thermal power.

Basic Research Needs for Superconductivity. The challenge facing the electricity grid to provide abundant, reliable power will soon grow to crisis proportions. Revolutionary new power transmission and control solutions based on superconductors can solve this by increasing the grid’s capacity, efficiency, stability and reliability as they are uniquely capable of carrying current without loss, mediating overcurrents intrinsically while providing instantaneous power regulation. However, advancing the state-of-the-art in superconductivity presents a formidable research challenge, as its nature is one of fundamental science puzzles in a profusion of intriguing effects. A central challenge

with the biggest impact is the need to understand the fundamental mechanisms of high-temperature superconductivity. Another primary scientific opportunity is rooted in nanoscale phenomenon as superconductivity's two composite building blocks have dimensions ranging from a tenth of a nanometer to a hundred nanometers.

Basic Research Needs for Solid-State Lighting. Solid state lighting (SSL) modalities present an opportunity to achieve tremendous savings in energy efficiency. However, to achieve this, there are broad areas of discovery research and scientific inquiry required to lay the groundwork for the future of SSL, condensed in the following two primary challenges. One broad research challenge aims to change the very paradigm by which SSL structures are designed, moving from serendipitous discovery towards rational design. The other challenge aims to understand and control the microscopic pathways through which losses occur as electrons produce light, which is identified as a primary roadblock to SSL. By discovering and controlling the materials and nanostructure properties that mediate the competing conversion of electrons to light and heat, the challenge of converting every injected electron into useful photons will be addressed. The anticipated results are ultra-high-efficiency light-emitting materials and nanostructures, and a deep scientific understanding of how light interacts with matter, with broad impact on science and technology areas beyond SSL.

Basic Research Needs for Advanced Nuclear Energy Systems. The workshop identified new, emerging, and scientifically challenging areas in materials and chemical sciences that have the potential for significant impact on advanced nuclear energy systems. The performance of materials and chemical processes under extreme conditions of radiation fields and temperature must be improved. The fundamental challenge is to understand and control chemical and physical phenomena in multi-component systems from femto-seconds to millennia, at temperatures to 1000 °C, and under high radiation doses. The workshop identified nine priority research directions and three cross-cutting themes. Nanoscale characterization methods are needed to design materials with radiation, temperature, and corrosion resistance. First-principles approaches are needed to describe *5f*-electron (actinide) systems, to design molecules for separations, and to explain failure mechanisms of materials. Dynamical measurements are required to understand fundamental physical and chemical phenomena, especially at interfaces, in multi-component systems, and at the nanoscale and mesoscale in solution. New multiscale approaches are needed to integrate this knowledge into accurate models of relevant phenomena and complex systems across multiple length and time scales. These themes defined a science-based approach to the development of materials and chemical processes for advanced nuclear energy systems.

Basic Research Needs for Clean and Efficient Combustion of 21st Century Transportation Fuels. This workshop was charged with exploring basic research needs in the areas of gas-phase chemistry, combustion diagnostics, and combustion simulation that will enable the use of transportation fuels derived from non-traditional sources (oil shale, tar sands, coal, biomass) in a manner that optimizes engine efficiency and minimizes pollutant formation. Eight priority research directions were identified, two of which were devoted to a focus on engines or fuels and were similar in their strategy of working backward from technology drivers to scientific research needs. A third panel explored crosscutting science themes and identified critical gaps in our scientific understanding of 21st-century fuel combustion. The workshop identified a single, overarching grand challenge: *The development of a validated, predictive, multi-scale, combustion modeling capability to optimize the design and operation of evolving fuels in advanced engines for transportation applications.* The workshop produced a keen sense of urgency and opportunity for the development of revolutionary combustion technology for transportation based upon fundamental combustion science.

Basic Research Needs for Geosciences: Facilitating 21st Century Energy Systems. This report describes the scientific challenges associated with underground storage options for carbon dioxide and radioactive waste. New information is needed on the properties and processes associated with complex and heterogeneous subsurface mineral assemblages comprising porous rock formations, and the equally complex fluids that may reside within and flow through those formations. The relevant physical and chemical interactions occur on spatial scales that range from those of atoms, molecules, and mineral surfaces, up to tens of kilometers, and time scales that range from picoseconds to millennia. To predict with confidence the transport and fate of either CO₂ or the various components of stored nuclear materials, we need to better understand fundamental atomic, molecular, and biological processes that help determine the macroscopic properties of materials and fluids. We also need fundamental advances in the ability to simulate multi-scale systems as they are perturbed during sequestration activities and for very long times afterward, and to monitor those systems in real time with increasing spatial and temporal resolution. The ultimate objective is to predict accurately the performance of the subsurface fluid-rock storage systems, and to verify enough of the predicted performance with direct observations to build confidence that the systems will meet their design targets as well as environmental protection goals.

Basic Research Needs for Electrical Energy Storage. Dramatic improvements in electrical energy storage (EES) systems are required for the effective use of intermittent, renewable energy sources and to progress from today's hybrid electric vehicles to plug-in hybrids or all-electric vehicles. Vastly improved EES systems will be realized only with fundamental research to understand the underlying processes involved in EES. The fundamental performance limitations of energy storage systems are rooted in the constituent materials making up an EES device, and novel approaches are needed to develop multifunctional EES materials that offer new self-healing, self-regulating, failure-tolerant, impurity-sequestering, and sustainable characteristics. New capabilities are also needed to "observe" the dynamic composition and structure at an electrode surface, in real time, during charge transport and transfer processes. New in situ photon- and particle-based microscopic, spectroscopic and scattering techniques with time resolution down to the femtosecond range and spatial resolution spanning the atomic and mesoscopic scales are needed to meet this challenge. Research to formulate a predictive knowledge of structural and functional relationships based upon multiscale integrating theory-based methods at different time and length scales can effectively complement experimental efforts to provide insight into mechanisms, predict trends and identify new materials.

Basic Research Needs for Materials under Extreme Environments. Future energy technologies will place increasing demands on materials performance with respect to extremes in stress, strain, temperature, pressure, chemical reactivity, photon or radiation flux, and electric or magnetic fields. Reaching the intrinsic limit of materials performance is a key challenge, but solutions to this challenge require new understanding regarding the most fundamental atomic and molecular origins of material failure. This knowledge will only be gained by innovative basic research to unlock the fundamentals of how extreme environments interact with materials and how these interactions can be controlled to reach the intrinsic limits of materials performance. Advances in characterization and computational tools have the potential to provide an unprecedented opportunity to elucidate the fundamental mechanisms of these interactions. Elucidation of these mechanisms would allow the complex pathways of damage evolution from the atomic to the macroscopic scale to be understood.

Basic Research Needs: Catalysis for Energy . The workshop examined basic research needs to maximize the potential for new catalytic discoveries in three specific areas according to source: bio-derived chemicals, heavy fossil-derived chemicals, and end-product (such as carbon dioxide and

water) reconversion. The grand challenge identified at the core of all of these areas was to achieve detailed mechanistic understanding of catalytic dynamics for complex heavy molecular mixtures, bio-derived species, and solid nanostructures and interfaces. Such understanding would allow scientists to build effective catalysts with atom-by-atom precision and convert complex reactants to energy-storing products with molecular precision. Resolving this challenge requires scientific research to: create new and expanded fundamental theories of chemical kinetics that can effectively account for the dynamics and statistical fluctuations of structurally complex and diverse feedstocks; create and advance instrumentation that permit real-time high-resolution chemical imaging of reacting species and catalysts; and synthesize new and more complex catalyst structures that exploit multifunctionality and versatility to guide reactions through highly selective pathways.

The New Era of Science. Together, these workshop reports highlighted the remarkable scientific journey that has taken place during the past few decades. The resulting scientific challenges, which no longer were discussed in terms of traditional scientific disciplines, described a new era of science – an era in which materials functionalities are designed to specifications and chemical transformations are manipulated at will. Over and over, the recommendations from the workshops described similar themes – that in this new era of science, we would design, discover, and synthesize new materials and molecular assemblies through atomic scale control; probe and control photon, phonon, electron, and ion interactions with matter; perform multi-scale modeling that bridges the multiple length and time scales; and use the collective efforts of condensed matter and materials physicists, chemists, biologists, molecular engineers, and those skilled in applied mathematics and computer science.

The Science Grand Challenges: This goal to direct and control matter at the quantum, atomic, and molecular levels requires a change in our fundamental understanding of how nature works. A BESAC Grand Challenges subcommittee was convened, which examined the primary roadblocks to progress. The results of that examination were presented in the report, *Directing Matter and Energy: Five Challenges for Science and the Imagination*, where a new era for energy science was posed in five challenges:

- How do we control material processes at the level of electrons?

Much of the last century has focused on understanding how electrons in matter – their charge, their spin, and their dynamics – determine the properties of materials and how they direct chemical, electrical, or physical processes in materials. We are now on the verge of a new science of quantum control where our tools will go beyond probing what is there, towards the goal of controlling these processes and properties through direct manipulation of the electrons.

- How do we design and perfect atom- and energy-efficient synthesis of revolutionary new forms of matter with tailored properties?

The periodic table contains more than 110 elements, but only a tiny fraction of all possible chemical compounds has yet been prepared and their properties characterized. In the 21st Century, advances in theoretical understanding and computational power and methodology might turn the design rules for materials upside down. At present, we have little understanding of what it will take to achieve this. Beginning with a set of desired materials properties, the specific type of atoms and their arrangement needed to achieve the desired target materials will be defined in the computer. With this as a guidepost, the materials designer can set about to bring truly extraordinary materials to a tangible reality.

- How do remarkable properties of matter emerge from complex correlations of the atomic or electronic constituents and how can we control these properties?

Uncovering the fundamental rules of correlations and emergence and achieving control over those correlations are prospects that can only now be reasonably contemplated with the advent of tools to probe and affect particles and their correlations on the nanoscale. By understanding and controlling correlations, we can put emergence to work for us. The potential applications are as rich as the variety of emergent phenomena.

- How can we master energy and information on the nanoscale to create new technologies with capabilities rivaling those of living things?

Implementation and utilization of complex nanotechnologies with capabilities approaching those found within the biological world is quite beyond reach at present. Much functionality of living systems exceed those of most comparable human engineered technologies by so great a margin that, if it were not for the a priori existence of life, they might be inconceivable. However, living systems do exist; life thus provides the proof-of-concept for what can physically be achieved with nanotechnology. The ways in which energy, entropy, and information are manipulated within living nanosystems provide us with lessons on what we must learn to do in order to develop similarly sophisticated technologies.

- How do we characterize and control matter away – especially very far away – from equilibrium?

When systems are not at equilibrium, some of the most powerful science that we have, from thermodynamics to statistical mechanics, can become almost useless. This raises practical problems from how efficient a biological motor can be to how stable a glass is. But it also raises a fundamental challenge: how do we characterize and understand matter and information systems away (especially very far away) from equilibrium? These problems arise across natural and synthetic systems, and our understanding of them is still very rudimentary.

Addressing these grand challenges provides a path forward to the transition from observation to control of matter.

E. PURPOSE AND OBJECTIVES

Energy Frontier Research Centers

To implement the collective scientific recommendations of these 12 reports and to stimulate frontier energy research in a new era of science, the Office of Basic Energy Sciences is seeking applications for the establishment of Energy Frontier Research Centers (EFRCs). EFRCs will bring together the skills and talents of multiple investigators to enable fundamental research of a scope and complexity that would not be possible with the standard individual investigator or small group research project. As such, the EFRCs will strengthen and complement the existing portfolio of the single Principal Investigator and small group research projects currently supported within BES core research areas. The EFRC awards are expected to be in the \$2–5 million range annually for an initial five-year project period. It is anticipated that approximately \$100 million will be available annually for multiple EFRC awards starting in FY 2009.

F. DEFINITIONS

DOE/NNSA National Laboratories: DOE/NNSA Laboratories are those defined by Section 2 of the Energy Policy Act of 2005 (EPAct 05).

EFRC Director: The EFRC Director is the lead Principal Investigator and must be employed by the lead institution. The EFRC Director will serve as the primary contact responsible for communications with the DOE Program Officer on behalf of all of the Principal Investigators in the EFRC. The EFRC Director and the DOE Program Officer may establish an agreement for informal technical discussion or information exchange among Principal Investigators and DOE staff.

Multiple EFRC Directors, or Co-EFRC Directors, may be named in an application to share the responsibilities as lead Principal Investigator. Each Co-EFRC Director must be employed by the lead institution.

Principal Investigator: A Principal Investigator is the individual(s) a research organization designates as having an appropriate level of authority and responsibility for the proper conduct of the research, including the appropriate use of funds and administrative requirements such as the submission of scientific progress reports to the agency. When an organization designates more than one Principal Investigator, it identifies them as individuals who share the authority and responsibility for leading and directing the research, intellectually and logistically. The sponsoring agency does not infer any distinction in scientific stature among multiple Principal Investigators.

Senior/Key Personnel: A senior/key person is any individual who contributes in a substantive, measurable way to the scientific/technical development or execution of the project whether or not a salary is proposed for this individual. This definition includes, but is not limited to, the EFRC Director and the Principal Investigator(s).

PART II – AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT

DOE may award either a field work authorization or a grant under this Funding Opportunity Announcement. A DOE field work authorization will be awarded to a successful DOE/NNSA National Laboratory contractor. A grant will be awarded to any other successful domestic entity including, but not limited to, universities, nonprofit organizations, and for-profit organizations.

B. ESTIMATED FUNDING

Annual funding in the amount of \$100,000,000.00, or \$500,000,000.00 for the five-year project period, is expected to be available for new awards issued under this announcement. Up to \$25,000,000.00 is expected to be available for a five-year project period for each of the new awards issued under this announcement. The actual level of funding, if any, depends on the appropriations for this program.

C. MAXIMUM AND MINIMUM AWARD SIZE

- Ceiling (i.e., the maximum amount for an individual award made under this announcement): DOE anticipates the maximum value of individual awards to be \$5,000,000.00 annually or \$25,000,000.00 for a five-year project period.
- Floor (i.e., the minimum amount for an individual award made under this announcement): DOE anticipates the minimum value of individual awards to be \$2,000,000.00 annually or \$10,000,000.00 for the five-year project period.

D. EXPECTED NUMBER OF AWARDS

DOE anticipates making between 20 to 50 awards under this announcement depending on the value of the individual awards.

E. ANTICIPATED AWARD SIZE

DOE anticipates that a single award will be in the \$10,000,000.00 to \$25,000,000.00 range for the total five-year project period.

F. PERIOD OF PERFORMANCE

Awards are anticipated to be made for up to five years for each award.

G. TYPE OF APPLICATION

DOE will accept new applications under this announcement.

PART III - ELIGIBILITY INFORMATION

A. ELIGIBLE APPLICANTS

All types of domestic entities, including DOE/NNSA National Laboratory contractors, are eligible to apply as prime awardees. Eligible entities are defined in Section 989 of EAct 2005. In accordance with Section 989 of EAct 2005, this competition is not open to other Federal agencies and their Federally Funded Research and Development Center (FFRDC) contractors. 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.

B. COST SHARING

Cost sharing is not required.

C. OTHER ELIGIBILITY REQUIREMENTS

Team Arrangements

Entities proposing as a team must designate a lead organization. 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. **The designated lead organization, i.e., the prime applicant, must perform a greater percentage of the effort than any individual team member or subawardee. If an application is received whereby the prime applicant is not performing a greater percentage of the effort than one or more individual team members or subawardees, the application will be deemed non-responsive and rejected without further review.**

Eligible/Ineligible Entities

With the exception of foreign entities, the definition of Eligible Applicants set forth above in Part III, Section A. applies to all parties involved in an application, including the lead organization that actually submits the application (prime applicant) and all other institutions involved in any way in the proposed EFRC (team members and/or subcontractors). Foreign entities may not be the lead applicant, but may be proposed as a team member and/or subcontractor. In accordance with Section 989 of EAct 2005, DOE/NNSA National Laboratory contractors are the only types of FFRDC contractors eligible to participate. **Except for the provision of vendor materials, supplies, equipment, space, and scientific and technical advisory services, non-DOE/NNSA Federal agencies and their FFRDC contractors may not be included in applications as participants at any level, including unfunded scientific collaborators.**

Additionally, nonprofit organizations described in section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995, may not be the lead applicant, team members, and/or subcontractors; nor be involved in any way in the application.

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 subcontractor, or as an

unfunded contributor to the project, the application will be deemed non-responsive and rejected without further review. Note, however, that **non-DOE/NNSA Federal agencies and their FFRDC contractors** are not precluded from serving as vendors of materials, supplies, equipment, **space** 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. **In the event that a non-DOE/NNSA Federal agency and/or their FFRDC contractor will serve as a vendor of materials, supplies, equipment, space and/or scientific and technical advisory services to a proposed EFRC, the applicant must submit evidence of the non-DOE/NNSA Federal agencies authority and agreement to provide said items to DOE with the initial application. If an application is received that fails to include the non-DOE/NNSA Federal agencies authority and agreement to serve as a vendor, the application will be deemed non-responsive and rejected without further review**

In the event that other Federal agencies and/or their FFRDC contractors provide materials, supplies, equipment, **space** or scientific and technical advisory services, DOE **may** fund such entities through an interagency agreement under the Economy Act.

DOE/NNSA National Laboratory Contractors

DOE/NNSA National Laboratory applicants are eligible to apply for funding under this announcement if their cognizant 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. 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 and performed under the laboratory's Management and Operating (M&O) contract. 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 complimentary to the missions of the laboratory and will not adversely impact execution of the DOE/NNSA assigned programs at the laboratory.”

Applications that do not include the required cognizant Contracting Officer written authorization as specified above will be deemed non-responsive and rejected without further review.

Value/Funding: If a DOE/NNSA National Laboratory contractor is proposed as the prime awardee, DOE will directly fund the DOE/NNSA National Laboratory contractor through the DOE field work authorization system. If a DOE/NNSA FFRDC contractor is proposed as a team member for a DOE/NNSA National Laboratory prime awardee, DOE/NNSA will directly fund each DOE/NNSA FFRDC contractor portion of the work individually through the DOE field work authorization system. If the DOE/NNSA FFRDC contractor is proposed as a team member for a non- FFRDC awardee, the value of, and funding for the DOE/NNSA FFRDC contractor portion of the work will not be included in the award to a successful applicant, but will be funded directly to the DOE/NNSA FFRDC contractor through the DOE field work authorization system.

DOE/NNSA FFRDC Subcontractor Effort: The percentage of effort to be performed by the DOE/NNSA FFRDC subawardee may not be more significant than the percentage of effort to be performed by the prime applicant. **Any application received, where a DOE/NNSA FFRDC subawardee is performing a greater percentage of effort than the prime applicant, will be deemed non-responsive and rejected without further review.**

Responsibility: The applicant, if successful, will be the responsible authority regarding the settlement and satisfaction of all contractual and administrative issues, including but not limited to, disputes and claims arising out of any agreement between the applicant and the DOE/NNSA FFRDC contractor if the latter is a team member. 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 with DOE.

Limitation on Number of Lead Applications

A specific entity may not submit more than three applications as the prime applicant. If more than three applications are received from a prime applicant, DOE will consider the three applications initially received based on the Grants.gov date and time stamp. 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 participates as a team member/subcontractor.

Limitation on Number of Applications Submitted by an EFRC Director

The EFRC Director is the lead Principal Investigator and must be employed by the lead institution. An individual may not be named as the EFRC Director and/or Co-EFRC Director on more than one application. If the proposed EFRC Director or Co-EFRC Director will not be employed by the lead institution, 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 or Co-EFRC Director, DOE will consider the initial application received based on the Grants.gov date and time stamp. The remaining applications will be deemed non-responsive and rejected without further review. However, there is no restriction on the number of applications an individual may submit as a Principal Investigator.

Limitation on Amount of DOE Funds Requested

The maximum amount of funds DOE will provide for individual awards is \$5,000,000.00 annually or \$25,000,000.00 for the five-year project period. Applications requesting DOE support in an amount exceeding the stated maximums will be deemed non-responsive and will be rejected without further review.

PART 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 Catalog of Federal Domestic Assistance (CFDA) and/or the funding opportunity number located on the cover of this announcement and then follow the prompts to download the application package.

B. LETTER OF INTENT AND PRE-APPLICATION

1. Letter of Intent

Applicants are requested to submit a letter of intent by close of business Tuesday, July 1, 2008. This letter is to include a cover sheet containing the name and mailing address of the applicant lead institution, the planned title of the EFRC, the estimate of the total cost of the project over the five-year project period and/or an estimate of the cost in each year of the project, the name and e-mail address of the EFRC Director and Principal Investigator(s), and a listing of the institutions that are expected to be involved in the planned application in addition to the lead institution submitting the letter of intent, and a five to six page narrative containing the following:

- An overview of the strategic plan, including the long term vision and goals for the proposed EFRC as well as the objectives for the initial five-year period of the project; and
- An overview of the research plan.

The submission of letters of intent is very strongly encouraged as they will be used to organize and expedite the merit review process. However, failure to submit such letters will not negatively affect a responsive application submitted in a timely fashion. The application limitations set forth in Part III, Section C also apply to the letters of intent: no more than three may be submitted from a specific entity and an individual may be listed as EFRC Director on only one letter of intent. Letters of intent should be sent by E-mail to: efrc@science.doe.gov.

2. Pre-application

Pre-applications are not required.

3. Funding Opportunity Announcement Conference

A conference will not be held for this funding opportunity announcement.

C. CONTENT AND FORM OF APPLICATION – 424 (R&R)

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.**

1. SF 424 (R&R) Application for Federal Assistance 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. To activate the instructions, turn on the “Help Mode” (Icon with the pointer and question mark at the top of the form). The list of certifications and assurances referenced in Field 18 can be found on the DOE Financial Assistance Forms Page at http://management.energy.gov/business_doe/business_forms.htm under Certification and Assurances.

2. RESEARCH AND RELATED (R&R) Other Project Information

Complete questions 1 through 5 and attach files. The files must comply with the following instructions:

Project Summary/Abstract (Field 6 on the Form)

The project summary/abstract must contain a summary of the proposed activity suitable for dissemination to the public. It should be a self-contained document that identifies the name of the applicant, the EFRC Director, principal investigator(s), the project title, the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (i.e., benefits, outcomes), and, for collaborative projects, the dollar value of the effort to be performed by each participant over the five-year project period and a brief description of the capacity in which the participant will be participating. This document must not include any proprietary or sensitive business information as the Department may make it available to the public. The project summary must not exceed one 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.”

Project Narrative (Field 7 on the Form)

The project narrative must not exceed 50 pages, including charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard 8.5” by 11” paper with 1” margins (top, bottom, left, and right). **EVALUATORS WILL ONLY REVIEW THE NUMBER OF PAGES SPECIFIED IN THE PRECEDING SENTENCE.** A cover page and table of contents must be included at the beginning of the project narrative but neither will count against the page limit. Furthermore, information required to be submitted in the requested appendices are not subject to the project narrative page limit. Headers/footers containing page numbers and project titles/logos may be inserted within the required 1” margins. The font must not be smaller than Times New Roman 12 point. Do not include any Internet addresses (URLs) that provide information necessary to review the application, because the information contained in these sites will not be reviewed. See Part VIII.D for instructions on how to mark proprietary application information. To attach a Project Narrative, click “Add Attachment.”

The 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 are to include the following four components:

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

- How the research proposed for the EFRC is at the scientific forefront of one or more of the challenges described in the BESAC report *Directing Matter and Energy: Five Challenges for Science and the Imagination* (http://www.sc.doe.gov/bes/reports/files/GC_rpt.pdf);
- How the research proposed for the EFRC addresses one or more of the energy challenges described in the ten BES workshop reports in the *Basic Research Needs* series (<http://www.sc.doe.gov/bes/reports/list.html>);
- The strategy and plan for developing and operating the EFRC, including the need for a EFRC approach involving several senior/key personnel, the means of achieving an integrated EFRC, and plans for leadership and guidance for the scientific and technical direction;
- A comprehensive management plan for a world-leading program that encourages high-risk, high-reward research and encourages synergisms among investigators, thus demonstrating that the whole is substantially greater than the sum of the individual parts;
- 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 and approval of the research program;
- Relevant experience of lead institution and senior/key personnel in project, program, and personnel management for projects of comparable magnitude;
- Relevant experience of lead institution and EFRC Director in project, program, and personnel management of diverse teams of science and technical professionals;
- Major needs and recruiting strategy for additional scientific and technical personnel including new senior staff, students, and postdocs;
- A description of a program that provides opportunities to inspire, train, and support leading scientists of the future who have an appreciation for the global energy challenges of the 21st century, including specific plans for education, outreach, and training;
- How the EFRC leadership will communicate effectively with scientists of all disciplines and promote awareness of the importance of energy science and technology;
- Availability of the EFRC Director and senior/key personnel, including analysis of their potential involvement in other major projects;
- As appropriate for the research described in the application, the role of any advisory committee, executive committee, program committee, or their equivalent;
- A discussion of how the proposed research relates to existing and planned research programs at the host institution;
- **A brief overview of environmental, health, and safety practices and oversight at each participating institution;**
- If applicable, provide a list of Federal, Tribal, State, and local government permits, licenses, and approvals that must be obtained; and
- If the proposed research is organized into subtasks, the integration, synergy, and coordination among the proposed research elements;

II. Proposed Research Applicants must provide detailed information regarding the research proposed for the EFRC. This section, which may be organized in the subtasks,

must **clearly describe the proposed research and:**

- Briefly sketch the background leading to the application, critically evaluate existing knowledge, and specifically identify the gaps that the project is intended to fill;
- State concisely the importance of the research described in the application;
- Explain the relevance of the proposed research to the needs and opportunities identified in BESAC report *Directing Matter and Energy: Five Challenges for Science and the Imagination* and one or more of the *Basic Research Needs* reports;
- Describe a balanced and comprehensive program of basic research that, as needed, supports experimental, theoretical, and computational efforts and develops new approaches in these areas;
- State the proposed approach to reconfigure research thrusts to respond to key scientific challenges and promising developments;
- Delineate plans for external collaborations and partnerships including utilization of DOE user facilities, if applicable;
- Discuss how the proposed research relates to the core research activities within the BES Materials Sciences and Engineering and Chemical Sciences, Geosciences and Biosciences Divisions (<http://www.sc.doe.gov/bes/brochures/CRA.html>);
- Describe the role and intellectual contribution of the EFRC Director, each Principal Investigator, and each senior/key person in the application;
- Enumerate the relevant scientific and technical expertise and experience in the research disciplines needed for project success for senior/key personnel in the application;
- Briefly outline the resources available to the proposed EFRC including access to existing research space, instrumentation and facilities at the host institutions and its partner;
- Describe access to research capabilities and resources, including experimental and computational capabilities, both within the EFRC and external to the EFRC;
- Address environmental, safety, and health issues associated with the proposed research; and
- (Optional) Provide an account of any preliminary studies that may be pertinent to the proposed research. Include any other information that will help to establish the experience and competence of the investigators to pursue the proposed project.

III. Project Performance Site

Indicate the primary site where the work will be performed. If a portion of the work will be performed at any other sites, identify those sites, also.

IV. BES PART Goals

Each application must contain one paragraph addressing how the proposed research will address one or more of the four BES long-term program measures used by the Office of Management and Budget to rate the BES program annually; these measures may be found at http://www.science.doe.gov/bes/BES_PART_Performance_Measures.pdf .

- **Appendix 1: Biographical Sketch**

Provide a biographical sketch for the EFRC Director, Principal Investigator(s) and each 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 teaming partners is allowed. The biographical information for each person must not exceed three pages when printed on 8.5” by 11” paper with 1” margins (top, bottom, left, and right) with font not smaller than Times New Roman 12 point. Please provide this information as an appendix to your project narrative. **Do not attach a separate file. The biographical sketch appendix will not count in the project narrative page limitation.** Include:

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

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

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

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

Synergistic Activities: List no more than 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, including their current organizational affiliation, who are, or who have been, collaborators or co-authors with you on a research project, book or book article, report, abstract, or paper during the 48 months preceding the submission of this application. Also, list any individuals who are currently or have been, co-editors with you on a special issue of a journal, compendium, or conference proceedings during the 24 months preceding submission of this application. If there are no collaborators or co-editors to report, state “None.”.

Graduate and Postdoctoral Advisors and Advisees: List the names and current organizational affiliations of your graduate advisor(s) and principal postdoctoral sponsor(s) during the last five years. Also, list the names and current organizational affiliations of your graduate students and postdoctoral associates during the last five years.

EFRC Director Statement of Employment: For the EFRC Director or Co-EFRC Director(s), submit documentation stating that the proposed EFRC Director or Co-EFRC Director is an employee of the prime applicant. 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 each senior/key person, **including the EFRC Director(s) and Principal Investigator(s)**, provide a signed commitment 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).

- **Appendix 2: Current and Pending Support**

Provide a list of all current and pending support (both Federal and non-Federal) for the EFRC Director, Principal Investigator(s) and senior/key persons, including subawardees and consultants, for ongoing projects and pending applications as an appendix to the project narrative. For each organization providing support, show the total award amount for the entire award period (including indirect costs) and the number of person-months per year to be devoted to the project by the senior/key person. Concurrent submission of an application to other organizations for simultaneous consideration will not prejudice its review. **Do not attach a separate file. The current and pending support 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. Please provide this information as an appendix to your 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. 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. In order to reduce the number of files attached to your application, please provide the Bibliography and References Cited information as an appendix to your project narrative. **Do not attach a file in field 8. This appendix will not count in the project narrative page limitation.**

- **Appendix 4: Facilities & 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. 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. In order to reduce the number of files attached to your application, please provide the Facility and Other Resource information as an appendix to your project narrative. **Do not attach a file in field 9. This appendix will not count in the project narrative page limitation.**

- **Appendix 5: Equipment**

List major items of equipment already available for this project and, if appropriate, identify location and pertinent capabilities. In order to reduce the number of files attached to your application, please provide the Equipment information as an appendix to your project narrative. **Do not attach a file in field 10. This appendix will not count in the project narrative page limitation.**

- **Appendix 6: Cost Sharing**

Although cost sharing is not required, if you are proposing cost sharing as part of your response to the funding opportunity announcement, you must include a **separate budget form or spreadsheet itemizing the proposed cost share for each year of the proposed project period utilizing the categories listed in the Research and Related Budget form. In addition, you must include a letter from each third party contributing to cost sharing (i.e., a party other than the organization submitting the application) at the time you submit your application. The letter must state that the third party is committed to providing a specific single dollar amount of cost sharing together with the percentage of your proposed project costs your cost sharing commitment represents. By submitting your application, you are providing assurance that you have signed letters of commitment. If cost sharing is proposed, you must provide the requested budget forms or spreadsheets, a budget justification for the categories of costs to be shared, and an explanation of the source, nature, amount, and availability of any proposed cost sharing. For each third party contributing to cost sharing, identify: (1) the name of the organization; (2) the proposed dollar amount to be provided; (3) the amount as a percentage of the total project cost; and (4) the proposed cost sharing – cash, services, or property. Please provide this information as an appendix to your project narrative. Do not attach a separate file. This appendix will not count in the project narrative page limitation.**

- **Appendix 7: 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 applicants, 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. **Do not attach a separate file. This appendix will not count in the project narrative page limitation.**

- **Appendix 8: Coordination Plan**

If multiple Principal Investigators will be designated, provide a Coordination and Management Plan that describes the organizations structure of the project as it pertains to

the designations of multiple Principal Investigators. This plan, at a minimum, must describe the process for making decisions on scientific/technical direction, publications, and intellectual property issues. The plan must also describe Principal Investigators' roles and administrative, technical, and scientific responsibilities for the project; communication plans; and procedures for resolving conflicts. **This plan is separate and distinct from the EFRC Management Plan required in the Project Narrative and may not substitute for it. Do not attach a separate file. This appendix will not count in the project narrative page limitation.**

- **Appendix 9: Organizational Letters of Commitment**

A single organizational letter of commitment is required from each organization participating as a team member. Each letter of commitment from an organization participating as a team member must be signed by the person authorized to commit the organization to a legally binding agreement. Each organizational letter of commitment is limited to one page. **Do not attach a separate file. This appendix will not count in the project narrative page limitation.**

- **Appendix 10: Other Attachments**

If you need to elaborate on your responses to questions 1-5 on the "Other Project Information" document, please provide this information as an appendix to your project narrative. **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 8, 9, 10, and 11, instead follow the above instructions to include the information as appendices to the project narrative file (these appendices will not count in the project narrative page limitation).

Also, attach the following files:

Budget for DOE/NNSA National Laboratory Contractor, if applicable.

If a DOE/NNSA National Laboratory contractor is to perform any portion of the work, you 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 <http://www.management.energy.gov/documents/o4121.pdf>. 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 Contracting Officer approval authorizing the participation of the DOE/NNSA National Laboratory as described in Part III.C. 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 (plus.pdf) as

the file name and attach to the R&R Other Project Information form in Field 11 – Add Attachments.

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 announcement (See PART IV. G).

Budget Justification (Field K on the form).

Provide the required supporting information for the following costs (See R&R instructions): equipment; domestic and foreign travel; participant/trainees; material 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. **If a non-DOE/NNSA Federal agency and/or their FFRDC contractor will serve as a vendor of materials, supplies, equipment, space and/or scientific and technical advisory services to a proposed EFRC, submit evidence of the non-DOE/NNSA Federal agencies authority and agreement to provide said items to DOE as part of the budget justification file.** 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 FORM

Budgets for Subawardees. You must provide a separate cumulative R&R budget for each subawardee that is expected to perform work estimated to be more than \$100,000 or 50 percent of the total work effort (whichever is less). 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 as the file name.

5. Disclosure of Lobbying Activities (SF-LLL)

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

Summary of Required Forms/Files

Your application must include the following documents:

Name of Document	Format	Attach to
SF 424 (R&R)	Form	N/A
RESEARCH AND RELATED Other Project Information	Form	N/A
Project Summary/Abstract	PDF	Field 6
Project Narrative, including required appendices	PDF	Field 7
Budget for DOE/NNSA National Laboratory Contractor, if applicable	PDF	Field 11
RESEARCH AND RELATED BUDGET	Form	N/A
Budget Justification	PDF	Field K
R&R SUBAWARD BUDGET ATTACHMENT(S) FORM , if applicable	Form	N/A
SF-LLL Disclosure of Lobbying Activities , if applicable	Form	N/A

D. SUBMISSION FROM SUCCESSFUL APPLICANT

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
- Cost Sharing **Contributions**, if applicable
- Environmental Evaluation Notification Form, if applicable
- Conflict of Interest Management Plan

E. SUBMISSION DATES AND TIMES

1. Pre-application Due Date

Pre-applications are not required.

2. Application Due Date

Applications must be received by October 1, 2008, not later than 11:00 PM Eastern Time. You are encouraged to transmit your application well before the deadline.

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

F. INTERGOVERNMENTAL REVIEW

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

G. FUNDING RESTRICTIONS

Cost Principles. Costs must be allowable in accordance with the applicable Federal cost principles referenced in 10 CFR Part 600 or the Contract Cost Principles in FAR Part 31 and DEAR Parts 931 and 970.31.

Pre-award Costs. Recipients, other than DOE/NNSA National Laboratory contractors, may charge pre-award costs to an award resulting from this announcement that were incurred within the ninety (90) calendar day period immediately preceding the effective date of the award, if the costs are allowable in accordance with the applicable Federal cost principles referenced in 10 CFR Part 600. Recipients must obtain the approval of the Contracting Officer for any pre-award costs that are for periods greater than this 90-day calendar period prior to incurrence of such costs.

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

H. OTHER SUBMISSION AND REGISTRATION REQUIREMENTS

1. Where to Submit

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

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

2. Registration Process

You must COMPLETE the one-time registration process (all steps) before you can submit your first application through Grants.gov (See www.grants.gov/GetStarted). **We recommend that you start this process at least three weeks before the**

application due date. It may take 21 days or more to complete the entire process. Use the Grants.gov Organizational Registration Checklists at <http://www.grants.gov/assets/OrganizationRegCheck.pdf> to guide you through the process. **IMPORTANT: During the CCR 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 a “Marketing Partner identification Number” (MPIN). When you have completed the process, you must 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 five 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. When the AOR receives email Number 5, it is their responsibility to follow the instructions in the email to logon to IIPS and verify that their application was received by DOE. You will need the Submission Receipt Number (email Number 1) to track a submission. The titles of the five 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

Number 5 – DOE e-Center Grant Application Received

The last email will contain instructions for the AOR to register with the DOE e-Center. If the AOR is already registered with the DOE e-Center, the title of the last email changes to:

Number 5 – DOE e-Center Grant Application Received and Matched

This email will contain the direct link to the application in IIPS. The AOR will need to enter their DOE e-Center user id and password to access the application.

PART 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 announcement has been submitted; (3) all mandatory requirements are satisfied; and (4) the proposed project is responsive to the objectives of the funding opportunity announcement. In particular, to be responsive to the objectives of the funding opportunity announcement, the research proposed in the EFRC application must: (1) address one or more of the challenges described in the BESAC report *Directing Matter and Energy: Five Challenges for Science and the Imagination* (http://www.sc.doe.gov/bes/reports/files/GC_rpt.pdf), and (2) address one or more of the energy challenges described in the 10 BES workshop reports in the *Basic Research Needs* series (<http://www.sc.doe.gov/bes/reports/list.html>).

2. Merit Review Criteria

Applications will be evaluated by one or more Merit Review Panels. The broad range of science encompassed by the funding opportunity announcement and the potentially large number of applications require the use of multiple Merit Review Panels. All Merit Review Panels will review applications using identical criteria; these are listed below. Following completion of the merit review, a team comprised of Federal officials will review the applications and the evaluations of the Merit Review Panels, summarize the Merit Review Panels' independent evaluations of, and recommendations regarding, the applications submitted, and recommend the application of the program policy factors, as appropriate.

Applications will be subjected to formal merit review and will be evaluated against the following four criteria, which are listed in descending order of importance as set forth in 10 CFR Part 605.10(d) (<http://www.science.doe.gov/grants/605index.html>). Included within each criterion are the detailed questions that reviewers will consider in evaluating each criterion.

a. Scientific and/or technical merit of the project

- Does the research proposed for the EFRC lie at the scientific forefront of one or more of the challenges described in the BESAC report *Directing Matter and Energy: Five Challenges for Science and the Imagination* (http://www.sc.doe.gov/bes/reports/files/GC_rpt.pdf)?
- Does the research proposed for the EFRC address one or more of the energy challenges described in the ten BES workshop reports in the *Basic Research Needs* series (<http://www.sc.doe.gov/bes/reports/list.html>) in an effective and impactful manner?
- Does the application present a balanced and comprehensive program of basic research that, as needed, supports experimental, theoretical, and computational efforts and develops new approaches in these areas?

- What is the likelihood that the applicant can overcome key scientific challenges and shift research directions in response to promising developments?
- Are the elements of the proposed research appropriately integrated, coordinated, and synergistic?

b. 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 applicant present a comprehensive management plan for a world-leading program that encourages high-risk, high-reward research and encourages synergisms among investigators, thus demonstrating that the whole is substantially greater than the sum of the individual parts?
- 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 and approval of the research program?
- Are the applicant's plans (if any) for education, outreach and training in the proposed EFRC appropriate?
- Are the plans (if any) for external collaborations and partnerships reasonable and appropriate?
- Is the role (if any) of any advisory committee, executive committee, program committee, or their equivalent adequately described and appropriate?
- Are the roles and intellectual contributions of the EFRC Director, Principal Investigator(s), and each senior/key person adequately described and appropriate?
- How effectively does the proposed research relate to existing and planned research programs at the host institution?
- Are environment, safety and health issues responsibly anticipated and addressed?

c. Competency of the applicant's personnel and adequacy of the proposed resources

- Do the applicant's senior/key personnel have a proven record of research in the disciplines needed for success in this project?
- Is the proposed access to existing research space, instrumentation and facilities at the host institutions and its partners 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?
- Do the lead institution and the senior/key personnel for the EFRC have proven records of success in project, program, and personnel management for projects of comparable magnitude?
- Do the lead institution and the EFRC Director have proven records of success in project, program, and personnel management of diverse teams of science and technical professionals?
- Is the plan for recruiting any additional scientific and technical personnel including new senior staff, students and postdocs reasonable and appropriate?

- 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 fully available to the proposed EFRC, particularly taking into account their potential involvement in other major projects?
- Does each participating institution possess adequate systems for ensuring environmental, health and safety support and oversight?

d. Reasonableness and appropriateness of the proposed budget

- Is the requested budget for developing the proposed EFRC appropriate, including any costs of acquiring and preparing space for existing and new equipment and instrumentation?
- Is the requested operating budget for the proposed EFRC reasonable for the planned scientific program?
- Are the capital equipment needs adequately identified, and costs for needed new instrumentation or upgrades realistically estimated?
- Are all subcontracts, travel, student costs and other ancillary expenses adequately justified and estimated?

Other Selection Factors

The selection official will consider the following program policy and management factors in the selection process:

- 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;
- Relation of the proposed EFRCs to the core research activities within the BES Materials Sciences and Engineering and Chemical Sciences, Geosciences and Biosciences Divisions;
- Potential for developing synergies between the proposed EFRC and other EFRCs or other ongoing BES research activities; **and**
- Total amount of DOE funds available.

B. REVIEW AND SELECTION PROCESS

1. Merit Review

Applications that pass the initial review will be subjected to a formal merit review and will be evaluated based on the criteria codified at 10 CFR Part 605.10(d) as set forth in Part V.A.2. of this funding opportunity announcement. DOE may, as part of the merit review process, schedule face-to-face meetings between representatives of one or more applicants and members of one or more of the merit review panel(s) to allow merit review panel members to obtain answers to their questions or additional information about the contents of the most meritorious applications. Applicants may be required to travel to a designated location for a presentation to one or more of the merit review panels.

2. Selection

The Selection Official will consider the merit review recommendations, Federal officials' review, program policy and management factors, and the amount of funds available.

3. Discussions and Award

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

C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES

DOE anticipates notifying the applicants selected for awards in April 2009 and making awards in September 2009 or earlier.

PART VI - AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES

1. Notice of Selection

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

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

2. Notice of Award

If the selected applicant is an entity other than a DOE/NNSA National Laboratory contractor, a Notice of Financial Assistance Award issued by the Contracting Officer is the authorizing award document. It normally includes, either as an attachment or by reference: 1. Special Terms and Conditions; 2. Applicable program regulations, if any; 3. Application as approved by DOE; 4. DOE assistance regulations at 10 CFR Part 600, **and**, for Federal Demonstration Partnership (FDP) institutions, the FDP terms and conditions; 5. National Policy Assurances To Be Incorporated As Award Terms; 6. Budget Summary; and 7. Federal Assistance Reporting Checklist and Instructions, which identifies the reporting requirements.

If the selected applicant is a DOE/NNSA National Laboratory contractor, DOE will fund the DOE/NNSA National Laboratory contractor through the DOE field work authorization system.

DOE/NNSA FFRDC contractors participating as subcontractors will be funded directly by DOE through the DOE field work authorization system.

B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

1. Administrative Requirements

The administrative requirements for DOE grants and cooperative agreements are contained in 10 CFR Part 600 (See: <http://ecfr.gpoaccess.gov>), except for grants and cooperative agreements made to Federal Demonstration Partnership (FDP) institutions. The FDP terms and conditions and DOE FDP agency specific terms and conditions are located on the National Science Foundation web site at http://www.nsf.gov/awards/managing/fed_dem_part.jsp.

2. Special Terms and Conditions and National Policy Requirements

Special Terms and Conditions and National Policy Requirements

The DOE Special Terms and Conditions for Use in Most Grants and Cooperative Agreements are located at http://management.energy.gov/business_doe/business_forms.htm.

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

Intellectual Property Provisions

The standard DOE financial assistance intellectual property provisions applicable to the various types of recipients are located at http://www.gc.doe.gov/financial_assistance_awards.htm.

Awards to a DOE/NNSA National Laboratory will be subject to the intellectual property terms and conditions of the respective M&O contract.

DOE Subcontract Consent

DOE reserves the right to require the awardee to obtain written approval of the Contracting Officer prior to placement of any subcontract(s).

C. REPORTING

Reporting requirements are identified on the Federal Assistance Reporting Checklist and Instructions, DOE F 4600.2, attached to the award agreement. See the Office of Science Financial Assistance Program Page at <http://www.sc.doe.gov/grants> for information on reporting requirements that may be required if a grant is awarded. In addition, for informational purposes, DOE anticipates requiring at least quarterly reports for purposes of tracking schedule, costs, and performance to ensure implementation of appropriate project controls. However, DOE reserves the right to negotiate reporting requirements after selection but prior to award.

PART VII - QUESTIONS/AGENCY CONTACTS

A. QUESTIONS

Questions regarding the content of the announcement must be submitted through the “Submit Question” feature of the DOE Industry Interactive Procurement System (IIPS) at <http://e-center.doe.gov>. Locate the program announcement on IIPS and then click on the “Submit Question” button. Enter required information. You will receive an electronic notification that your question has been answered. DOE/NNSA will try to respond to a question within 3 business days, unless a similar question and answer have already been posted on the website.

Due to the time required to conduct research and provide complete and accurate answers to questions, DOE is requesting that all questions be submitted through IIPS no later than 12 noon Eastern Time on 08/15/08. DOE will not be responsible for responding to questions submitted after the designated time on 08/15/08.

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

B. AGENCY CONTACT

Name: Emiela M. Bradford
E-mail: emiela.bradford@ch.doe.gov
FAX: 630-252-5045
Telephone:630-252-6156

PART VIII - OTHER INFORMATION

A. MODIFICATIONS

Notices of any modifications to this announcement will be posted on Grants.gov and the DOE Industry Interactive Procurement System (IIPS). You can receive an email when a modification or an announcement message is posted by joining the mailing list for this announcement through the link in IIPS. When you download the application at Grants.gov, you can also register to receive notifications of changes through Grants.gov.

B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE

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

C. COMMITMENT OF PUBLIC FUNDS

The Contracting Officer is the only individual who can make awards or commit the Government to the expenditure of public funds. A commitment by other than the Contracting Officer, either explicit or implied, is invalid.

D. PROPRIETARY APPLICATION INFORMATION

Patentable ideas, trade secrets, proprietary or confidential commercial or financial information, disclosure of which may harm the applicant, must 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. 42 U.S.C. 5908 provides that title to such inventions vests in the United States, except where 35 U.S.C. 202 provides otherwise for nonprofit organizations or small business firms. However, the Secretary of Energy may waive all or any part of the rights of the United States subject to certain conditions. (See “Notice of Right to Request Patent Waiver” in paragraph G below.)

Rights in Technical Data. Normally, the government has unlimited rights in technical data created under a DOE agreement. Delivery or third party licensing of proprietary software or data developed solely at private expense will not normally be required except as specifically negotiated in a particular agreement to satisfy DOE’s own needs or to ensure the commercialization of technology developed under a DOE agreement.

G. NOTICE OF RIGHT TO REQUEST PATENT WAIVER

Applicants may request a waiver of all or any part of the rights of the United States in inventions conceived or first actually reduced to practice in performance of an agreement as a result of this announcement, in advance of or within 30 days after the effective date of the award. Even if such advance waiver is not requested or the request is denied, the recipient will have a continuing right under the award to request a waiver of the rights of the United States in identified inventions, i.e., individual inventions conceived or first actually reduced to practice in performance of the award. Any patent waiver that may be granted is subject to certain terms and conditions in 10 CFR 784.

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

H. NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES.

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

I. REAL PROPERTY

With respect to the use, management, and disposition of all real property, 10 CFR Part 600.132 shall be applicable to grants with institutions of higher education, hospitals, and other nonprofit organizations; 10 CFR Part 600.321 shall be applicable to grants with for-profit organizations; and it is anticipated that the terms and conditions of the respective management and operating contract shall apply to awards to DOE/NNSA FFRDC contractors.

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 its subawardees of any tier.

K. AVAILABILITY OF FUNDS

Funds are not presently available for this award. The Government's obligation under this award is contingent upon the availability of appropriated funds from which payment for award purposes can be made. 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.

APPENDICES/REFERENCE MATERIAL

Reference Material

Basic Research Needs to Assure a Secure Energy Future, DOE Office of Basic Energy Sciences Workshop Report, February, 2003; http://www.sc.doe.gov/bes/reports/files/SEF_rpt.pdf .

Basic Research Needs for the Hydrogen Economy, DOE Office of Basic Energy Sciences Workshop Report, May, 2003; http://www.sc.doe.gov/bes/reports/files/NHE_rpt.pdf .

Basic Research Needs for Solar Energy Utilization, DOE Office of Basic Energy Sciences Workshop Report, April, 2005; http://www.sc.doe.gov/bes/reports/files/SEU_rpt.pdf .

Basic Research Needs for Superconductivity, DOE Office of Basic Energy Sciences Workshop Report, May, 2006; http://www.sc.doe.gov/bes/reports/files/SC_rpt.pdf .

Basic Research Needs for Solid State Lighting, DOE Office of Basic Energy Sciences Workshop Report, May, 2006; http://www.sc.doe.gov/bes/reports/files/SSL_rpt.pdf .

Basic Research Needs for Advanced Nuclear Energy Systems, DOE Office of Basic Energy Sciences Workshop Report, August, 2006; http://www.sc.doe.gov/bes/reports/files/ANES_rpt.pdf .

Basic Research Needs for Clean and Efficient Combustion of 21st Century Transportation Fuels, DOE Office of Basic Energy Sciences Workshop Report, November, 2006; http://www.sc.doe.gov/bes/reports/files/CTF_rpt.pdf .

Basic Research Needs for Geosciences: Facilitating 21st Century Energy Systems, DOE Office of Basic Energy Sciences Workshop Report, February, 2007; http://www.sc.doe.gov/bes/reports/files/GEO_rpt.pdf .

Basic Research Needs for Electrical Energy Storage, DOE Office of Basic Energy Sciences Workshop Report, April, 2007; http://www.sc.doe.gov/bes/reports/files/EES_rpt.pdf .

Basic Research Needs for Materials Under Extreme Environments, DOE Office of Basic Energy Sciences Workshop Report, June, 2007; http://www.sc.doe.gov/bes/reports/files/MUEE_rpt.pdf .

Basic Research Needs: Catalysis for Energy, DOE Office of Basic Energy Sciences Workshop Report, August, 2006; http://www.sc.doe.gov/bes/reports/files/CAT_rpt.pdf .

Directing Matter and Energy: Five Grand Challenges for Science and the Imagination, DOE Office of Basic Energy Sciences Advisory Committee Report, December, 2007; http://www.sc.doe.gov/bes/reports/files/GC_rpt.pdf .