FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT

U. S. Department of Energy

Energy Innovation Hub – Fuels from Sunlight

Funding Opportunity Number: DE-FOA-0000214

Announcement Type: Amendment 000001

CFDA Number: 81.049 - Office of Science Financial Assistance Program

FOA Issue Date:	**12/22/2009**
Letter of Intent Due Date:	**01/29/2010**
Pre-Application Due Date:	**Not Applicable**
Application Due Date:	**03/29/2010 at 11:59 PM Eastern Time**

The purpose of this amendment is to:

1. In Section II.A, TYPE OF AWARD INSTRUMENT, in the second paragraph, the Tenth sentence is hereby deleted and is replaced with the following sentence: "If the DOE/NNSA FFRDC contractor is a part of a consortium or teaming arrangement, the value of, and funding for the DOE/NNSA FFRDC contractor portion of the work will be authorized and funded under the DOE field work authorization system and performed under the laboratory's Management and Operating (M&O) contract."

2. All other terms and conditions remain unchanged.

This Announcement will remain open until the Application Due Date indicated above however, applications may be submitted any time before this Announcement closes.

It is also recommended that application submission begin well in advance (at least 48 hours) of the Announcement closing.

NOTE: Applications in response to this FOA must be submitted through Grants.gov.

NOTE: REGISTRATION/SUBMISSION REQUIREMENTS

Registration Requirements

There are several one-time actions you must complete in order to submit an application in response to this Announcement: 1) obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number, 2) register with the Central Contractor Registration (CCR), 3) register with Grants.gov, and 4) register with FedConnect. If not previously registered, applicants should allow at least 10 business days to complete these requirements. It is suggested that the process be started as soon as possible.

Applicants must obtain a DUNS number. Instructions can be found at:

http://fedgov.dnb.com/webform

Applicants must register with the CCR. The CCR website is:

http://www.ccr.gov/

Applicants must register with Grants.gov to submit their application. The Grants.gov website is:

http://www.Grants.gov

Applicants must register with FedConnect. The FedConnect website is:

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

Questions

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

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

Questions pertaining to the FedConnect registration process should be directed by e-mail to support@FedConnect.net or by phone to FedConnect Support at 800-899-6665.

Application Preparation and Submission

Applicants must download the application package, application forms and instructions, from Grants.gov. **The Grants.gov website is:**

http://www.grants.gov/

Applicants must submit their application through Grants.gov. Additional instructions are provided in Section IV, A and I of this FOA.

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Section I - FUNDING OPPORTUNITY DESCRIPTION

A. SUMMARY

The Department of Energy will launch three Energy Innovation Hubs in FY2010—one in each of the focus areas listed below:

1. Fuels from Sunlight,
2. Energy Efficient Building Systems Design, and
3. Modeling and Simulation for Nuclear Reactors.

The Secretary of Energy has identified the problems in these topic areas as presenting the most critical barriers to achieving national energy and climate goals while having proven resistant to solution by conventional R&D enterprise structures. In a new R&D structure modeled on the Department's successful Bioenergy Research Centers, each Hub will comprise a highly collaborative team, spanning multiple scientific, engineering, and where appropriate, economics, and public-policy disciplines. By bringing together top talent across the full spectrum of R&D performers—including universities, private industry, non-profits, and National Laboratories—each Hub is expected to become a world-leading R&D center in its topical area.

The Hubs will seek to rapidly drive energy solutions to their fundamental limits. Each Hub will support cross-disciplinary R&D focused on the barriers to transforming its energy technologies into commercially deployable materials, devices, and systems. The ultimate goal of each will be to advance a highly promising area of energy science and technology to the point that the risk level will be low enough for industry to deploy solutions into the marketplace.

The Hubs will foster unique scientific collaboration that will be critical to success, and must be backed by a meaningful and sustained investment. The initial award period is for five years. Each Hub will be funded at a total of $22 million in FY 2010, with up to $10 million of those funds to be devoted to infrastructure start-up for the Hub, including building renovation (but no new construction), lease arrangements, equipment, and instrumentation. It is anticipated that each Hub established in FY 2010 will be funded at $25 million per year for Hub operations in the final four years (FY 2011 – FY 2014) of the initial award period, pending Congressional appropriations.

Funding will be competitively awarded to Hubs selected by Federal officials based on rigorous review procedures as detailed in Section V of this of Funding Opportunity Announcement (FOA). Hub progress and renewal requests will be monitored by an Oversight Board established by the Secretary, acting upon recommendations of DOE staff and external reviewers.

B. STATUTORY AUTHORITY

Public Law 95-91, U.S. Department of Energy Organization Act

Public Law 109-58, Energy Policy Act of 2005

Public Law 111-85, Energy and Water Development and Related Agencies Appropriations Act, 2010

C. APPLICABLE REGULATIONS

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

U.S. Department of Energy Technology Investment Agreement Rules, 10 CFR Part 603

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

D. BACKGROUND

The critical challenges that our Nation faces in the 21st Century to its energy, environmental, and economic security are urgent and deeply intertwined. The Department of Energy supports the President's goals of providing for our Nation's energy security, growing our economy, and reducing green house gas emissions through the creation of a new energy economy founded on significant changes in the ways we produce and consume energy. These challenges will not be met solely by incremental improvements to existing technologies. Achieving these goals will require transformational technologies that provide clean, reliable, economic energy solutions that are sustainable in the long term.

Orchestrating rapid, transformative changes to the energy system portfolio represents a technological challenge of historic scale. Success will require major national mobilization of basic and applied energy research capabilities, accompanied by commensurate investments in engineering and development necessary to accelerate the deployment of revolutionary energy technologies. Early and close coordination with the private sector to facilitate transition to deployment is also essential. The development of the atomic bomb under the Manhattan Project and of radar technology at the MIT Radiation Laboratory during World War II, and the invention of the transistor at Bell Laboratories in the 1950s stand as proof that exceptionally rapid technological breakthroughs are possible. A hallmark of these research efforts was the focus of highly collaborative fundamental research and technology development capabilities of peerless quality and significant scale on a specific technological challenge, as well as constant dialog with the "user" of the technology.

The leaders of these efforts—scientists themselves—understood the necessity of close-quarters give-and-take between those involved in fundamental research and technology development. The paths of scientific discovery and technological need inform each other: Advances in basic sciences create entirely new technology possibilities; likewise, technology development efforts identify key roadblocks that require improved scientific understanding or wholly new approaches. Connecting fundamental research and technology development through forceful and scientifically astute management of an integrated team was essential to these rapid achievements.

The Energy Innovation Hubs embrace this centrally led "integrated" model of research towards a challenge goal. The Department recognizes that the traditional "staged" model of separate entities undertaking discovery science, technology development, demonstration, and finally deployment is not likely to provide the scale and pace of effort necessary to produce the revolutionary solutions we need in the near term. Rather, there is a need for bold and innovative approaches that better couple all elements of the

Nation's innovation system and combine the talents of universities, national labs, and the private sector in concerted efforts to define and construct a sustainable energy economy.

The purpose of the Energy Innovation Hubs will be to assemble the most talented scientists and technologists to focus intense research and development efforts on the critical areas listed above. The Hubs are designed to accelerate the current state-of-the art energy science and technology toward their fundamental limits and support high-risk, high-reward research projects that produce revolutionary changes in how we produce and use energy. Ideally, each Hub will have a central location housing many investigators, who will likely span multiple disciplines. Each Hub may be led by universities, private for-profit or non-profit firms, or DOE/NNSA laboratories.

Each Hub research focus area was selected based on the following considerations:

- The focus area problem represents a significant grand challenge, with advances that are likely to have a major impact on energy production or usage, greenhouse gas emissions, and economic growth.
- Although the scientific community may have addressed the focus area problem for decades through research at the individual-investigator or group level, what is needed today is a large-scale coordinated, multidisciplinary, systems-level approach that matches the complexity of the technical issues of efficiency, manufacturability, deployment, and utilization.

Additional illustrations that provide potential models for the successful management and operation of a Hub can be found on the Energy Innovation Hubs website: http://www.hubs.energy.gov/ . These include not only current examples of collaboration between industry and practitioners of basic and applied R&D in both academia and national laboratories, but also historical lessons from previous successful R&D centers. These examples highlight the critical role of great scientific leadership in the acceleration of progress, and that integration of foundational science and concentrated engineering efforts can have tremendous long-term impact on science and technology well beyond the mission of the center.

E. HUB DEVELOPMENT REQUIREMENTS

Overview

The Energy Innovation Hubs will take a holistic, systems approach to science and technology and will act as an integrator of basic and applied research and development. The scientific problems to be addressed by the Hub are inherently interdisciplinary. The Hub will require personnel with varied skills and expertise in areas that may include physics, chemistry, materials science, biology, and engineering, among other possible areas.

In addition, it will be critical for the Hub's research team to understand in depth the potential roadblocks and bottlenecks that must be overcome in order to implement a sustainable and commercially viable technology. The Hub will need to combine exceptional skill and creativity in general energy technology research with cutting-edge expertise in the specific problems to be addressed, either by including researchers specializing in this field or developing strong partnerships and working relationships with

the individuals and institutions, governmental and nongovernmental, that have been engaged in research on these or related problems. The Hub is also expected to develop enabling technologies to facilitate and accelerate this research.

The Hub is expected to foster and encourage robust interaction with private industry to accelerate technological innovation and reduce the barriers to movement of new technologies to the marketplace. The Hub will support additional analysis and practical efforts aimed at understanding and achieving technology transfer and eventual large-scale commercialization and deployment of cost-effective technologies, including addressing the environmental, economic, and infrastructural dimensions of this challenge.

Infrastructure and Operation

Strategies for development of the Hub may include renovation of existing buildings and leasing buildings. The Hub will be funded at a total of $22 million in FY 2010 and up to $10 million of this total may be devoted to infrastructure start-up for the Hub. Allowable costs include those necessary to house the Hub (including a possible lease for the first five years of the project), to renovate laboratories as needed, and to purchase research equipment and instrumentation. No new construction (new buildings or additions to existing buildings) will be allowed in the Hub award.

The Hub may develop agreements with respect to access to major scientific instrumentation, including DOE user facilities, on an as-needed basis rather than as an integral component of the initial Hub request and budget since funding at DOE user facilities is determined and administered separately from this announcement.

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Technical Capabilities and Instrumentation

The Hub will need to include all technical capabilities the applicant considers necessary to implement its proposed approach, including experimental and computational tools. In order to carry out the proposed research program, the Hub will be expected to develop core capabilities in or have access to the full range of synthetic, characterization, manipulation, and computational capabilities requisite for the development of a solar fuel generation process. A portion of the research at the Hub may be devoted to developing new technological capabilities for overcoming challenges that cannot be addressed with currently available technologies and instrumentation. Research capabilities and resources to be accessed outside of the Hub should be clearly identified.

Management

DOE recognizes that effective management of scientific facilities, programs, and projects is critical to the success of research. The Hub must have well-designed management plans for the establishment of the Hub as well as for Hub operations. Plans should include provisions for coordination with other basic and applied research and development activities supported by the Department. The Hub's management structure must enable empowered scientist-managers to execute quick decisions to shape the course of research. Management of the Hub's initial establishment, research, technology development, resources (both personnel and physical resources), and scientific data are critical to the success of the Hub, to its overall contribution to the Energy Innovation Hubs initiative and Department's missions. In addition, each Hub

must have an advisory board that includes industry (private for-profit and non-profit) participation.

Key elements for the successful management of a Hub include:

- a clear lead institution with strong scientific leadership and central location for the Hub;
- to the extent that there is geographic distribution of the Hub participants, a clear commitment to the use of state-of-the-art technology and frequent virtual meetings to enable meaningful long distance collaboration; and most importantly
- a clear organization and management plan for achieving the collaborative and synergistic goals of a Hub and "infusing" a culture of empowered central research management throughout the Hub.

The Hub will be subject to regular and rigorous peer review of their scientific program and their management structure, policies, and practices. Within DOE, there will be an Energy Innovation Hub Oversight Board that will periodically review the progress of the Hubs. Each Hub will be managed by a particular DOE program office, which will be responsible for holding the Hub accountable and conducting annual site visit reviews of the Hub. The Hub Oversight Board will consist of the Secretary and/or his designate, the Under Secretaries for Energy and Science, and their senior scientific/technical advisors.

Staffing

The research program of the Hub should be led by internationally-recognized scientists. A Hub may be composed of diverse institutions including national laboratories, academia and non-profit research institutes, and the private sector. In assembling its research team, the Hub should strive to achieve the synergies that arise when individuals with forefront expertise in different methodologies, technologies, disciplines, and areas of content knowledge tackle a problem together, overcoming impasses by attacking the issue from fresh angles and discovering novel solutions.

Quality Assurance and Information Management

Applicants will be expected to have sound quality assurance plans for all aspects of the Hub proposed programs. National and international standards for quality assurance for the different categories of experimentation to be carried out in the Hub should be identified and plans for qualifying for International Organization for Standardization (ISO) and other certifications should be described in the application as appropriate.

Deliverables / Benchmarks

The work of the Hub will span from basic research to engineering development to an eventual transition to industrial development. The Hub will support cross-disciplinary research and development focused on the barriers to transforming energy technologies into commercially deployable materials, devices, and systems. They will advance highly promising areas of energy science and technology from their early stages of research to the point that the risk level will be low enough for industry to deploy them into the marketplace. As such, all of the Energy Innovation Hubs are expected to have

deliverables or benchmarks that help focus the objectives of the research to the proposed short, intermediate, and long term goals they are addressing.

Training and Outreach

The Hub should include educational/training programs for students, postdoctoral fellows, and scientists. On-site scientific staff as well as visiting researchers should be included in proposed, regularly available programs. Outreach activities in which the Hub interacts with the public in educational activities are also encouraged, but not required.

Research Integration and Coordination

Applicants should describe plans for integrating the results of their fundamental research and technology development with other basic and applied research and development activities supported by the Department, including the work conducted at the other Energy Innovation Hubs. The Hub may require research and technology capabilities that are beyond the scope of the Hub's skills and resources; if so, the application should demonstrate plans for obtaining these additional capabilities, including collaboration with outside scientists. In the course of pursing a focused R&D plan for the Hub, it is likely (and desirable) that new avenues of basic and applied R&D will be discovered. To the extent that such new opportunities diverge from the Hub's primary mission, they should be "spun out" as potential candidates for support from other programs within or outside of the Department.

Collaboration with Industry

The Hub is expected to foster and encourage robust interaction with private industry beyond the scope of R&D directly funded through this FOA. The interactions should aim at accelerating technological innovation and reducing the barriers to movement of new technologies to the marketplace. Examples of this type of activity include (but are not limited to) industry-sponsored research partnerships, research personnel exchanges, industry-sponsored post-doctoral or graduate fellowships, and industry-sponsored seminars and conferences. Applicants are encouraged to provide information regarding their plans to create a research environment that promotes collaboration with industry to enable organizational cognizance of industry readiness, technology transfer, and eventual market penetration.

Other considerations

While capital investment in instrumentation and start-up needs are expected as part of the Hub awards, usage and leverage of existing facilities, including the Department's user facilities, is encouraged. DOE user facilities, including light sources, neutron scattering sources, nanoscale science research centers, advanced computational facilities, and other specialized user facilities, are considered foundational resources for a vast range of the scientific user community. As such, they are expected to serve as independent resources for the Hub funded under this announcement. Funding for activities at these DOE user facilities is determined and administered separately from this announcement and should not be included in the budget requests of applications to this announcement.

F. RESEARCH FOCUS: FUELS FROM SUNLIGHT

After nearly 3 billion years of evolution, nature can effectively convert sunlight into energy-rich chemical fuels using the abundant feedstocks of water and carbon dioxide. All fuels used today to power vehicles and create electricity, whether from fossil or biomass resources, are ultimately derived from photosynthesis. While biofuels are renewable resources that avoid the environmental consequences of burning the sequestered carbon of fossil fuels, their scalability and sustainability are ongoing issues. Furthermore, the overall energy efficiency of converting sunlight to plant material and then converting biomass into fuels is low.

The natural photosynthetic apparatus is a remarkable machine, but plants and photosynthetic microbes were not designed to meet human energy needs – much of the energy captured from the sun is necessarily devoted to the life processes of the plants. Imagine the potential energy benefits if we could generate fuels directly from sunlight, carbon dioxide, and water in a manner analogous to the natural system, but without the need to maintain life processes. The impact of replacing fossil fuels with fuels generated directly by sunlight would be immediate and revolutionary. Recognizing this, the Basic Energy Sciences Advisory Committee (BESAC) report, New Science for Secure and Sustainable Energy Future, (http://www.sc.doe.gov/bes/reports/files/NSSSEF_rpt.pdf) lists the production of fuels directly from sunlight as one its three strategic goals for which transformational science breakthroughs are urgently needed.

Basic research has already provided enormous advances in our understanding of the subtle and complex photochemistry associated with the natural photosynthetic system. Similar advances have occurred using inorganic photo-catalytic methods to split water or reduce carbon dioxide. Yet, we still lack sufficient knowledge to design solar fuel generation systems with the required efficiency, scalability, and sustainability for economic viability. This FOA solicits R&D applications for a Fuels from Sunlight Hub that will develop an effective solar energy to chemical fuel conversion system. The system should operate at an overall efficiency and produce fuel of sufficient energy content to enable transition from bench-top discovery to proof-of-concept prototyping. The magnitude of this challenge is daunting, but not insurmountable, and will require that the successful Hub draw expertise and premier scientific talent from the disciplines of chemistry, physics, materials sciences, biology, and engineering.

Critical issues for the Fuels from Sunlight Hub include the following:

(1) *Understanding and designing catalytic complexes or solids that generate chemical fuel from carbon dioxide and/or water*. This research would necessarily be coordinated with complementary efforts to comprehend and design other essential elements required for the overall conversion of solar energy into chemical fuels. These include solar photon capture, energy transfer, charge separation and electron transport. A fundamental concern is the design and discovery of materials that will be cost effective and sustainable in the future economy.

(2) *Integration of all essential elements from light capture to fuel formation into an effective solar fuel generation system.* This would require research and methodology that seek to understand complex issues of the system as an operating unit. Unlike natural photosynthesis, successful systems within the

scope of this FOA should function efficiently at full solar flux; hence, the efficacy of system components should be evaluated in consideration of such a demanding environment. Expertise in complex systems engineering will be required to affect this integration.

(3) *Pragmatic evaluation of the solar fuel system under development.* While a robust solar fuels industry does not presently exist for deployment of resulting technologies, the Hub should have the capacity to determine the practicality of a solar fuel system as a prototype and as a potential product in the marketplace. Guidance and input from industry will be an essential aspect of this evaluation.

More detailed information regarding research needs for the production of fuels from sunlight can be found in two of the DOE Basic Research Needs workshop reports: *Basic Research Needs for Solar Energy Utilization* and *Basic Research Needs*: *Catalysis for Energy*. In addition, the conversion of sunlight into chemical fuels requires significant progress in meeting the scientific grand challenges described in the BESAC report*, Directing Matter and Energy: Five Challenges for Science and the Imagination*. All of these reports can be found at: http://www.sc.doe.gov/bes/reports/list.htmlhttp://www.sc.doe.gov/bes/reports/list.html.

More than references, these reports are the end product of a process that defined the scope of the Fuels from Sunlight Hub. Through these Basic Research Needs workshops, the Department of Energy solicited extensive input from the scientific and technical community, including professionals from universities, national laboratories, industry, and non-profits, on the specific barriers to radical progress towards artificial photosynthesis. A detailed explanation of this process and the broad nature of the input collected can be found at: http://www.sc.doe.gov/bes/reports/files/BRN_workshops.pdf.

G. DEFINITION OF TERMS

This information is primarily derived from the article, Energy-Technology Innovation, by Kelly Sims Gallagher, John P. Holdren, and Ambuj D. Sagar, which was published in the *Annual Review of Environment and Resources*, Vol. 31: 193-237 (2006).

Energy Technologies

The term *energy technology* refers to the means of locating, assessing, harvesting, transporting, processing, and transforming the primary energy forms found in nature (e.g., sunlight, biomass, crude petroleum, coal, uranium-bearing rocks) to yield either direct energy services (e.g., heat from fuel wood or coal) or secondary forms more convenient for human use (e.g., charcoal, gasoline, electricity). Also included under the heading of energy technology is the means of distributing secondary forms to their end users and the means of converting these forms to energy services (e.g., electricity to light and refrigeration, electricity and gasoline to motive power).

A distinction is often made between *energy-supply technologies*, meaning those used to bring energy forms to a point of final use, and *energy end-use technologies*, meaning those applied at this point of use to convert an energy form to a service such as light or motive power.

Research and Development (R&D)

Research includes basic and fundamental research that yields discoveries with potential application to the improvement of energy technologies, and applied research and development that is directed at the invention or improvement of specific energy technologies. Development is aimed at converting the fruits of fundamental and applied research into working prototypes of new or improved technologies.

The Office of Management and Budget (OMB) provides the following federal definitions of basic research, applied research, and development in OMB Circular No. A–11 (2006, Section 84, pp 8–9). Federal expenditures in the conduct of R&D are subcategorized by these three definitions. R&D facilities and major equipment are also reported by OMB as a separate subcategory.

- **Basic research** is defined as systematic study directed toward fuller knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications towards processes or products in mind. Basic research, however, may include activities with broad applications in mind.
- **Applied research** is defined as systematic study to gain knowledge or understanding necessary to determine the means by which a recognized and specific need may be met.
- **Development** is defined as systematic application of knowledge or understanding, directed toward the production of useful materials, devices, and systems or methods, including design, development, and improvement of prototypes and new processes to meet specific requirements.

Demonstration and Deployment (D&D)

The *staged model of innovation* as a linear, sequential process beginning with R&D and proceeding to demonstration and finally commercialization is generally refined to capture some two-way or iterative interactions whereby learning in one phase is linked to the other phases. An even more *integrated model of innovation* merges the research, development, demonstration, and deployment (RDD&D) phases by designed interactions between each activity so that no work occurs in isolation. Nonetheless, it is useful to understand and define the stages separately.

The Office of Management and Budget (OMB) does not provide federal definitions of demonstration and deployment in OMB Circular No. A–11. Federal expenditures in the conduct of demonstration activities are usually (but not always) categorized as R&D depending on the nature of the activities. Deployment activities are categorized as non-R&D.

- **Demonstration** activities test scalability and preliminary operating issues to help bring promising technologies closer to market in order to increase chances of adoption by manufacturers. Demonstration projects test new technologies in conditions that approximate real-world applications in order to gain economic and performance data that improve technologies and enhance their potential for commercialization.
- **Deployment** is market support that promotes the adoption of a new technology through greater visibility and familiarization. Even if the technological feasibility was proven during the demonstration phase, there may be a variety of barriers that make

it difficult for the new technology to compete or gain acceptance in the market and thus achieve wide-scale adoption. Deployment activities that help support market penetration can help a new technology reach a tipping point into widespread commercialization. Deployment activities can take many forms, including education, marketing, communication, market research, and other non-R&D market conditioning activities, as well as incentives for adoption.

Section II - AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT

DOE may award cooperative agreements, field work authorizations, or interagency agreements under this Funding Opportunity Announcement. A DOE field work authorization will be awarded to a successful DOE/NNSA Federally Funded Research and Development Center (FFRDC) contractor. Participation by non-DOE/NNSA Federal agencies and their FFRDC contractors' team will be funded under an interagency agreement. A cooperative agreement will be awarded to any other successful entity including, but not limited to, universities, non-profit organizations, and for-profit organizations.

If determined appropriate, DOE will consider awarding Technology Investment Agreements (TIAs) to a non-FFRDC awardee. TIAs, governed by 10 Part CFR 603, are assistance instruments that DOE can use to increase involvement of commercial entities in research, development, and demonstration programs. DOE can award a TIA as a cooperative agreement or as an assistance transaction other than a cooperative agreement. In both cases, DOE has greater flexibility in tailoring the terms and conditions of the TIA, which is not subject to all of the requirements of 10 CFR Part 600. Agreement terms are negotiable in areas such as audits and intellectual property rights that may cause concern for commercial firms that usually do not contract with the Government. A non-FFRDC applicant may request a TIA if it believes it will be beneficial to the R&D objectives of the program. After an applicant is selected for award, the Contracting Officer will determine if awarding a TIA would provide benefits to the program that would not likely be realized under another type of assistance award. As described below, DOE will be more amenable to awarding a TIA in support of a proposal from a consortium or a teaming arrangement that includes cost sharing with the private sector. Such a consortium or teaming arrangement could include a DOE/NNSA FFRDC, other Federal agency or its FFRDC. If the DOE/NNSA FFRDC contractor is a part of a consortium or teaming arrangement, the value of, and funding for the DOE/NNSA FFRDC contractor portion of the work will be authorized and funded under the DOE field work authorization system and performed under the laboratory's Management and Operating (M&O) contract. Funding for another Federal agency or its FFRDC would be through an interagency agreement under the Economy Act or other statutory authority. Other appropriate contractual accommodations such as those involving intellectual property may be made through the funds in agreement to facilitate the FFRDC's participation in the consortium or teaming arrangement. If a TIA is awarded, certain types of information described in 10 CFR § 603.420(b) are exempt from disclosure under the Freedom of Information Act for five years after DOE receives the information.

B. ESTIMATED FUNDING

This Hub will be funded at up to $22,000,000 in the first year of the award, with up to $10,000,000 to be used in the first year for the establishment of Hub infrastructure, including building renovation (but no new construction), lease arrangements, equipment, and instrumentation. This Hub will be funded at $25,000,000 per year in years 2-5 of the initial award period, pending Congressional appropriations. .

C. MAXIMUM AND MINIMUM AWARD SIZE

Ceiling (i.e., the maximum amount for an individual award made under this announcement): $122,000,000.00

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

D. EXPECTED NUMBER OF AWARDS

DOE anticipates making one award under this announcement.

E. ANTICIPATED AWARD SIZE

DOE anticipates that a single award will be issued for up to $122,000,000 for the total project period**.**

F. PERIOD OF PERFORMANCE

DOE anticipates making one award at an award level up to $22,000,000 in year one of the award and up to $25,000,000 per year in subsequent award years, up to a total of five years.

G. TYPE OF APPLICATION

DOE will accept only new applications under this announcement.

Section III - ELIGIBILITY INFORMATION

A. ELIGIBLE APPLICANTS

All types of domestic entities (defined as any entity incorporated in the United States and having a substantial U.S. presence, as evidenced by having a significant business center and/or significant employment in the U.S.), including DOE/NNSA Federally Funded Research and Development Centers (FFRDC) contractors, are eligible to apply as prime applicants, with the exception of other Federal agencies, non-DOE/NNSA FFRDC contractors, and nonprofit organizations described in section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995. DOE may also consider making an award to a consortium, under a TIA award. See 10 CFR 603.210, 603.225(b), and 603.515.

B. OTHER ELIGIBILITY REQUIREMENTS

Team Arrangements

Entities proposing as a team or consortium must designate a lead organization, with strong scientific leadership and a clearly defined central location. 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 other institution that is part of the team or is a subcontractor**. If an application is received in which the prime applicant is not performing a greater percentage of the effort than that of any individual team member or subcontractor, 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 Section III.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 Hub (team members and/or subcontractors). Foreign entities and non-DOE/NNSA Federal agencies and their FFRDC contractors may not be the lead applicant, but may be proposed as a team member and/or subcontractor. If awarded, the non-DOE/NNSA Federal agencies and their FFRDC contractor team participants would be funded under an interagency agreement or other statutory authority.

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.

DOE/NNSA FFRDC Contractors

DOE/NNSA FFRDC 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 FFRDC Contractor File. If a DOE/NNSA FFRDC 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.

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 in consultation between DOE and the prime awardee.

Non-DOE/NNSA Federally Funded Research and Development Contractors (FFRDC)

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

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

Value/Funding:

The value of, and funding for, a DOE/NNSA FFRDC contractor, a non-DOE/NNSA FFRDC contractor, or another Federal agency's portion of the work will not be included in the award to a successful applicant. DOE will fund a DOE/NNSA FFRDC contractor through the DOE field work authorization system and will fund other non-DOE/NNSA FFRDC contractors and other Federal agencies through an interagency agreement or other statutory authority.

If a TIA is awarded as an assistance transaction other than a cooperative agreement, elements might include shared intellectual property, proprietary access to research results, and other favored relationships consistent with the level of cost sharing and the TIA regulations. Applicants should understand, however, that certain information arising out of the Hubs will be made publicly available consistent with DOE policy (e.g., protein sequences, high-throughput protein production protocols, and unique research resources).

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 any subcontractor.

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

C. COST SHARING

For the purposes of cost sharing, the proposed activities of the Hub are divided into two types, following the definitions put forth in Section I.G, Definition of Terms:

- Basic and applied research and development (R&D)
- Technology demonstration and deployment (D&D)

For-profit entities are required to provide a minimum of 20% cost share for both R&D and D&D activities. This cost share will be based on the portion of the Hub budget proposed by each for-profit entity. For all other non-Federal entities, cost sharing is encouraged, but not required for R&D, and a minimum of 20% is required for D&D activities. The cost share for D&D activities will be based on the portion of the Hub budget proposed by each entity. All entities must include required cost share in their proposed budgets. All cost shared funding must come from non-Federal sources unless otherwise permitted by law.

These cost sharing requirements are consistent with EPAct 2005, Sec. 988. D&D as defined in Section I.G falls under the category of "demonstration and commercial application" specified in EPAct 2005, Sec. 988. However, there is no expectation that a Hub will commercialize the energy technology it develops, but will assist in the deployment of that technology through transfer to industry, which will perform the commercial applications.

Cost sharing is also generally required for TIA awards. To the maximum extent practicable, the non-Federal parties performing the work under a TIA are to provide at least 50% cost sharing in conformance with 10 CFR 603.525 through 10 CFR 603.555. The Contracting Officer will consider the amount of cost sharing proposed in determining if a TIA is the appropriate instrument for a project. The Contracting Officer may accept any cash or in-kind contributions that meet the criteria set forth in 10 CFR 603.530 through 10 CFR 603.555. In addition, the Contracting Officer may consider whether cost sharing is impracticable, after assessing the Applicant's other commitments to successfully performing the work.

Section IV - APPLICATION AND SUBMISSION INFORMATION

A. ADDRESS TO REQUEST APPLICATION PACKAGE

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

Limitation on Number of Lead Applications

A specific entity may not submit more than **one** application as the prime applicant for this particular FOA. If more than one application is received from a prime applicant, DOE will consider only the first 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 limitation on the number of applications in which a specific eligible entity participates as a team member/subcontractor.

B. LETTER OF INTENT AND PRE-APPLICATION

1. Letter of Intent.

Potential applicants are strongly encouraged to submit a letter of intent by Friday, **January 29, 2010**. This letter is to include a cover sheet containing the name and mailing address of the potential applicant institution, the planned title of the Hub, the name and e-mail address of the Project Director/Principal Investigator, 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 Hub as well as the objectives for the five-year award period of the project;
- An overview of the research and management plan for the proposed Hub; and
- An overview of the plans to provide laboratory and office space for the proposed Hub including estimated cost ranges, to the extent applicable, for leasing, renovation and equipment.

The letters of intent will be used to organize and expedite the merit review process. Failure to submit such letters will not negatively affect a responsive application submitted in a timely fashion. The letter of intent should be sent by E-mail to SolarFuels@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 APPLICATION FORMS

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

1. SF 424 (R&R)

Complete this form first to populate data in other forms. Complete all the required fields in accordance with the pop-up instructions on the form. The list of certifications and assurances referenced in Field 17 can be found on the DOE Financial Assistance Forms

Page at http://management.energy.gov/business_doe/business_forms.htm under Certification and Assurances.

2. RESEARCH & RELATED BUDGET (TOTAL FED + NON-FED)

Complete the RESEARCH & RELATED BUDGET (TOTAL FED + NON-FED) form in accordance with the instructions on the form and the following instructions. You must complete a separate budget for each year of support requested. The form will generate a cumulative budget for the total project period. You must complete all the mandatory information on the form before the NEXT PERIOD button is activated. You may request funds under any of the categories listed as long as the item and amount are necessary to perform the proposed work, meet all the criteria for allowability under the applicable Federal cost principles, and are not prohibited by the funding restrictions in this announcement (See Section IV.G).

Budget Justification (Field K on the RESEARCH & RELATED BUDGET (TOTAL FED + NON-FED)

Provide the required supporting information for the following costs (See form 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 HUB, 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.

3. PROJECT/PERFORMANCE SITE LOCATION(S)

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

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

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

4. RESEARCH & RELATED **Other Project Information**

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

Project Summary/Abstract (Field 7 on the Form)

The project summary/abstract must contain a summary of the proposed activity suitable for dissemination to the public. It should be a self-contained document that identifies the name of the applicant, the Hub Director, the Project Director/Principal Investigator(s), the

project title, the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (i.e., benefits, outcomes), and, 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 1 page when printed using standard 8.5" by 11" paper with 1" margins (top, bottom, left and right) {single spaced} with font not smaller than Times New Roman 12 point. To attach a Project Summary/Abstract, click "Add Attachment."

Project Narrative (Field 8 on the Form)

The project narrative must not exceed 100 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 in Appendices 1 through 16 is 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 three components:

I. Overview of the Project Plan. This section must not exceed five pages and should provide a concise overview summarizing the vision for the proposed Hub including:

- Clearly stated short, intermediate, and long term goals of the Hub;
- The strategy for developing and operating the Hub;
- How the research and development (R&D) components of the Hub will be integrated into an effective whole;
- How the R&D program will address critical research needs in the Hub's topical area; and
- If applicable, the strategy for transitioning Hub activities from R&D into technology demonstration and deployment (D&D).

II. Organization and Management Plan. This section must provide a clear and substantive plan for the organization and management of the proposed Hub, including:

- A comprehensive management plan for a world-leading program that encourages high-risk, high-reward R&D (and D&D if applicable) and

encourages synergy and cohesion among investigators by infusing a culture of empowered central research management throughout the Hub;

- To the extent that there is geographic distribution of the Hub participants, a clear commitment to the use of state-of-the-art technology and frequent virtual meetings to enable meaningful long distance collaboration;
- 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;
- An overview of the scientific and technical expertise in the relevant research disciplines required for the Hub;
- A description of the relevant experience of the lead institution and senior/key personnel in project, program, and personnel management of diverse teams of science and technical professionals for projects of comparable magnitude;
- A description of the relevant scientific and technical expertise and experience of the proposed Hub staff in the research disciplines needed for project success including any plans for collaboration with outside scientists funded by the Department's programs;
- A description of the 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;
- A description of how the Hub leadership will communicate effectively with scientists of all disciplines and promote awareness of the importance of energy science and technology;
- An assessment of the availability of the Hub Director and senior/key personnel, including analysis of their potential involvement in other major projects;
- A description of the roles and responsibilities and prospective membership of an external advisory committee, which must include representation from the appropriate industry(ies);
- A discussion of how the proposed research relates to existing and planned research programs at the lead institution;
- As appropriate, a description of the quality assurance systems and plans to be implemented within the Hub, including national and international standards for the assessments of relevant properties and performance for technologies developed by the Hub.
- A description of how the Hub will manage its work across the complete spectrum of basic and applied R&D (and technology D&D if applicable), and how interaction with private industry will be managed to accelerate technological innovation, including institutional experience/expertise in these activities and any proposed corporate partnerships.

III. Proposed Program of R&D (and D&D if applicable). Applicants must provide detailed information regarding the program proposed for the Hub. This section, which may be organized into subtasks, must clearly describe the

proposed R&D (and D&D if applicable) and:

- Briefly describe the scientific and technical background leading to the application, critically evaluate existing knowledge, and specifically identify the gaps in science and technology that the Hub is intended to fill;
- State concisely the importance of the R&D (and D&D if applicable) described in the application, how the proposed program lies at the forefront in the Hub's topical area, and how the proposed program will have an impact on developing innovative new energy technology within the purview of the Hub;
- Describe a balanced and comprehensive program of R&D (and D&D if applicable) that, as needed, supports experimental, theoretical, and computational efforts and develops new approaches in the Hub's research topic during the initial project period;
- Delineate proposed benchmarks, including an explanation as to how the benchmarks will ensure that the program remains focused on the proposed short, intermediate and long term goals and the approach to measuring performance against the stated benchmarks;
- State the proposed approach to rapidly reconfigure R&D 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;
- Describe the role and intellectual contribution of the Hub 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 Hub including access to existing research space, instrumentation, and facilities at the lead institution and its partners;
- Outline potential scientific and technical obstacles to achieving the research objectives during the initial project period and approaches to be used to overcome them;
- Describe the performance monitoring systems to be utilized to ensure the Hub is established within the proposed scope, cost, and schedule;
- Describe the planned approach to information sharing and data management appropriate for achieving the goals of the proposed Hub;
- Delineate plans to coordinate multiple R&D (and D&D if applicable) efforts, integrating subsystems into a prototype energy technology system;
- If applicable, discuss the integration of basic and applied R&D with technology D&D that will lead to an industrial scale application of Hub innovations;
- If applicable, provide detailed plans to foster and encourage robust interaction with private industry to accelerate technological innovation and reduce the barriers to movement of new technologies to the marketplace;
- (Optional) Provide an account of any preliminary studies that may be pertinent to the proposed R&D (and D&D if applicable). Include any

other information that will help to establish the experience and competence of the investigators to pursue the proposed project.

Appendices (Field 12 on the Form) (not included in Project Narrative page limits above)
In addition to the contents of the Project Narrative described above, a separate file for each of the Appendices identified below (1 through 16) must be attached to Field 12 on the form. **Do not attach any of the requested Appendices as files for fields 8, 9, 10, and 11.**

Appendix 1: 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 2: Budget Summary

In simple tabular form, provide a high-level summary of the proposed budget for the Hub that includes the following data by year for each institution participating in the project, beginning with the lead institution: institution name, the Hub operating budget for the institution, the Hub equipment budget for the institution, the names and support levels (in months) of the senior/key personnel supported by the Hub at the institution, and the number and type of other personnel supported by the Hub at the institution (i.e., postdocs, graduate students, undergraduate students, technical support, administrative support, etc.). Budget information should be presented as both annual funding and the cumulative funding over the five-year initial award period.

Appendix 3: Environment, Safety and Health (ES&H) and Security Approaches

Applicants should provide information on:

The approach for handling environment, safety and health, and security issues and assuring environmental compliance during Hub establishment and research and development activities; Procedures for ensuring security, including access to data stored on Hub computers; The ES&H compliance history of the lead and partner institutions over the last five years (e.g. EPA and state environmental notices of violation, OSHA citations, status of any resulting action plans); and any anticipated environmental permit requirements, including NEPA, for the proposed Hub and proposed schedule for compliance with environmental permits and NEPA requirements.

Appendix 4: Intellectual Property (IP) Management Plan

Each Hub should include within their application a proposed IP Management Plan that

ensures and facilitates compliance with Federal IP law and policy, the public interest regarding dissemination of scientific reports/results, and the rapid transfer of technology in the topical area of the Hub. The plan should address title to inventions and other IP among the Hub members. Unless the applicant requests a TIA, the statutes governing disposition of title to new inventions under Government agreements will be followed:

i. The Bayh-Dole Act, 35 U.S.C. 200 et seq., requires that Universities, Non-Profits and small business who are participating under a funding agreement will have the option to retain title to their own employees' inventions.

ii. The Federal Non Nuclear Energy Act of 1974, 42 U.S.C. 5908, will govern disposition of title for all other parties, regardless of whether they receive government funding and requires that the Government obtains title to new inventions unless a waiver is granted. DOE regulations at 10 C.F.R. 784 address the factors that are considered in the granting of waivers, including whether the waiver is needed to secure participation, private investment being made or likely to be made, the commercial position of the waiver requestor, etc.

iii. Inventions made by employees of an FFRDC will be subject to the M&O contract terms and conditions with respect to ownership of inventions made by lab employees.

iv. The agreement will provide the capability for the Hub to license other forms of IP such as copyright in software and bailment of biological materials.

This FOA allows applicants to request a TIA. In a TIA the intellectual property rights are not subject to the requirements of the Bayh-Dole Act or 42 U.S.C. 5908 and are negotiable. If the applicant requests a TIA and DOE determines it is appropriate to award a TIA, patent rights will be negotiated pursuant to the guidance set out in 10 C.F.R. 603.840 through 10 C.F.R. 603.875

The plan should also address a simplified means of IP licensing by the Hub, and should include a discussion on the means to distribute the benefits (royalties and equity) after expenses of any licensing among appropriate team members.

Appendix 5: Hub Site, Acquisition, Design and Development Plan

Discuss the plans for locating the proposed Hub. This includes identification of the site or sites where the major activities of the Hub will take place and how the site(s) will be acquired (use of space provided by the host institution(s), leased space, or combinations of these and other options) and prepared for use by the Hub. The application should describe the proposed size, conceptual layout, and development strategy (including summary-level scope, schedule and cost estimates including alteration and/or renovations for the space, i.e., the estimated cost to build out the space) for the space needed to house and support the research program identified in the narrative. Plans for acquisition of major equipment and instrumentation (items costing $1 million or more) should be included.

Appendix 6: Funding Plan

Discuss strategy for development of funding for the proposed Hub including, but not limited to, cost sharing (if applicable) and DOE funding.

Appendix 7: Project Timetable

This section should outline as a function of time, year by year, all the major activities or phases of the proposed Hub. The successful applicant will be expected to employ standard project management discipline and must use this project timetable to report progress.

Appendix 8: Biographical Sketches

Provide a biographical sketch for the Hub 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: For 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 most closely related to the proposed project 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 most closely related to the proposed project 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.

Appendix 9A: Hub Director Statement of Employment

Hub Director Statement of Employment: For the Hub Director, submit documentation stating that the proposed Hub Director is either currently an employee of the prime applicant, or has committed to accept employment with the prime applicant, if the applicant receives a Hub award. The statement of employment, or letter of commitment to accept employment, is limited to one page and must be signed by both the Hub Director and an authorized representative of the prime applicant.

Appendix 9B: Individual Commitment Statements

Individual Commitment Statement: For each senior/key person, including the Hub Director(s) and Principal Investigator(s), provide a current signed and dated 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.

Appendix 10: Current and Pending Support

Provide a list of all current and pending support (both Federal and non-Federal) for the Hub 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 11: 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 12: 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 13: 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 14: Organizational Letters of Commitment

A single organizational letter of commitment is required from each organization participating as a team member. Each letter of commitment must be current, signed, and dated from an organization participating as a team member must be signed by the person authorized to commit the organization to a legally binding agreement for this project. 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 15: Commitment Letters from Third Parties Contributing to Cost Sharing

If a third party, (i.e., a party other than the organization submitting the application) proposes to provide all or part of any proposed cost sharing, you must provide a letter from the third party stating that it is committed to providing a specific minimum dollar amount of cost sharing. The letter should also identify the proposed cost sharing (e.g., cash, services, and/or property) to be contributed. Letters must be signed by the person authorized to commit the expenditure of funds by the entity. Provide this information in a single file named “CLTP.pdf” and click on “Add Optional Other Attachment” to attach.

Appendix 16: Other Attachments

If you need to elaborate on your responses to questions 1-5 on the “RESEARCH & RELATED Other Project Information” form, please provide this information as Appendix 16.

5. R&R Subaward Budget (FED/NON-FED) Attachment(s) Form

Budgets for Subawardees. You must provide a separate cumulative R&R budget for each subawardee, including DOE/NNSA National Laboratory Contractors, that is expected to perform work estimated to be more than $100,000 or 50 percent of the total work effort (whichever is less). 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. If a subaward is being proposed for a DOE/NNSA National Laboratory Contractor, then you must also submit the appropriate Field Work Proposal and cognizant Federal Contracting Officer authorization as described in "**Budget for DOE/NNSA National Laboratory Contractor"** below.

If a subaward is being proposed for a non-DOE/NNSA FFRDC contractor, the required authorization by the cognizant Contracting Officer for the Federal sponsoring agency, as required in Section III.B., Other Eligibility Requirements, must be submitted.

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

If a DOE/NNSA National Laboratory contractor is to perform any portion of the work, the DOE/NNSA National Laboratory must provide a DOE Field Work Proposal in accordance with the requirements in DOE Order 412.1A, Work Authorization System. This order and a sample of the DOE Field Work Proposal (FWP) form are available at 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 Federal Contracting Officer approval authorizing the participation of the DOE/NNSA National Laboratory as described in Part III.B. 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.

6. Disclosure of Lobbying Activities (SF-LLL)

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

D. SUMMARY OF REQUIRED FORMS AND FILES

Your application must include the following documents:

Name of Document	Format	Attach to
SF 424 (R&R)	Form	N/A
RESEARCH & RELATED BUDGET (TOTAL FED + NON-FED)	Form	N/A
Budget Justification	PDF	Field K
PROJECT/PERFORMANCE SITE LOCATION(S)	Form	N/A
RESEARCH & RELATED Other Project Information	Form	N/A
Project Summary/Abstract	PDF	Field 7
Project Narrative	PDF	Field 8
Project Narrative Appendices 1-16	PDF	Field 12
R&R SUBAWARD BUDGET (FED/NON-FED) Attachment(s) Form, if applicable	Form	N/A
Budget for Subawardees		
Budget for DOE/NNSA National Laboratory Contractor, if applicable	PDF	N/A
SF-LLL DISCLOSURE OF LOBBYING ACTIVITIES, if applicable	Form	N/A

E. SUBMISSION FROM SUCCESSFUL APPLICANT

The successful applicant must submit the information listed below not later than 15 calendar days after notification of selection. Successful applicants who fail to provide the information within the required time period may be eliminated from further consideration.

What to submit	Required Form or Format
Designated Responsible Employee for complying with national policies prohibiting discrimination. Provide organization name, project title, DOE application tracking number and the name, title, and phone number of Designated Responsible Employee for complying with national policies prohibiting discrimination (See 10 CFR 1040.5).	No special format. E-mail information not later than 15 calendar days after selection to: marlene.martinez@ch.doe.gov
Representation of Limited Rights Data and Restricted Software	Use form on Applicant and Recipient Page at http://grants.pr.doe.gov. E-mail this representation not later than 15 calendar days after selection to marlene.martinez@ch.doe.gov
Environmental Evaluation Notification Form. You must complete and submit this environmental questionnaire. NOTE: The NEPA process must be completed prior to taking any action on the proposed project	This form and instructions are available at http://www.ch.doe.gov/offices/ACQ/docs/ E-mail the completed Environmental

that could have adverse environmental effects or that would limit the choice of reasonable alternatives.	Evaluation Notification form not later than 15 calendar days after selection to marlene.martinez@ch.doe.gov.

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

- Indirect cost information
- Other budget information
- Commitment Letter from Third Parties Contributing to Cost Sharing, if applicable

F. SUBMISSION DATES AND TIMES

1. Pre-application Due Date

Pre-applications are not required.

2. Application Due Date

Applications should be received by Monday, March 29, 2010, not later than 11:59 PM Eastern Time. You are encouraged to transmit your application well before the deadline. APPLICATIONS RECEIVED AFTER THE DEADLINE WILL NOT BE REVIEWED OR CONSIDERED FOR AWARD.

G. INTERGOVERNMENTAL REVIEW

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

H. FUNDING RESTRICTIONS

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

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

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

In the event a TIA is awarded, pre-award costs may be charged to the agreement only with the specific approval of the Contracting Officer, in accordance with 10 CFR 603.830.

I. 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 calendar 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 *Marketing Partner identification Number* (MPIN). When you have completed the process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e., Grants.gov registration).

3. APPLICATION RECEIPT NOTICES

After an application is submitted, the Authorized Organization Representative (AOR) will receive a series of 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. You will need the Submission Receipt Number (email Number 1) to track a submission. The titles of the four e-mails are:

Number 1 - Grants.gov Submission Receipt Number

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

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

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

Section V - APPLICATION REVIEW INFORMATION

A. CRITERIA

1. Initial Review Criteria

Prior to a comprehensive merit evaluation, DOE will perform an initial review in accordance with 10 CFR 605.10(b). DOE will perform an initial review to determine that (1) the applicant is eligible for an award; (2) the information required by the announcement has been submitted; (3) all mandatory requirements are satisfied; and (4) the proposed project is responsive to the objectives of the Funding Opportunity Announcement.

2. Merit Review Criteria

Applications will be evaluated by a Merit Review Panel using the criteria listed below. Following completion of the merit review, a team composed of Federal officials will: review the applications and the Merit Review Panel evaluations; summarize the Merit Review Panel's independent evaluations 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 criteria. Included within each criterion are the detailed questions that reviewers should consider.

a. Scientific and/or technical merit of the project:

- Will the Hub research program provide R&D (and D&D if applicable) that is in the forefront in the research area pertinent to the Hub during the initial project period?
- Is the proposed program for the Hub appropriately focused on the research topic of the Hub?
- Is the proposed program for the Hub likely to have a real impact on the energy technology within the Hub's purview?
- Is a well a balanced and comprehensive R&D (and D&D if applicable) program that, as needed, supports experimental, theoretical, and computational efforts and develops new approaches in the Hub's research topic presented?
- Is the R&D (and D&D if applicable) program for the proposed Hub well focused on its stated short-, intermediate-, and long-term goals?
- Are the deliverables and benchmarks proposed to ensure the research remains focused on the stated goals and the approach to measuring performance against the stated benchmarks adequate and appropriate?
- What is the likelihood that the applicant can overcome key scientific and technical challenges and shift research directions in response to promising developments?

b. Appropriateness of the proposed method or approach:

- Is the strategy and plan for the development and operation of the proposed Hub, including plans for external oversight and guidance for the scientific and technical direction and approval of the research program, scientifically and technically appropriate?

- Does the program proposed by the applicant adequately address research needs/gaps in the Hub topical area and is the R&D (and D&D if applicable) program likely to contribute to reaching the proposed short, intermediate, and long term goals?
- Does the proposed approach allow rapid reconfiguration of R&D thrusts to respond to key scientific challenges and promising developments?
- Are the plans for external collaborations and partnerships, including utilization of DOE user facilities clearly delineated?
- Is the applicant's program for 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, adequate?
- Are the plans for external collaborations and partnerships reasonable and appropriate?
- Is the plan for quality assurance appropriate for the proposed Hub?
- Is the planned approach to information sharing and data management appropriate for achieving the goals of the proposed Hub?

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

- Is the proposed access to existing research space, instrumentation and facilities at the host institution and its partners likely to meet the needs of the proposed Hub?
- Are the applicant's performance monitoring systems adequate to assure Hub is established within the scope, cost and schedule of the proposal?
- Do the applicant's key personnel have a proven record of R&D (and D&D if applicable) productivity and experience in the disciplines needed for success in this project?
- Do the applicant and the applicant's senior leadership team members for the Hub have proven records of success in project, program, and personnel management of diverse teams of science and technical professionals and for projects of comparable magnitude?
- Is the plan for recruiting additional scientific and technical personnel reasonable and appropriate?

d. Reasonableness and appropriateness of the proposed budget:

- Is the requested budget for developing the proposed Hub appropriate, including the costs of acquiring and preparing the space to house the Hub and the equipment and instrumentation to be acquired for it?
- Is the plan for acquiring and preparing the space to house the Hub cost-effective?
- Is the requested operating budget for the proposed Hub reasonable for the planned program?

e. Integration of research and development (R&D) and, if applicable, demonstration and deployment (D&D):

- Does the project have a clear plan to coordinate multiple R&D efforts, integrating subsystems into a prototype energy technology system?
- Does the project present a coherent plan for the integration of basic research and engineering development that will lead to prototype-scale application of energy technology that would be developed by the Hub?
- If applicable, does the applicant present a coherent plan for transitioning Hub R&D into technology D&D?
- If applicable, does the applicant present an adequate plan to foster and encourage robust interaction with private industry to accelerate technological innovation and reduce the barriers to movement of new technologies to the marketplace?

f. Hub management plan:

- Does the applicant present a comprehensive management plan for a world-leading program that encourages high-risk, high-reward R&D (and D&D if applicable) and encourages synergy and cohesion among investigators by infusing a culture of empowered central research management throughout the Hub?
- To the extent that there is geographic distribution of the Hub participants, is there a clear commitment to the use of state-of-the-art technology and frequent virtual meetings to enable meaningful long distance collaboration?
- Does the applicant present an organizational structure that delineates the roles and responsibilities of senior/key personnel and describes the means of providing external oversight and guidance for scientific and technical direction and approval of the research program?
- Is the role of the external advisory committee adequately described and appropriately staffed?
- Does the applicant present a plan that defines how it will manage its work across the complete spectrum from basic research through engineering development and, if applicable, on to

  commercialization of innovative energy technology, including institutional experience/expertise in these activities and any proposed corporate partnerships?

g. Environment, safety and health and security considerations:

- Is the approach for handling environmental, safety and health and security issues appropriate?
- Does the approach assure environmental compliance during Hub establishment and R&D (and D&D if applicable) activities?

- Do the lead and partner institutions have a strong history of compliance with ES&H requirements?

3. Other Selection Factors

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

- Diversity of research activities that will lead to new and expanded options for energy technology with the Hub's purview;
- Integration of the proposed Hub with the other research and development programs in DOE;
- Strategy for developing synergies between this new Hub and existing institutional infrastructure and science;
- Potential to be recognized as an internationally recognized research enterprise that sets new standards for management of research;
- Potential to attract the pre-eminent scientists and managers required to accelerate the solutions needed to create a new research paradigm while demonstrating sound financial stewardship;
- Strategy for development of funding for the Hub including, but not limited to, cost sharing and DOE funding;
- Total amount of DOE funds available; and
- Applicant's approach to intellectual property and technology transfer as described in its IP Management Plan.

B. REVIEW AND SELECTION PROCESS

1. Merit Review

Applications that pass the initial review will be subjected to a merit review in accordance with the guidance provided in the "Department of Energy Merit Review Guide for Financial Assistance"; 10 CFR Part 605.10(d); and, the criteria set forth in Section V.A.2.of this FOA. This Guide is available under Financial Assistance, Regulations and Guidance at http://www.management.energy.gov/documents/meritrev.pdf

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 recommendation, Federal official's review, program policy factors, and the amount of funds available. As part of the selection process, DOE reserves the right to seek clarifications in writing from those applications deemed to have the highest scientific merit in order to facilitate the selection process.

3. Negotiations and Award

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

C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES

Selection and Award Date

DOE anticipates notifying applicants selected for award by June 2010 and making awards by September 2010 or earlier.

Section VI - AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES

1. Notice of Selection

- **Selected Applicant Notification**

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

- **Non-selected Notification**

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

2. Notice of Award

If the selected applicant is a non-FFRDC, an Assistance Agreement issued by the Contracting Officer is the authorizing award document. It normally includes either as an attachment or by reference: (1) Special Terms and Conditions; (2) Applicable program regulations, if any; (3) Application as approved by DOE/NNSA.; (4) DOE assistance regulations at 10 CFR Part 600 and, if applicable, the Government wide Research Terms and Conditions, and DOE Agency Specific Requirements; (5) National Policy Assurances To Be Incorporated As Award Terms; (6) Budget Summary; and (7) Federal Assistance Reporting Checklist, and Instructions, which identifies the reporting requirements.

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

DOE/NNSA FFRDC contractors participating as team members will be funded directly by DOE/NNSA through the DOE field work authorization system. Non-DOE/NNSA FFRDC contractors and other Federal agencies will be funded under an interagency agreement.

B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

1. Administrative Requirements

The administrative requirements for DOE grants and cooperative agreements are contained in 10 CFR Part 600 (See: http://ecfr.gpoaccess.gov). Grants and cooperative agreements made to universities, non-profits and other entities subject to OMB Circular A-110 are subject to the Research Terms and Conditions located on the National Science Foundation web site at http://www.nsf.gov/bfa/dias/policy/rtc/index.jsp.

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.

Statement of Substantial Involvement: Either a cooperative agreement or DOE Field Work Authorization may be awarded under this announcement. If the award is a cooperative agreement, the DOE Specialist and DOE Project Officer will negotiate a Statement of Substantial Involvement prior to award. DOE may also consider awarding a Technology Investment Agreement (TIA). A TIA, like a cooperative agreement, also requires substantial Federal involvement in the technical or management aspects of the project and a Statement of Substantial Involvement will also be negotiated prior to the award of any TIA. See 10 CFR 603.105(a).

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

C. REPORTING

Reporting requirements are identified on the Federal Assistance Reporting Checklist, DOE F 4600.2, attached to the award agreement. For a sample Checklist, see http://management.energy.gov/documents/DOEF46002PolicyVersion.pdfhttp://management.energy.gov/documents/DOEF46002PolicyVersion.pdf.

Section VII - QUESTIONS/AGENCY CONTACTS

A. QUESTIONS

Questions regarding the content of the announcement **must** be submitted through the FedConnect portal. You must register with FedConnect to respond as an interested party to submit questions, and to view responses to questions. It is recommended that you register as soon after release of the FOA as possible to have the benefit of all responses. More information is available at: http://www.compusearch.com/products/FedConnect/FedConnect.asphttp://www.compusearch.com/products/FedConnect/FedConnect.asp

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 FedConnect no later than 12:00 Noon Eastern Time on 03/01/2010. DOE will not be responsible for responding to questions submitted after the designated time on 03/01/2010.

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

B. AGENCY CONTACT

Name:	Marlene Martinez
E-mail:	marlene.martinez@ch.doe.gov

Section VIII - OTHER INFORMATION

A. MODIFICATIONS

Notices of any modifications to this announcement will be posted on Grants.gov and the FedConnect portal. You can receive an email when a modification or an announcement message is posted by registering with FedConnect as an interested party for this FOA. It is recommended that you register as soon after release of the FOA as possible to ensure you receive timely notice of any modifications or other announcements. More information is available at http://www.FedConnect.net and http://www.compusearch.com/products/FedConnect/FedConnect.asphttp://www.compusearch.com/products/FedConnect/FedConnect.asp

B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE

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

C. COMMITMENT OF PUBLIC FUNDS

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

Contracting Officer, either explicit or implied, is invalid.

D. PROPRIETARY APPLICATION INFORMATION

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

"The data contained in pages _____ of this application have been submitted in confidence and contain trade secrets or proprietary information, and such data 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 terms and conditions as set forth in 10 CFR 784. (see G. below). If teaming arrangements are created among a prime recipient and other team members, title to subject inventions among the Hub members will be addressed in the required Intellectual Property Management Plan of the Project Narrative, Appendix 4. If DOE determines it is appropriate to award a TIA, patent rights will be negotiated pursuant to the guidance set out in 10 CFR 603.840 through 10 CFR 603.875.

Rights in Technical Data - Special Protected Data Statutes: Since the anticipated award term is up to five years, DOE must have appropriate rights in data to assure long term access to generated data under this award to assure dissemination. Except for the special data protection discussed below, this can be accomplished, either through DOE ownership of and/or unlimited rights in technical data, so that DOE will have access to and the ability to direct delivery of a copy of such data first produced under the Agreement. Delivery or third party licensing of proprietary software or data developed solely at private expense will not normally be required except as necessary to operate the Hubs or 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. This program is covered by a special protected data statute. The provisions of the statute provide for the protection from public disclosure, for a period of up to five (5) years from the development of the information, of data that would be trade secret, or commercial or financial information that is privileged or confidential, if the information had been obtained from a non-Federal party. Generally, the provision entitled, Rights in Data − Programs Covered Under Special Protected Data Statutes, (10 CFR 600 Appendix A to Subpart D), would apply, but may be modified to accommodate particular circumstances(e.g., access to or expanded use rights in protected data among consortium or team members), or to list and identify data or categories of data first produced in the performance of the award that will be made available to the public, notwithstanding the statutory authority to withhold data from public dissemination, and may also identify data that will be recognized by the parties as protected data. The same approach to data rights will apply if DOE determines it is appropriate to award a TIA.

G. NOTICE OF RIGHT TO REQUEST PATENT WAIVER

DOE may issue a class waiver for Agreements awarded under this FOA, which DOE expects will cover most large business recipients and team members of this award. This patent waiver would provide those awardees not subject to the Bayh-Dole Act the option to retain title to their own inventions, subject to the same government retained rights identified above, provided there is cost-sharing of at least 20%, and agreement to substantially manufacture new technology created under an award resulting from this FOA in the U.S., or provide other economic benefits to the U.S. If DOE does not issue a class waiver or if applicants do not meet the criteria or the class 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 http://www.gc.doe.gov/documents/patwaivclau.pdfhttp://www.gc.doe.gov/documents/patwaivclau.pdf.

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

H. NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES

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

I. PROPERTY

REAL PROPERTY: With respect to the use, management, and disposition of all real property, 10 CFR Part 600.132 shall be applicable to cooperative agreements with institutions of higher education, hospitals, and other nonprofit organizations; 10 CFR Part 600.321 shall be applicable to cooperative agreements with for-profit organizations. For DOE/NNSA contractors, the terms and conditions of the respective management and operating contract will apply. For non-DOE/NNSA FFRDC contractors and other Federal agencies, the terms and conditions of the interagency agreement will apply.

PERSONAL PROPERTY: Federally Owned and Exempt, Equipment, and Supplies and Other Expendable Property

With respect to the use, management and disposition of all personal property, 10 CFR 600.133, 134 and 135 shall be applicable to cooperative agreements, with institutions of higher learning, hospitals and non-profit organizations; and 10 CFR 600.321,322,323 and 324 shall be applicable to cooperative agreements with for-profit organizations. For DOE/NNSA contractors, the terms and conditions of the respective Management and Operating contracts will apply. For non-DOE/NNSA FFRDC contractors and other Federal agencies, the terms and conditions of the interagency agreement will apply.

J. ENVIRONMENTAL AND REGULATORY REQUIREMENTS.

The DOE expects Hub establishment and R&D activities to have the same integrity and to be as state-of-the-art as the science that is expected to result from the research supported by DOE that is conducted in the Hubs. Applications to site the Hubs, therefore, should demonstrate that consideration of ES&H risks and issues is an integral component of the early planning for the Hubs. Early identification of ES&H risks and issues can alleviate problems that can affect people and the environment, as well as affect the cost, schedule and management of the Hubs from their establishment through their research operations. DOE, therefore, will consider ES&H criteria, as described in Part V.A.2.g. among its merit review criteria to support demonstration of early ES&H planning. This will provide an early screening of potential issues and problems, as well as provide a measure of the capability of the applicant in providing for sound ES&H planning as part of the project. DOE requires that its state-of-the-art research facilities "start clean and stay clean" with respect to ES&H.

K. 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.

L. COMPLIANCE WITH THE NATIONAL ENVIRONMENTAL POLICY ACT (NEPA).

DOE will comply with the requirements of NEPA and its implementing regulations (10 CFR 1021 and 40 CFR 1500-1508) prior to taking any action on the proposed project that could have adverse environmental effects or that would limit the choice of reasonable alternatives. After selection, an environmental critique and synopsis will be prepared under 10 CFR 1021.216 to assist in developing the agreement with the institution with the preferred site for the Hub. This synopsis will be incorporated, as appropriate, into any future site-specific NEPA documentation that may be prepared to evaluate the potential environmental consequences of the proposed Hub at the preferred site provided by the Host Institution. Should an Environmental Assessment (EA) or an Environmental Impact Statement (EIS) be required, the successful applicant will be required to interact with DOE and provide up-to-date technical details during the NEPA process.

M. AVAILABILITY OF FUNDS

Awards resulting from this Funding Opportunity Announcement are subject to the availability of appropriated funds.

Section IX - APPENDICES/REFERENCE MATERIAL

REFERENCE MATERIAL

U.S. Department of Energy, 2003. *Basic Research Needs for a Secure Energy Future* http://www.sc.doe.gov/bes/reports/files/SEF_rpt.pdf

U.S. Department of Energy, 2003. *Basic Research Needs for the Hydrogen Economy* http://www.sc.doe.gov/bes/reports/files/NHE_rpt.pdfhttp://www.sc.doe.gov/bes/reports/files/NHE_rpt.pdf

U.S. Department of Energy, 2005. *Basic Research Needs for Solar Energy Utilization* http://www.sc.doe.gov/bes/reports/files/SEU_rpt.pdfhttp://www.sc.doe.gov/bes/reports/files/SEU_rpt.pdf

U.S. Department of Energy, 2007. *Directing Matter and Energy: Five Grand Challenges for Science and the Imagination* http://www.sc.doe.gov/bes/reports/files/GC_rpt.pdfhttp://www.sc.doe.gov/bes/reports/files/GC_rpt.pdf

U.S. Department of Energy, 2008. *New Science for a Secure and Sustainable Energy Future* http://www.sc.doe.gov/bes/reports/files/NSSSEF_rpt.pdfhttp://www.sc.doe.gov/bes/reports/files/NSSSEF_rpt.pdf

U.S. Department of Energy, 2009. Energy Innovation Hubs website: http://www.hubs.energy.gov/