

**FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT**



**U. S. Department of Energy
Office of Science
Office of Biological and Environmental Research**

Bioenergy Research Centers

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UPDATES AND REMINDERS

REGULATIONS

This Funding Opportunity Announcement (FOA) and any awards made under it are controlled by 2 CFR 200, the Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards, as modified by 2 CFR 910, the Department of Energy Financial Assistance Rules, and 10 CFR 605, the Office of Science Financial Assistance Program.

DATA MANAGEMENT PLAN

The Office of Science has published a new Statement on Digital Data Management, published at <http://science.energy.gov/funding-opportunities/digital-data-management/>, which governs applications submitted under this FOA, and is detailed in Part IV of this FOA.

ACKNOWLEDGMENT OF FEDERAL SUPPORT

The Office of Science published guidance about how its support should be acknowledged at <http://science.energy.gov/funding-opportunities/acknowledgements/>.

REPORTING

The Office of Science has implemented the federal-wide Research Performance Progress Report (RPPR) through the Portfolio Analysis and Management System (PAMS). The common RPPR format is described at <http://www.nsf.gov/bfa/dias/policy/rppr/>. Progress Reports are generally due 90 days before the end of each budget period. The Principal Investigator (PI) will receive an automated email from PAMS (<PAMS.Autoreply@science.doe.gov>) thirty days prior to the progress report due date. Some information will be prepopulated. Additional details and changes will be contained in the Reporting Requirements Checklist attached to the Assistance Agreement.

RECOMMENDATION

The Office of Science encourages you to register in all systems as soon as possible. Applicants must take the following steps in order to prepare to respond to this FOA if they have not done so already: (1) obtain a DUNS number; (2) Register with the System for Award Management (SAM); (3) Register with FedConnect; (4) Register in Grants.gov; and (5) Register in the DOE

Office of Science Portfolio Analysis and Management System (PAMS). Please see Section IV.H.1., Systems to Register In, for registration instructions. Also, see Section IV.B., LETTER OF INTENT AND PRE-APPLICATION, for instructions for submitting a pre-application via PAMs. See Section IV.C., CONTENT AND APPLICATION FORMS, for additional instructions for submitting a full application via Grants.gov.

You are also encouraged to submit pre-applications (via PAMS) and applications (via Grants.gov) well before the deadlines established in this FOA.

Section I – FUNDING OPPORTUNITY DESCRIPTION

GENERAL INQUIRIES ABOUT THIS FOA:

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

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

STATUTORY AUTHORITY

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

Public Law 109-58, Energy Policy Act of 2005 (EPAAct 2005)

APPLICABLE REGULATIONS

Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards, codified at 2 CFR 200

U.S. Department of Energy Financial Assistance Rules, codified at 2 CFR 910

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

SUMMARY

The Genomic Science Program (GSP) in the Office of Biological and Environmental Research (BER) of the Office of Science (SC), U.S. Department of Energy (DOE), is a fundamental systems biology research program aimed at identifying the foundational principles of biological systems relevant to DOE missions in energy, climate, and the environment. One aspect of the program seeks to develop the science, technology, and knowledge base necessary to enable the cost effective production of specialty biofuels and bioproducts from plant biomass. This Funding Opportunity Announcement (FOA) requests applications from the scientific community for Bioenergy Research Centers (BRCs) that develop novel biological solutions for the production of specialty biofuels and other bioproducts from plants with the potential to enable a more bio-

based economy. For the purposes of this FOA, specialty biofuels are those non-food crop-derived fuels other than ethanol, and bioproducts are those that will replace petroleum derived non-pharmaceutical products. This FOA describes the establishment of multidisciplinary research and technology centers that will conduct comprehensive, integrated research in bioenergy and bioproducts. The BRCs will involve diverse disciplines in sustainability, feedstock development, deconstruction and conversion. Proposals may be multi-institutional, but should focus on the development of a single integrated research center. Ideally, each BRC annual budget is expected to range between \$15 million and \$25 million in DOE funding, but first year budgets may be adjusted to accommodate start-up actualities. The FOA does not include funding for construction of new buildings.

PURPOSE, BACKGROUND, RESEARCH FOCUS AREAS, AND CENTER DEVELOPMENT REQUIREMENTS

PURPOSE

The purpose of the BRC program is to break down the remaining basic science barriers to establishing a commercially viable and sustainable domestic specialty biofuels and bioproducts industry. The BRCs will seek solutions through innovative, integrated, multidisciplinary approaches and strategies, some of which being high-risk, high-reward. BRC research will be at the interface between basic and applied science, will maintain a focus on applications for specialty biofuels and bioproducts, and will provide basic knowledge as well as technical solutions. One measure of a BRC's success will be the ability to focus on critical basic research to de-risk more applied research with the expectation that some BRC-developed technologies will be adopted by industry. It is expected that BRCs will have the benefit of mature technology transfer operations. In addition, it will be critical for the BRC's research team to understand in depth the current industrial-level roadblocks and bottlenecks that must be overcome in order to develop research directions that may resolve those obstacles.

The BRCs will take an integrated systems approach to tackle the inherently fundamental and interdisciplinary challenges to cost efficient production of specialty biofuels and bioproducts from renewable biomass. Each BRC's research team will require varied skills and expertise in disciplines related to sustainability, feedstock development, deconstruction and conversion.

BACKGROUND

Multiple societal benefits underlie the U.S. DOE research efforts to support a viable and sustainable domestic lignocellulosic advanced biofuels and bioproducts industry. These benefits include ensuring future energy security, lowering greenhouse gases to mitigate climate impacts, diversifying the range of available bio-based products, producing less toxic chemicals and byproducts, creating jobs in rural areas, and improving the trade balance. A previous DOE workshop sought ways to realize these benefits by accelerating the emergence of a robust, new cellulosic ethanol industry. The resulting report, *Breaking the Biological Barriers to Cellulosic Ethanol* ([U.S. DOE 2006](#)), outlined a path toward this future, emphasizing integrated research from feedstock development to conversion technologies.

Since then, DOE's Office of Biological and Environmental Research (BER), operating within the Office of Science, has supported transformational bioenergy research through the vertically integrated DOE Bioenergy Research Centers and development of biomass feedstocks and biofuels-relevant microbes. A number of important breakthroughs have resulted from this fundamental research and include (1) the demonstration that lignin composition and deposition can be genetically engineered to reduce plant cell wall recalcitrance without impacting plant viability; (2) development of effective pretreatments that can be adapted commercially to lower costs; (3) discoveries of novel microbes and enzymatic pathways for more efficient deconstruction of lignocellulosic biomass; (4) proof-of-concept research for consolidated bioprocessing (i.e., production of ethanol and other biofuels by naturally cellulolytic microbes); (5) metabolic engineering of microorganisms and plants for biological production of numerous advanced biofuels or their immediate precursors; and (6) identification of hundreds of new plant genes and developing an understanding of their role in cell wall biosynthesis.

Much progress has been made in overcoming several barriers to the production of lignocellulosic biomass and its transformation to ethanol, and these successes can now be leveraged in the production of specialty biofuels and bioproducts. BER's integrative approach is uniquely well positioned to address the basic research challenges associated with the establishment of an economically competitive and sustainable domestic biofuels and bioproducts industry.

Significant advances in plant breeding, molecular genetics, and genomic technologies provide new opportunities to build on existing knowledge of plant biology and more confidently predict and manipulate functional properties of biomass feedstock crops. Similarly, continuing advances in omics-enabled technologies and synthetic biology approaches for microorganisms provide opportunities to further develop non-model microorganisms for applications in industrial biotechnology and for conversion of biomass into biofuels and bioproducts. Most importantly, integrating plant and microbial systems biology with cutting-edge research in chemical engineering, synthetic biology, and computational biology facilitates the kind of scientific breakthroughs needed to foster the development of a sustainable bioeconomy ([OSTP.2012. National Bioeconomy Blueprint. Office of Science and Technology Policy. 48 pp.](#)).

In 2013 and 2014 DOE hosted a pair of workshops entitled "*Research for Sustainable Bioenergy: Linking Genomic and Ecosystem Science*" and "*Lignocellulosic Biomass for Advanced Biofuels and Bioproducts*" which helped to identify remaining basic science challenges that continue to limit the cost effective conversion of plant biomass to advanced biofuels and bioproducts. Five areas for continued research discussed at the workshops include:

Sustainability. The design of sustainable biofuel and bioproduct production systems requires knowledge about interactions between the crops and their environment, the impacts of crop choice and management systems, and key plant-microbe-environmental interactions that provide a range of ecosystem services. Linking these advances to breakthroughs in ecosystem science enables the use of systems biology approaches to the fundamental design of sustainable biofuel and bioproduct production systems.

Feedstock Development. Establishing a sustainable, lignocellulosic biomass-based bioeconomy will require a fundamental shift in how feedstocks are produced, processed, and transported to mills and biorefineries. New bioenergy feedstocks need to be engineered for sustainable production and efficient conversion to biofuels and bioproducts.

Lignocellulose Deconstruction. Further research is needed to make deconstruction processes low cost, low energy, more efficient, with minimal environmental impact, and capable of converting a range of lignocellulosic biomass types into hydrolysates that contain as much of the cellulosic or hemicellulosic sugars as possible for conversion into fuels and chemicals. Additionally, technologies are required to convert the relatively large fraction of carbon found in the lignin portion of lignocellulosic biomass into biofuels and bioproducts. Stronger linkages between advances in biomass development and fuels production will strengthen these deconstruction efforts.

Specialty Biofuels. Advances in metabolic engineering have resulted in an expanded suite of accessible molecules beyond ethanol to potentially serve as biofuels. In order for these to be sustainable and economically viable, advances must be made in platform organism development, pathway efficiency, yield, rate, and metabolite tolerance.

Bioproduct Development from Biomass. This focus recognizes the environmental benefits to be gleaned from using biomass to produce chemicals currently derived from petroleum, and the potential unbounded diversity of new molecules that could be produced from biomass. The synergies between the methods and approaches for biofuel and bioproduct synthesis create an opportunity to leverage basic research in biofuels development with broader possibilities toward advancing a biobased economy ([OSTP.2012. *National Bioeconomy Blueprint*. Office of Science and Technology Policy. 48 pp](#)).

Applicants are encouraged to review the full 2014 workshop report:

[Lignocellulosic Biomass for Advanced Biofuels and Bioproducts: Workshop Report](#)

key supporting documents including:

[Research for Sustainable Bioenergy: Linking Genomic and Ecosystem Sciences](#)

[DOE Genomic Science Program 2014 Strategic Plan](#)

and other background documents including:

[Industrialization of Biology: A Roadmap to Accelerate the Advanced Manufacturing of Chemicals; National Academies Press \(US\); 2015 J](#)

[Biosystems Design: Report from the July 2011 Workshop,](#)

[OSTP.2012. *National Bioeconomy Blueprint*. Office of Science and Technology Policy. 48 pp](#)

RESEARCH FOCUS AREAS

For the purposes of this FOA and specifically, the Research Focus Areas described below, the following clarifications and definitions of terms are provided:

- **Feedstocks** will include dedicated crops for biofuels and bioproducts and non-food crops for oils or other non-pharmaceutical *in planta* produced products.
- **Specialty biofuels** are defined as non-food crop based liquid biofuels other than ethanol.
- **Bioproducts** are those non-pharmaceutical chemicals that directly replace or substitute for chemicals currently derived from petroleum or natural gas.

BRCs must have significant research efforts addressing at least two of the four science focus areas (FA):

- (1) Sustainability,
- (2) Feedstock Development,
- (3) Deconstruction and Separation, and
- (4) Conversion.

The BRCs will integrate the research efforts in the focus areas such that knowledge from one focus area directly informs the research in the other areas. This must be evident from the BRC structure and management. Examples of research topics in each of these areas are given below.

Research focused on **Sustainability** includes, but is not limited to:

- Gaining a mechanistic understanding of how bioenergy crops' interactions with biotic and abiotic environmental factors influence crop growth and yield.
- Process synthesis and technoeconomic evaluation for biomass-to-fuels technologies addressing the economics of biofuel and bioproducts production in order to identify most impactful areas of research.
- Multiscale modeling toward a predictive understanding of the biofuel cropping ecosystem.

Research focused on **Feedstock Development** includes, but is not limited to:

- Enhanced bioenergy feedstocks with improved traits for yield, water use, nutrient uptake and recycling, resilience to biotic and abiotic stress and, conversion to biofuels and bioproducts.
- Genetic tools and biosystems design approaches to advance bioenergy feedstock crop creation and production.
- High-throughput analytical tools to promote bioenergy feedstock crop creation, evaluation and production.
- Field testing of new potential bioenergy feedstock crops under environmentally relevant conditions across multiple geographic regions to assess viability and robustness.
- Quantitative models informed by experimentation to predict how bioenergy feedstock genotypes perform under different geographic and/or environmentally relevant conditions.

DOE emphasizes the need to focus on current or potential feedstock crops such as switchgrass, poplar, Miscanthus, eucalyptus, sorghum, energy cane, etc. Use of model plants as surrogates of feedstock crops should be kept to a minimum. DOE believes that the sophistication of genomic and other omic techniques has advanced sufficiently to allow for focused research on dedicated bioenergy feedstock crops. Model plants may be used as tools to inform the study of the bioenergy feedstocks but there must be a direct link from the model plant to the bioenergy crop. Applications focused on algae, food crop, or starch based systems will be considered non-responsive to this focus area, and thus to this FOA.

Research focused on biomass **Deconstruction and Separation** includes, but is not limited to:

- Feedstock-agnostic deconstruction processes capable of efficiently fractionating biomass into targeted output streams with minimal inhibitor formation.
- Detailed understanding of plant cell wall biosynthesis, composition, structure, and properties during deconstruction.
- Improved enzymes and/or approaches for biomass breakdown and cellulose, hemicellulose and lignin processing.
- Quantitative understanding and multiscale modeling of plant cell wall deconstruction to improve efficiency.

Research focused on **Conversion to Specialty Biofuels and Bioproducts** includes, but is not limited to:

- High-throughput methods to screen or select high-performance strains or constructs to improve product formation rates, titers, yields, and selectivity (i.e., the ability to produce only the desired product minimizing byproducts).
- Development of a broader set of platform microorganisms suitable for metabolic engineering for biofuel and bioproduct production and high throughput methods for experimental validation of gene function.
- New approaches and/or models to predict optimal production pathways; metabolic models that fully articulate the metabolic complexity from genomic and metabolomic data; models that can predict behavior and yields to inform scaled-up applications.
- Techniques to enhance microbial tolerance of toxins to improve fermentation yields; a better understanding of the cellular and molecular bases of tolerance for major chemical classes of inhibitors found in these processes.
- Technologies for consolidated bioprocessing (CBP).
- Identification, creation, optimization and production of atom-economical microbial and chemical pathways to promising intermediates and final bioproducts from biomass that are less toxic and more environmentally benign compared to current products produced from petroleum or natural gas.
- High-throughput, real time, in situ analytical techniques to understand and characterize the pre- and post bioproduct separation streams in detail.
- Methodologies for efficiently identifying viable target molecules; identification of high-value bioproducts in existing biomass streams and utilization of current byproduct streams.
- Identification and improvement of plant feedstocks with enhanced higher extractible levels of desired bioproducts or bioproduct precursors, including lignin streams that are homogenous and consistent.

Research efforts in these FAs must be complemented and supported by robust efforts in computational biology and bioinformatics. It is expected that computation will be incorporated throughout the research efforts to facilitate and integrate the systems approach to the research. In addition, BRCs should utilize technology development that will facilitate and increase the rate of discovery in the scientific FAs.

CENTER DEVELOPMENT REQUIREMENTS

Infrastructure and Operation. Strategies for development of these BRCs may include renovation of existing buildings and leasing buildings. Awards resulting from this competition may include some part of the first year budget for BRC establishment, in costs to house the BRC (including a possible lease for the first five years of the project), to renovate BRC laboratories as needed, and for research equipment and instrumentation. Award funds may not be used to construct new buildings.

BRCs will be expected to use the **DOE Joint Genome Institute's** (JGI) numerous and various capabilities including DNA genome and RNA transcript sequencing and DNA synthesis for challenging sequencing and analysis projects that best utilize the strengths of the DOE JGI. The BRC program will have available up to 30% of JGI annual capacity. For planning purposes, expect access to up to 12 TB of sequencing service per year per BRC and up to 500 kB of DNA synthesis per year per BRC. Allotments may be adjusted with regard to BRC size and as technologies, efficiencies and budgets change. Data generated by JGI for BRCs will follow the [JGI data release policy](#). See "The DOE Joint Genome Institute (JGI)" paragraph under "Other Considerations" below for more information. BRCs may develop agreements with respect to access to other major DOE scientific instrumentation and user facilities (such as synchrotron and neutron facility stations, and supercomputing) on an as-needed basis rather than as an integral component of the initial BRC request and budget since funding at DOE user facilities is determined and administered separately from this announcement.

Annual operating costs supported by BRC awards are anticipated to be up to \$25 million per year total costs. It is anticipated that the BRCs will be nearing full operations by early fiscal year (FY) 2018, i.e., by January 2018, and that awards will be made for an initial five-year period. Successful applicants will be expected to justify the BRC's annual operating costs.

Technical Capabilities and Instrumentation. BRCs will need to include all technical capabilities the applicant considers necessary to implement their proposed research such as instrumentation for high throughput analytical chemistry; structural biology; benchtop fermentation; the production and characterization of proteins and other required materials; instrumentation for proteomics and metabolomics; instrumentation for the characterization of microbial cells, microbial communities and plants; bioinformatics and computational biology; facilities for plant growth and plant field trials; etc.

In order to carry out their research programs, the BRCs will be expected to develop core capabilities in or have access to the necessary analytical, imaging, structural and computational capabilities requisite for the systems biology approach to specialty biofuels and bioproducts production. A portion of the research funds may be devoted to developing new technological capabilities for overcoming challenges in systems biology research that cannot be addressed with currently available technologies and instrumentation. Research capabilities and resources to be accessed outside of the BRC should be clearly identified.

Management. The Department of Energy's Office of Science recognizes that effective management of scientific facilities, programs, and projects is critical to the success of the research and to their overall contribution to the DOE mission. BRCs must have well-designed

management plans for the establishment of the BRC as well as for BRC operations. The plan must address research evaluation, adding research partners and projects, and sunsetting unproductive or completed research. The management plan must address how research findings in one area will inform research directions in other areas. The plan must address management structure, leadership responsibilities and authority, and handling of research misconduct. The plan must demonstrate how early- and mid-career researchers will be incorporated into the management structure and be given opportunities to take on more responsibility and gain management experience within a multidisciplinary, multi-institutional research center. Plans should include provisions for coordination with other BRCs and with other BER-funded research projects. The management plan must also describe change control processes as they may be needed.

In common with other major Office of Science supported programs, the BRCs will be subject to regular and rigorous peer review of their scientific program and their management structure, policies, and practices.

Staffing. The research program of the BRCs should be led by scientists with appropriate and documented expertise. A BRC may be comprised of diverse institutions including DOE/NNSA national laboratories, academic and non-profit research institutes and the private sector.

In assembling their research teams, BRCs 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. BRCs should strive to engage a diverse workforce with regard to gender, race, and ethnicity as numerous studies demonstrate that a diverse workforce is correlated with higher productivity.

Data Management. Applicants must describe strategies that their BRC will use for management of data including data generation, data quality, data standards, data storage and data sharing and how the BRC will integrate the information it develops with that of other Genomic Science Program research projects, as well as with other community reference databases in compliance with The Office of Science statement on Digital Data Management, published at science.energy.gov/funding-opportunities/digital-data-management, which governs applications submitted under this FOA, and is detailed in Part IV of this FOA.

Deliverables / Benchmarks. The BRCs will be conducting fundamental biological research and related technology development. However, the BRCs are expected to have deliverables or benchmarks that help focus the objectives of the research to the proposed short and long-term goals of the BRC. Other deliverables include peer reviewed research articles, invention disclosures, software releases, patent applications as well as an up-to-date, accurate and informative website.

Research Integration and Coordination. Applicants should address how research will be coordinated across the BRC, specifically addressing how research findings in one FA will inform research directions in other FAs. Applicants should describe plans for integrating the results of their fundamental research and technology development with other BRCs and across the Genomic Science Program in general. BRCs may require research and technology capabilities that are beyond the scope of their BRC's skills and resources and they should develop plans for

obtaining these additional capabilities, including collaboration with outside scientists. These may include scientists funded by the Genomic Science Program as well as those outside the Genomic Science Program, and the use of resources both at their home institutions as well as at other institutions. Change control procedures, as they may be needed, also should be described.

Annual Meeting. If a project is funded, beginning in the first year of funding, one or more project participants will be required to attend an annual Genomic Science Program investigator meeting, generally held in the Washington, DC area. Reasonable travel expenses may be included as part of the project budget.

OTHER CONSIDERATIONS

Availability of User Facilities and Other Specialized Resources

DOE has responsibility for programs and facilities that offer unique and complementary resources that support research in biological systems science. Potential applicants are encouraged to leverage these programs/facilities and resources if needed and appropriate. Follow the links provided below for information regarding availability and terms of use.

The DOE Joint Genome Institute (JGI) in Walnut Creek, California provides the scientific community access to state of the art genomic sequencing and analysis capabilities, as well as modest amounts of DNA synthesis capability, for microbial, plant, microbial community, and other (non-human-pathogen) targets. In all cases, the aim of the JGI is to provide to the national and international scientific community information on the genome-derived “parts lists” that support further discovery (www.jgi.doe.gov). These resources are available at no charge through a Center-specific user proposal process (see <http://proposals.jgi-psf.org/>).

The DOE Systems Biology Knowledgebase (KBase) led by Lawrence Berkeley National Laboratory with participation from Argonne, Oak Ridge, and Brookhaven National Laboratories is an open software and data platform designed to meet the grand challenge of systems biology. The KBase platform provides a unified, scalable system that integrates data and analytical tools for comparative functional genomics of microbes, plants, and their communities. KBase promotes data-driven open science and community collaboration accelerating the pace of scientific discovery. KBase aims to provide a knowledgebase with an integrated environment where knowledge and insights are created and multiplied. The KBase resources are freely available at Kbase.us

The Environmental Molecular Sciences Laboratory (EMSL) located at the Pacific Northwest National Laboratory (PNNL), is a BER scientific user facility that provides integrated experimental and computational resources to the user community. Experimental capabilities available include advanced imaging/microscopy, nano SIMS, NMR spectroscopy, computed x-ray tomography, high-resolution mass spectrometry and transcriptomics/proteomics. These capabilities are available at no charge through a user proposal process (see www.emsl.pnl.gov/access).

Light Sources and neutron beam facilities. DOE provides the scientific community access to light sources that are capable of providing structural and chemical information often unavailable with conventional sources of x-rays. DOE laboratories with these user facilities include: Argonne

National Laboratory (www.aps.anl.gov/); Brookhaven National Laboratory (www.bnl.gov/ps/); Lawrence Berkeley National Laboratory (www.als.lbl.gov/); and the SLAC National Accelerator Laboratory (www6.slac.stanford.edu/) and for neutron experiments, Oak Ridge National Laboratory (<http://neutrons.ornl.gov/>). Use of the light sources is available at no charge through a user proposal process.

Section II – AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT

Depending on the nature of the selected lead organization, DOE anticipates awarding either a field work authorization or a cooperative agreement under this FOA. A DOE field work authorization or other appropriate instrument will be awarded to a successful DOE/NNSA National Laboratory Contractor. A cooperative agreement will be awarded to any other successful domestic entity including, but not limited to, universities, nonprofit organizations, and for-profit organizations. Participation by non-DOE/NNSA Federal agencies and their non-DOE/NNSA Federally Funded Research and Development Center (FFRDC) contractors, other non-DOE Government Owned/Contractor Operator facility (GOCO) contractors, and non-DOE Government Owned/Government Operated facilities (GOGOs) will be funded under an interagency agreement.

B. ESTIMATED FUNDING

DOE anticipates making multiple awards for a period of five years at a funding level appropriate for the proposed scope, with out-year support contingent on the availability of funds and satisfactory progress toward stated objectives. Total funding of \$89,000,000 annually is expected to be available to support this FOA subject to appropriation of funds by the Congress. DOE is under no obligation to pay for any costs associated with the preparation or submission of an application. DOE reserves the right to fund, in whole or in part, any, all, or none of the applications submitted in response to this FOA.

Funding for all awards and future budget periods is contingent upon the availability of funds appropriated by Congress.

C. MAXIMUM AND MINIMUM AWARD SIZE

DOE anticipates that award sizes will range from \$12,500,000 per year to \$30,000,000 per year in DOE funding. The award sizes will depend on the merit review, the number of meritorious applications, and the availability of appropriated funds.

Ceiling

\$30,000,000 per year

Floor

\$12,500,000 per year

D. EXPECTED NUMBER OF AWARDS

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

E. ANTICIPATED AWARD SIZE

Applications requesting more than \$30 million per year or less than \$12.5 million will be deemed non-responsive to this FOA. DOE anticipates that budgets between \$15 million and \$25 million per year will be sufficient to perform the research anticipated in response to this FOA. Applications requesting funding between \$12.5 million and \$15 million or between \$25 million and \$30 million may be subject to additional scrutiny. Therefore, such applicants should carefully justify all costs and explain how the scope of activity will be managed.

F. PERIOD OF PERFORMANCE

Awards are expected to be made for a five-year project period, consisting of five one-year budget periods.

Continuation funding (funding for the second and subsequent budget periods) is contingent on: (1) availability of funds appropriated by Congress and future year budget authority; (2) progress towards meeting the objectives of the approved application; (3) submission of required reports; and (4) compliance with the terms and conditions of the award.

G. TYPE OF APPLICATION

DOE will accept new applications under this FOA. All awards, including any made to existing Bioenergy Research Centers awardees, will be new awards.

H. VALUE/FUNDING FOR DOE/NNSA NATIONAL LABORATORY CONTRACTORS AND NON-DOE/NNSA FFRDC CONTRACTORS

For cooperative agreement awards, the value of, and funding for, a DOE/NNSA National Laboratory contractor's, a non-DOE/NNSA FFRDC or GOCO contractor's, GOGO's, or another

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

I. RESPONSIBILITY

The successful prime applicant/awardee (lead organization) will be the responsible authority regarding the settlement and satisfaction of all contractual and administrative issues, including but not limited to, disputes and claims arising out of any agreement between the applicant and any team member, and/or subawardee.

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

If an award includes participation with non-DOE/NNSA Federal agencies, or their Federally Funded Research and Development Center (FFRDC) contractors, GOCO contractors, or GOGOs, all Disputes and Claims will be resolved in accordance with the terms and conditions of the interagency agreement in consultation between DOE and the prime awardee.

Section III – ELIGIBILITY INFORMATION

A. ELIGIBLE APPLICANTS

1. INDIVIDUALS

U.S. citizens and lawful permanent residents are not eligible to apply for funding as a prime recipient (lead organization), but are eligible to participate as subawardees (team members).

In addition, individuals with the skills, knowledge, and resources necessary to carry out the proposed research as a Program Director/Principal Investigator are invited to work with their organizations or as a subawardee to develop an application for assistance. Individuals from underrepresented groups as well as individuals with disabilities are always encouraged to apply for assistance.

2. DOMESTIC ENTITIES

For-profit entities, educational institutions, and nonprofits¹ that are incorporated (or otherwise formed) under the laws of a particular State or territory of the United States are eligible to apply for funding as a prime recipient (lead organization) or subawardee (team member).

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

State, local, and tribal government entities are eligible to apply for funding as a subawardee (team member), but are not eligible to apply as a prime recipient (lead organization).

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

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

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

3. FOREIGN ENTITIES

Foreign entities, whether for-profit or otherwise, are eligible to apply for funding as a subawardee (team member), but are not eligible to apply as a prime recipient (lead organization).

4. INCORPORATED CONSORTIA

Incorporated consortia, which may include domestic and/or foreign entities, are eligible to apply for funding as a prime recipient (lead organization) or subawardee (team member). Incorporated consortia must be incorporated (or otherwise formed) under the laws of a State or territory of the United States.

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

5. UNINCORPORATED CONSORTIA

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

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

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

B. COST SHARING

For-profit entities, whether prime recipients (lead organizations) or subawardees (team members), are required to provide a minimum of 20% cost share for both Basic and Applied Research and Development (R&D) activities. This cost share will be based on the portion of the BRC budget proposed by each for-profit entity and must be at least 20% of the total allowable research and development costs of that entity. For all other non-Federal entities, cost sharing is encouraged, but not required. Applicants must include any 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 EAct 2005, Sec. 988.

C. OTHER ELIGIBILITY REQUIREMENTS

Team Arrangements

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

DOE/NNSA National Laboratory Contractors

DOE/NNSA National Laboratory applicants are eligible to apply for funding as the lead organization or team member under this announcement if their cognizant DOE/NNSA Contracting Officer provides written authorization. This authorization should be submitted with the application as part of the Budget for DOE/NNSA National Laboratory Contractor File. (This is not required for the National Energy Technology Laboratory since it is a Government Owned/Government Operated (GOGO.)) Failure to provide the authorization by the time of initial review completion will prevent an otherwise eligible application from being forwarded for merit review. The following wording is acceptable for the authorization:

“Authorization is granted for the _____ Laboratory to participate in the proposed project. The work proposed for the laboratory is consistent with or complementary to the missions of the laboratory and will not adversely impact execution

of the DOE/NNSA assigned programs at the laboratory.”

Non-DOE/NNSA Federal Agencies and their FFRDC Contractors

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

The prime applicant must obtain written authorization for non-DOE/NNSA FFRDC or other GOCO participation. The cognizant Contracting Officer for the Federal agency sponsoring the FFRDC/GOCO contractor must authorize in writing the participation of the FFRDC/GOCO contractor on the proposed project and this authorization should be submitted with the application. Failure to provide the authorization by the time of initial review completion will prevent an otherwise eligible application from being forwarded for merit review. The written authorization must also contain a determination that the use of a FFRDC/GOCO contractor is consistent with the contractor's authority under its award and does not place the FFRDC/GOCO contractor in direct competition with the private sector, in accordance with FAR Part 17.5. The following wording is acceptable for the authorization:

“Authorization is granted for the _____ Laboratory to participate in the proposed project. The work proposed for the laboratory is consistent with or complementary to the missions of the laboratory and will not adversely impact execution of the (insert agency) assigned programs at the laboratory. This laboratory is authorized to perform the work proposed in the application submitted under DOE Funding Opportunity Announcement # DE-FOA-0001540 by the following statutory authority (insert statute name, citation, and section) .”

Pre-applications

Only those applicants that submit a timely pre-application and receive notification from DOE allowing a full application may submit full applications (See Section IV.B below).

Requested Funding Amount:

Applications requesting more than \$30 million per year or less than \$12.5 million per year will be determined non-responsive to this FOA.

Data Management Plan

A Data Management Plan as described in Section IV.C., “CONTENT AND APPLICATION FORMS”, Appendix 6, is required. Applications that do not have a Data Management Plan will be determined nonresponsive and will be not reviewed.

Performance of Work in the United States

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

This requirement does not apply to travel or to equipment, materials and supply purchases. Like all proposed costs, proposed travel, equipment, and material and supply costs will be evaluated to determine whether they are necessary and appropriate for the conduct of the effort.

Furthermore, it is the sense of the Congress that, to the greatest extent practicable, all equipment and products purchased with funds made available under awards resulting from this FOA should be American-made.

Work funded as a subaward from the prime recipient may be performed outside of the United States by a foreign entity.

Applicants may request a waiver of this requirement. To do so, applicants must include a written waiver request in the full application. DOE in its sole discretion may waive this requirement if it determines that it will further the purposes of this FOA and is otherwise in the interests of DOE. See Section IV.C.6 of the FOA for waiver request information.

Section IV – APPLICATION AND SUBMISSION INFORMATION

A. ADDRESS TO REQUEST APPLICATION PACKAGE

Application forms and instructions are available at Grants.gov. To access these materials, go to <http://www.grants.gov>, select “Apply for Grants”, and then select “Download Application Package.” Enter the CFDA number (81.049) and/or the funding opportunity number (DE-FOA-0001540) shown on the cover of this FOA and then follow the prompts to download the application package.

Applications must be submitted through Grants.gov. Applications submitted through www.FedConnect.net will not be accepted.

B. LETTER OF INTENT AND PRE-APPLICATION

1. Letter of Intent

Not Applicable

2. Pre-application

A pre-application is required, and must be submitted via PAMS. Pre-applications submitted outside PAMS will not be considered. Pre-applications may not be submitted through grants.gov or www.FedConnect.net. Detailed instructions for registering in PAMS and submitting pre-applications are provided below.

PRE-APPLICATION DUE DATE

06/17/2016 at 5:00 PM Eastern Time

ALLOW/DISALLOW DATE:

07/01/2016

Pre-applications will be reviewed for responsiveness of the proposed work to the research topics identified in this FOA. DOE will send a response by email to each applicant allowing or

disallowing the submission of a full application by 07/01/2016. Applicants who have not received a response regarding the status of their pre-application by this date are responsible for contacting the program to confirm this status.

Only those applicants that receive notification from DOE allowing a full application may submit full applications. No other full applications will be considered.

The pre-application attachment should include, at the top of the first page, the following information:

Title of Pre-application
Principal Investigator Name, Job Title
Institution
PI Phone Number, PI Email Address
Funding Opportunity Announcement Number: DE-FOA-0001540

This information must be followed by a clear and concise description of the objectives and technical approach of the proposed research. The pre-application may not exceed ten pages, with a minimum text font size of 11 point and margins no smaller than one inch on all sides. Figures and references, if included, must fit within the ten-page limit.

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

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

Provide a list of the names and institutional affiliations of all participating investigators, including collaborators and consultants on the proposed project, using the following format:

Senior/Key Personnel			Institution/Organization (Please spell out)
Last_Name	First_Name	Title	Institution_Name

Table 2: Potential Conflicts of Interest or Bias (COI) in Selection of Reviewers:

For each funded investigator proposed, provide a list of co-investigators, co-authors, or collaborators of the past 48 months, co-editors of the past 24 months, graduate and postdoctoral

advisors/advisees, and close associations. Provide this information in table form first created in an Excel file before conversion to PDF for submission, using the following format. For the type of COI, use the code 1 = Co-investigator, co-author or collaborator, 2 =co-editors, 3 = advisor/advisee, 4= close associate. For multiple types of COI, separate with a comma.

Funded Investigator: Smith, John			
Last_Name	First_Name	Institution/Organization (Please spell out)	Type of COI
Wilson	Sarah	University of California, Berkeley	1, 3
Jones	Edward	University of Pennsylvania	2

Pre-applications will be used to help the Office of Science begin planning for the full application peer review process. The intent of the Office of Science in disallowing submission of certain full applications is to save the time and effort of applicants in preparing and submitting full applications not responsive to this funding opportunity announcement.

The Principal Investigator will be automatically notified when a full pre-application is allowed or disallowed in response to the pre-application. The DOE Office of Science Portfolio Analysis and Management System (PAMS) will send an email to the Principal Investigator from PAMS.Autoreply@science.doe.gov, and the status of the pre-application will be updated at the PAMS website <https://pamspublic.science.energy.gov/>. Notifications are sent as soon as the decisions to allow or disallow are finalized.

It is important that the pre-application be a single file with extension .pdf, .docx, or .doc. The filename should not exceed 50 characters. The pre-application must be submitted electronically through the DOE Office of Science Portfolio Analysis and Management System (PAMS) website <https://pamspublic.science.energy.gov/>. The Principal Investigator and anyone submitting on behalf of the Principal Investigator must register for an account in PAMS before it will be possible to submit a pre-application. All PIs and those submitting pre-applications on behalf of PIs are encouraged to establish PAMS accounts as soon as possible to avoid submission delays.

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

Registering to PAMS is a two-step process; once you create an individual account, you must associate yourself with (“register to”) your institution. Detailed steps for registering in PAM are contained in Section IV.H.4, but are repeated below for convenience, followed by specific instruction for submitting pre-applications via PAMS.

Create PAMS Account:

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

- Click the “No, I have never had an account” link and then the “Create Account” button.
- You will be prompted to enter your name and email address, create a username and password, and select a security question and answer. Once you have done this, click the “Save and Continue” button.
- On the next page, enter the required information (at least one phone number and your mailing address) and any optional information you wish to provide (e.g., FAX number, website, mailstop code, additional email addresses or phone numbers, Division/Department). Click the “Create Account” button.
- Read the user agreement and click the “Accept” button to indicate that you understand your responsibilities and agree to comply with the rules of behavior for PAMS.

PAMS will take you to the “Having Trouble Logging In?” page. (If you have been an Office of Science merit reviewer or if you have previously submitted an application, you may already be linked to an institution in PAMS. If this happens, you will be taken to the PAMS home page.

Register to Your Institution:

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

Submit Your Pre-Application:

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

You are encouraged to register for an account in PAMS at least a week in advance of the preproposal submission deadline so that there will be no delays with your submission.

For help with PAMS, click the “External User Guide” link on the PAMS website, <https://pamspublic.science.energy.gov/>. You may also contact the PAMS Help Desk, which can

be reached Monday through Friday, 9 AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, email: sc.pams-helpdesk@science.doe.gov. All submission and inquiries about this Funding Opportunity Announcement should reference **DE-FOA-0001540**.

C. CONTENT AND APPLICATION FORMS

APPLICATION PREPARATION

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

You are required to use the compatible version of Adobe Reader software to complete a [Grants.gov](#) Adobe application package. To ensure you have the [Grants.gov](#) compatible version of Adobe Reader, visit the download software page at http://www.grants.gov/help/download_software.jsp.

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. Attached PDF files must be plain files consisting of text, numbers, and images without editable fields, signatures, passwords, redactions, or other advanced features available in some PDF-compatible software. Do not use PDF portfolios or binders.

Please note: you may only use the following UTF-8 characters when naming your application attachments: A-Z, a-z, 0-9, underscore (_), hyphen (-), space, period. You must limit the file name to 50 or fewer characters. Attachments that do not follow this rule may cause the entire application to be rejected or cause issues during processing.

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

Letters of Recommendation: Letters of recommendation are discouraged and will not be reviewed by DOE.

1. SF-424 (R&R)

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

DUNS AND EIN NUMBERS (FIELDS 5 AND 6)

The DUNS and EIN number fields on the SF-424 (R&R) form are used in PAMS to confirm the identity of the individual or organization submitting an application.

- Enter each number as a nine-digit number.
- Do not use hyphens or dashes.
- The Office of Science does not use the twelve-digit EIN format required by some other agencies.

TYPE OF APPLICATION (FIELD 8)

All applications submitted will be considered **new** applications, and should be identified as such.

The Office of Science does not make use of the Continuation or Revision options.

Please answer “yes” to the question “Is this application being submitted to other agencies?” if substantially similar, identical, or closely related research objectives are being submitted to another Federal agency. Indicate the agency or agencies to which the similar objectives have been submitted.

PUBLIC POLICY REQUIREMENTS

The applicant assures DOE of its compliance with applicable public policy requirements, including the following: The National Policy Assurances To Be Incorporated As Award Terms are located at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms> under Award Terms.

2. Research and Related Other Project Information

Complete questions 1 through 6 and attach files.

Note concerning question 4.a. and 4.b.

If any environmental impact, positive or negative, is anticipated, indicate “yes” in response to question 4.a., “potential impact – positive or negative - on the environment.” Disclosure of the impact should be provided in response to question 4.b. First indicate whether the impact is positive or negative and then identify the area of concern (e.g., air, water, exposure to radiation, etc.).

DOE understands the phrase in field 4.a., “potential impact ... *negative*” to apply if the work described in the application could potentially have any of the impacts listed in (1) through (5) of 10 CFR 1021, Appendix B, Conditions that Are Integral Elements of the Classes of Action. (<http://www.ecfr.gov>)

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

Lastly, if there will be 1) extraordinary circumstances (i.e., scientific or public controversy) related to the significance of environmental effects (10 CFR 1021.410 (b)(2)), 2) if the work is connected to other actions with potentially significant impacts (10 CFR 1021.410 (b)(3)), or 3) if the work is related to other nearby actions with the potential for cumulatively significant impacts (10 CFR 1021.410 (b)(3)), applicants should indicate a “negative” impact on the environment.

The files must comply with the following instructions:

PROJECT SUMMARY/ABSTRACT (FIELD 7 ON THE FORM)

The project summary/abstract is a summary of the proposed activity suitable for distribution to the public and sufficient to permit potential reviewers to identify conflicts of interest. It must be a self-contained document. Provide the name of the applicant, the project title, the project director/principal investigator(s) (PD/PI) and the PD/PI's institutional affiliation, any coinvestigators and their institutional affiliations, the objectives of the project, a description of the project, including methods to be employed, and the potential impact of the project (i.e., benefits, outcomes). A sample is provided below:

<p>A Really Great Idea</p> <p>A. Smith, Lead Institution (Principal Investigator)</p> <p>A. Brown, Institution 2 (Co-Investigator)</p> <p>A. Jones, Institution 3 (Co-Investigator)</p> <p>Text of abstract</p>

The project summary must not exceed 1 page when printed using standard 8.5” by 11” paper with 1” margins (top, bottom, left and right) with font not smaller than 11 point. To attach a Project Summary/Abstract, click “Add Attachment.”

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

DOE COVER PAGE

(PART OF PROJECT NARRATIVE ATTACHED TO FIELD 8 ON THE FORM)

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

- The project title
- Applicant/Institution:
- Street Address/City/State/Zip:

- Postal Address:
- Lead PI name, telephone number, email:
- Administrative Point of Contact name, telephone number, email:
- Funding Opportunity FOA Number: DE-FOA-0001540
- DOE/Office of Science Program Office: Office of Biological and Environmental Research
- DOE/Office of Science Program Office Technical Contact: N. Kent Peters, 301-903-5549, kent.peters@science.doe.gov
- DOE Award Number (if applicant is an existing Bioenergy Research Center awardee):
- PAMS pre-application tracking number:
- Research Focus area or areas as identified in Section I of this FOA - **Identify which of the following the focus areas being addressed by the application:**
 - (1) Sustainability,
 - (2) Feedstock Development,
 - (3) Deconstruction and Separation, and
 - (4) Conversion

COVER PAGE SUPPLEMENT

(PART OF PROJECT NARRATIVE ATTACHED TO FIELD 8 ON THE FORM)

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

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

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

** Applicants are strongly encouraged to follow the exact format of the sample table above since the tabular information will be compiled across all applications. This includes the following elements:

- Include grid lines around each cell.
- Do not merge name or institution cells, even if individuals share the same institution.
- Do not change the order of the columns.
- Do not include any additional information (e.g. “PI”, “Co-PI”, or footnote symbols) under “Last Name” and “First Name”.
- Do not include departmental affiliations under Institutions.
- If an individual has a joint appointment, separate the institutions with a “/” (i.e. “Univ of X / National Lab Y”).

Table 2: Summary budget information for all partner institutions

Institution Name	Year 1 Budget	Year 2 Budget	Year 3 Budget	Year 4 Budget	Year 5 Budget	Total Budget
Total Budget						

** Provide the total costs (\$ in thousands) of the budget request in each year for each institution and totals for all rows and columns. For any for-profit entities, whether prime recipients (lead organizations) or subawardees (team members), for which cost sharing is required in accordance with Section III. B, include 2 separate lines: the first for the proposed DOE-funded budget amount and the second for proposed cost-share amount. The sum of all lines should equal the “Total Budget” amount.

PROJECT NARRATIVE (FIELD 8 ON THE FORM)

The project narrative **must not exceed 75 pages** of technical information, including charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard 8.5” by 11” paper with 1 inch margins (top, bottom, left, and right). The font must not be smaller than 11 point. Merit reviewers will only consider the first 75 pages of the project narrative. This page limit does not apply to the Cover Page, any Table of Contents (optional, but if included, should be limited to one page), Budget Page(s), Budget Justification, biographical material, publications and references, and appendices, each of which may have its own page limit.

Headers/footers containing page numbers and project titles/logos may be inserted within the required 1” margins.

Do not include any Internet addresses (URLs) that provide supplementary or additional information that constitutes a part of the application. Merit reviewers are not required to access Internet sites; however, Internet publications in a list of references will be treated identically to print publications. See Part VIII.D for instructions on how to mark proprietary application information. To attach a Project Narrative, click “Add Attachment.”

The contents of the project narrative are specified in order to ensure that the merit reviewers have the necessary information to conduct proper evaluations. All project narratives are to use the following outline.

- I. Overview of the Project Plan. This section must not exceed five pages and should provide a clear, substantive overview summarizing the vision for the proposed Center including:
 - Background/Introduction: Explanation of the importance and relevance of the proposed

- work as well as a review of the relevant literature;
- Clearly stated short , and long term goals of the Center;
- How the research program will address needs/gaps in bioenergy research.
- How the various research components will be integrated; and
- The strategy for developing and operating the Center;

II. Research and Development Program. Applicants should provide detailed information on their plans for:

- Proposed research objectives and research programs designed to provide science that is in the forefront in the area of bioenergy research during the project period. This section should provide a clear, concise statement of the specific objectives/aims of the proposed project;
- Proposed deliverables and benchmarks, including an explanation as to how the deliverables and benchmarks will ensure that research remains focused on the proposed short and long term goals and the approach to measuring performance against the stated benchmarks;
- Potential scientific and technical obstacles to achieving the research objectives during the initial project period and approaches to be used to overcome them;
- Proposed approach to shifting research directions in response to promising developments;
- How the proposed research will contribute to reaching the goals of the DOE Bioenergy program;
- How the proposed Center relates to existing and planned research programs at the host institution;
- Development and operation of the proposed Center;
- Plans for external collaborations and partnerships including DOE user facility collaborations, if applicable;
- Proposed access to existing research space and instrumentation and facilities at the host institution and its partners;
- Access to analytical, imaging, structural and computational capabilities for the systems approach to biofuels production including access to research capabilities and resources outside of the Center;
- Performance monitoring systems to be utilized to ensure the Center is established within the proposed scope, cost and schedule; and
- A project timetable, outlining as a function of time, year by year, all the major activities or phases of the proposed Center. The successful applicant must use this project timetable to report progress.

III. Organization and Staffing Plan. Applicants should provide information on their plans for:

- Management of the Center, including a well-designed management plan describing the proposed project management of the establishment and operation of the Center. The plan must address research evaluation, adding research partners and projects, and sunsetting unproductive or completed research. The management plan must address how research

findings in one area will inform research directions in other areas. The plan must address management structure, leadership responsibilities and authority, and handling of research misconduct. The plan must demonstrate how early- and mid-career researchers will be incorporated into the management structure and be given opportunities to take on more responsibility and gain management experience within a multidisciplinary, multi-institutional research center. Plans should include provisions for coordination with other BRCs and with other BER-funded research projects. The management plan must also describe change control processes as they may be needed;

- Overview of the scientific and technical expertise in the relevant research disciplines required for the Center;
- Relevant scientific and technical expertise and experience of key personnel in the research disciplines needed for project success;
- Relevant scientific and technical expertise and experience of the proposed Center staff in the research disciplines needed for project success including any plans for collaboration with outside scientists;
- Organizational structure: roles and responsibilities of key personnel and means of providing external oversight and guidance for scientific and technical direction and approval of the research program;
- Relevant experience of key personnel in project, program, and personnel management for projects of comparable magnitude and of diverse teams of science and technical professionals;
- Major needs and recruiting strategy for additional scientific and technical personnel including new senior staff;
- Availability of the Project Director and key personnel, including the analysis of their potential involvement in other major projects and a discussion of their current and potential future time commitments; and
- Other issues related to organization and staffing, if any.

IV. Quality Assurance and Information Management Plan. Applicants should provide information on their plans for:

- Quality assurance systems and plans to be implemented within the Center including national and international standards for quality assurance for the different categories of experimentation to be carried out in the Center and plans for qualifying for ISO and other certifications;
- Planned approach to data management including data generation, data quality, data standards, data storage, data sharing and the organization of data systems for the proposed Center;
- Integration of information developed through the Center's activities with information management systems of the Genomic Sciences program such as KBase and JGI as well as with other community reference databases;
- Contribution to, participation with, and adherence to the DOE's data management and data sharing plan; and
- Other issues related to informatics, if any.

The Project Narrative comprises the research plan for the project. It should contain enough background material, including review of the relevant literature, to demonstrate sufficient knowledge of the state of the science. There should be no ambiguity about which personnel will perform particular parts of the project, and the time at which these activities will take place.

APPENDIX 1: BIOGRAPHICAL SKETCH

Provide a biographical sketch for the project director/principal investigator (PD/PI) 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 biographical information (curriculum vitae) for each person must not exceed three pages when printed on 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right) with font not smaller than Times New Roman 12 point and must include the following information:

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

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

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

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

Letters of Commitment from Key Personnel and Team Members: Letters of commitment signed by key personnel, including their level of time commitment to the project, should be included in this section. In addition, letters of commitment are required from each organization participating as a team member. Letters of commitment from organizations participating as team members must be signed by the person authorized to commit the organization to a legally binding agreement. Multiple key personnel representing the same institution may sign the same letter of commitment, as applicable. Each letter of commitment is limited to one page.

Personally Identifiable Information: Do not include sensitive personally identifiable information such as a Social Security Number, date of birth, or city of birth. Do not include information that a merit reviewer should not make use of.

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

APPENDIX 2: CURRENT AND PENDING SUPPORT

Provide a list of all current and pending support (both Federal and non-Federal) for the Project Director/Principal Investigator(s) (PD/PI) and senior/key persons, including subawardees, for ongoing projects and pending applications.

List all sponsored activities or awards requiring a measurable commitment of effort, whether paid or unpaid.

For every activity, list the following items:

1. The sponsor of the activity or the source of funding
2. Whether the activity is currently funded or pending
3. The award or other identifying number
4. The title of the award or activity
5. The total cost or value of the award or activity, including direct and indirect costs. For pending proposals, provide the total amount of requested funding.
6. The person-months of effort per year being dedicated to the award or activity

A brief description of how the funded/requested research differs from this application

Concurrent submission of an application to other organizations for simultaneous consideration will not prejudice its review.

- Provide “Current and Pending Support” as Appendix 2 to the project narrative within the same file. Do not attach a separate file.
- This appendix will not count in the project narrative page limitation.

APPENDIX 3: BIBLIOGRAPHY & REFERENCES CITED

Provide a bibliography of any references cited in the Project Narrative. Each reference must include the names of all authors (in the same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers, and year of publication. For research areas where there are routinely more than ten coauthors of archival publications, you may use an abbreviated style such as the Physical Review Letters (PRL) convention for citations (listing only the first author). For example, your paper may be listed as, “A Really Important New Result,” A. Aardvark et. al. (MONGO Collaboration), PRL 999. Include only

bibliographic citations. Applicants should be especially careful to follow scholarly practices in providing citations for source materials relied upon when preparing any section of the application. Provide the Bibliography and References Cited information as an appendix to your project narrative.

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

APPENDIX 4: FACILITIES & 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 will be available to the project. For proposed investigations requiring access to experimental user facilities maintained by institutions other than the applicant, please provide a document from the facility manager confirming that the researchers will have access to the facility. Please provide the Facility and Other Resource information as an appendix to your project narrative.

Discuss the plans for locating the proposed Center. This includes identification of the site or sites where the major activities of the Center 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 Center. 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.

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

APPENDIX 5: EQUIPMENT

List major items of equipment already available for this project and, if appropriate identify location and pertinent capabilities. Provide the Equipment information as an appendix to your project narrative.

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

APPENDIX 6: DATA MANAGEMENT PLAN

Provide a Data Management Plan (DMP) that addresses the following requirements:

1. DMPs should describe whether and how data generated in the course of the proposed research will be shared and preserved. If the plan is not to share and/or preserve certain data, then the plan must explain the basis of the decision (for example, cost/benefit considerations, other parameters of feasibility, scientific appropriateness, or limitations discussed in #4). At a minimum, DMPs must describe how data sharing and preservation will enable validation of results, or how results could be validated if data are not shared or preserved.
2. DMPs should provide a plan for making all research data displayed in publications resulting from the proposed research open, machine-readable, and digitally accessible to the public at the time of publication. This includes data that are displayed in charts, figures, images, etc. In addition, the underlying digital research data used to generate the displayed data should be made as accessible as possible to the public in accordance with the principles stated in the Office of Science Statement on Digital Data Management (<http://science.energy.gov/funding-opportunities/digital-data-management/>). This requirement could be met by including the data as supplementary information to the published article, or through other means. The published article should indicate how these data can be accessed.
3. DMPs should consult and reference available information about data management resources to be used in the course of the proposed research. In particular, DMPs that explicitly or implicitly commit data management resources at a facility beyond what is conventionally made available to approved users should be accompanied by written approval from that facility. In determining the resources available for data management at Office of Science User Facilities, researchers should consult the published description of data management resources and practices at that facility and reference it in the DMP. Information about other Office of Science facilities can be found in the additional guidance from the sponsoring program.
4. DMPs must protect confidentiality, personal privacy, Personally Identifiable Information, and U.S. national, homeland, and economic security; recognize proprietary interests, business confidential information, and intellectual property rights; avoid significant negative impact on innovation, and U.S. competitiveness; and otherwise be consistent with all applicable laws, and regulations. There is no requirement to share proprietary data.

DMPs will be reviewed as part of the overall Office of Science research proposal merit review process. Applicants are encouraged to consult the Office of Science website for further information and suggestions for how to structure a DMP: <http://science.energy.gov/funding-opportunities/digital-data-management/>

- This appendix should not exceed 10 pages including charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard 8.5” by 11” paper with 1 inch margins (top, bottom, left, and right)
- Provide “DATA MANAGEMENT PLAN” as Appendix 6 to the project narrative within the same file. Do not attach a separate file.
- This appendix will not count in the Project Narrative page limitation.

APPENDIX 7: FUNDING PLAN

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

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

APPENDIX 8: ENVIRONMENT, SAFETY AND HEALTH (ES&H) AND SECURITY APPROACHES

Provide information on:

1. The approach for handling environment, safety and health, and security considerations during the work planning and control process and assuring environmental compliance during Center research and development activities; and
 2. Procedures for ensuring security, including access to data stored on Center computers.
- Provide “ENVIRONMENT, SAFETY AND HEALTH (ES&H) AND SECURITY APPROACHES” as Appendix 8 to the Project Narrative within the same file. Do not attach a separate file.
 - This appendix will not count in the Project Narrative page limitation.

APPENDIX 9: INTELLECTUAL PROPERTY (IP) MANAGEMENT PLAN

Provide within the application an IP Management Plan (current or updated) that ensures and facilitates compliance with Federal IP laws and policies, the public interest regarding dissemination of scientific reports/results, and the rapid transfer of technology in the topical area of the Center. The plan should address title to inventions and other IP among the Center members. The statutes and policies governing disposition of title to new inventions under Government agreements will be as follows:

- The Bayh-Dole Act, 35 U.S.C. 200 et seq., requires that universities, nonprofits and small businesses who are participating under a funding agreement will have the option to retain title to their own employees’ inventions;

- 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 CFR Part 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.;
- Inventions made by employees of an FFRDC will be subject to the M&O or other federal contract terms and conditions with respect to ownership of inventions made by lab employees; and
- The agreement will provide the capability for the Center to license other forms of IP such as copyright in software and bailment of biological materials.

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

The IP Management Plan must be approved by DOE Field Patent Counsel before formal implementation.

- Provide “INTELLECTUAL PROPERTY MANAGEMENT PLAN” as Appendix 9 to the Project Narrative within the same file. Do not attach a separate file.
- This appendix will not count in the Project Narrative page limitation.

APPENDIX 10: POTENTIAL CONFLICTS OF INTEREST OR BIAS (COI)

The purpose of this appendix is to help DOE identify any potential conflict of interest or bias (COI) in the selection of reviewers. For each funded investigator proposed, provide the following:

- **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 the funded investigator on a research project, book or book article, report, abstract, or paper during the 48 months preceding the submission of this application. For publications or collaborations with more than 10 authors or participants, only list those individuals in the core group with whom the Principal Investigator interacted on a regular basis while the research was being done. Also, list any individuals who are currently, or have been, co-editors with the funded investigator on a special issue of a journal, compendium, or conference proceedings during the 24 months preceding the 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 the funded investigator’s graduate advisor(s) and principal postdoctoral sponsor(s). Also, list the names and current organizational affiliations of the

funded investigator’s graduate students and postdoctoral associates.

- **Close Associations:** List the names of any other persons with whom the funded investigator has a close association in fields related to the proposed research that might present a conflict of interest or bias.

Provide this information in table form first created in an Excel file before conversion to PDF for submission, using the following format. For the type of COI, use the code 1 = Co-investigator, co-author or collaborator, 2 =co-editors, 3 = advisor/advisee, 4= close associate. For multiple types of COI, separate with a comma.

Funded Investigator: Smith, John			
Last_Name	First_Name	Institution/Organization (Please spell out)	Type of COI
Wilson	Sarah	University of California, Berkeley	1, 3
Jones	Edward	University of Pennsylvania	2

- Provide “POTENTIAL CONFLICTS OF INTEREST OR BIAS” as Appendix 10 to the project narrative within the same file. Do not attach a separate file.
- This appendix will not count in the Project Narrative page limitation.

APPENDIX 11: OTHER ATTACHMENT

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

- Provide “OTHER ATTACHMENT” as Appendix 11 to the project narrative within the same file. Do not attach a separate file.
- This appendix will not count in the Project Narrative page limitation.

ADDITIONAL NOTES ABOUT APPENDICES:

- **Do not attach any of the requested appendices described above as files for fields 9, 10, 11, and 12.**

3. Research And Related Budget

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

Cost Share: Any proposed cost share, whether required or voluntary, cannot be included on the budget form itself but must be included in the budget justification. If cost share is proposed, please include a separate section in the budget justification labeled “Cost Share” and include details of the proposed costs share with the same level of detail that is required for DOE-funded items in the budget form. At a minimum, for each budget year, identify the budget categories for which cost share is proposed, the dollar amount of cost share per category, and information supporting the amount.

Note: If the prime applicant (lead organization) is a DOE/NNSA National Laboratory Contractor, the applicant must also provide the information requested in the paragraph entitled “**Budget for DOE/NNSA National Laboratory Contractor, if applicable**” under 4. R&R Subaward Budget Attachment(s) Form (page 35 of this FOA).

Budget Fields

Section A Senior/Key Person	For each Senior/Key Person, enter the requested information. List personnel, base salary, the number of months that person will be allocated to the project, requested salary fringe benefits, and the total funds requested for each person. The requested salary must be the product of the base salary and the effort. Include a written narrative in the budget justification that justifies the need for requested personnel.
Section B Other Personnel	List personnel, the number of months that person will be allocated to the project, requested salary fringe benefits, and the total funds requested for each person. Include a written narrative in the budget justification that fully justifies the need for requested personnel.
Section C Equipment	For the purpose of this budget, equipment is designated as an item of property that has an acquisition cost of \$5,000 or more (unless the organization has established lower levels) and an expected service life of more than one year. (Note that this designation applies for proposal budgeting only and differs from the DOE definition of capital

	equipment.) List each item of equipment separately and justify each in the budget justification section. Do not aggregate items of equipment. Allowable items ordinarily will be limited to research equipment and apparatus not already available for the conduct of the work. General-purpose office equipment is not eligible for support unless primarily or exclusively used in the actual conduct of scientific research.
Section D Travel	For purposes of this section only, travel to Canada or to Mexico is considered domestic travel. In the budget justification, list each trip's destination, dates, estimated costs including transportation and subsistence, number of staff traveling, the purpose of the travel, and how it relates to the project. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). To qualify for support, attendance at meetings or conferences must enhance the investigator's capability to perform the research, plan extensions of it, or disseminate its results. Domestic travel is to be justified separately from foreign travel.
Section E Participant/Trainee Support Costs	If applicable, submit training support costs. Educational projects that intend to support trainees (precollege, college, graduate and post graduate) must list each trainee cost that includes stipend levels and amounts, cost of tuition for each trainee, cost of any travel (provide the same information as needed under the regular travel category), and costs for any related training expenses. Participant costs are those costs associated with conferences, workshops, symposia or institutes and breakout items should indicate the number of participants, cost for each participant, purpose of the conference, dates and places of meetings and any related administrative expenses. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis).
Section F Other Direct Costs	<ul style="list-style-type: none"> • Materials and Supplies: Enter total funds requested for materials and supplies in the appropriate fields. In the budget justification, indicate general categories such as glassware, and chemicals, including an amount for each category (items not identified under "Equipment"). Categories less than \$1,000 are not required to be itemized. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). • Publication Costs: Enter the total publication funds requested. The proposal budget may request funds for the costs of documenting, preparing, publishing or otherwise making available to others the findings and products of the work conducted under the award. In the budget justification, include supporting information. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis).

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

BUDGET JUSTIFICATION (FIELD K ON THE FORM)

Provide the required supporting information for the following costs (See R&R Budget instructions): equipment; domestic and foreign travel; participant/trainees; materials and supplies; publication; consultant services; ADP/computer services; subaward/consortium/contractual; equipment or facility rental/user fees; alterations and renovations; and indirect cost type. Provide any other information you wish to submit to justify your budget request. Any proposed cost share, whether required or voluntary, cannot be included on the budget form itself but must be included in the budget justification. If cost share is proposed, please include a separate section in the budget justification labeled “Cost Share” and include details of the proposed costs share with the same level of detail that is required for DOE-funded items in the budget form. At a minimum, for each budget year, identify the budget categories for which cost share is proposed, the dollar amount of cost share per category, and information supporting the amount. **Attach a single budget justification file for the entire project period in field K.** The file automatically carries over to each budget year.

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

Budgets for Subawardees: You must provide a separate cumulative R&R budget and budget justification for each subawardee, including but not limited to 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). You must complete a separate budget for each year of support requested. The form will generate a cumulative budget for the total project period. Note: For Subawardees expected to perform work falling below the aforementioned threshold, budget and budget explanation information should be provided as a part of the “Budget Justification” document described above. Download the R&R Budget Attachment from the R&R SUBAWARD BUDGET FORM and e-mail it to each subawardee that is required to submit a separate budget. Any proposed cost share, whether required or voluntary, cannot be included on the budget form itself but must be included in the budget justification. If cost share is proposed, please include a separate section in the budget justification labeled “Cost Share” and include details of the proposed costs share with the same level of detail that is required for DOE-funded items in the budget form. At a minimum, for each budget year, identify the budget categories for which cost share is proposed, the dollar amount of cost share per category, and information supporting the amount.

Note: To prevent problems in application submission, it is critical that the subawardee use the actual file that was downloaded from Grants.gov by the prime applicant. After the subawardee has e-mailed its completed budget back to you, attach it to one of the blocks provided on the form. Use up to 10 letters of the subawardee’s name (plus .pdf) as the file name (e.g., ucla.pdf or energyres.pdf). The budget justification(s) for any subawardee(s) should

include the same information supporting each proposed cost that is required of prime awardees in their budget justification, as specified in the table under “Research and Related Budget”, above.

If a subaward is being proposed for a DOE/NNSA National Laboratory Contractor, then the applicant must also submit the appropriate Field Work Proposal and cognizant Federal Contracting Officer authorization as described in “Budget for DOE/NNSA National Laboratory Contractor” below.

If a subaward is being proposed for a non-DOE/NNSA FFRDC or other GOCO contractor, the required authorization by the cognizant Contracting Officer for the Federal sponsoring agency, as required in Section III.B., Other Eligibility Requirements, must be submitted. Use up to 10 letters of the non-DOE/NNSA FFRDC/GOCO contractor name as the file name and attach to the R&R Other Project Information form in Field 12.

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

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

If the project involves more subawardees than there are places in the SUBAWARD BUDGET ATTACHMENT(S) FORM, the additional subaward budgets may be saved as PDF files and appended to the Budget Justification attached to Field K.

Ensure that any files received from subawardees are the PDF files extracted from the SUBAWARD BUDGET ATTACHMENT(S) FORM. Errors will be created if a subawardee sends a prime applicant a budget form that was not extracted from the application package.

5. Project/Performance Site Location(s)

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

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

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

6. Waiver Request- Performance of Work in the United States (If Applicable)

Section III requires that all work by the prime recipient (lead organization) under funding agreements be performed in the United States – i.e., a prime recipient must expend 100% of the total project cost in the United States, except as noted in Section III. C., “*Performance of Work in the United States*”.

To seek a waiver of this requirement, the applicant must submit a waiver request in the full application, which includes the following information: (1) The scope of the work to be performed outside of the United States; (2) The location where the work will be performed; and (3) An explanation for why it is necessary to have the work performed outside of the United States. All waiver requests should explain how the waiver would further the purposes of this FOA and otherwise serve the interests of DOE. The Contracting Officer may require additional information before considering the waiver request. Use “USPerfWaiv” as the file name and attach to the R&R Other Project Information form in Field 12.

7. Summary of Required Forms/Files

Your application must include the following items:

Name of Document	Format	Attach to
SF 424 (R&R)	Form	N/A
RESEARCH AND RELATED Other Project Information	Form	N/A
Project Summary/Abstract	PDF	Field 7
Project Narrative, including required appendices	PDF	Field 8

Cognizant Federal Contracting Officer Approval, if applicable	PDF	Field 12
Waiver Request, if applicable	PDF	Field 12
RESEARCH & RELATED BUDGET	Form	N/A
Budget Justification	PDF	Field K
R&R SUBAWARD BUDGET ATTACHMENT(S) FORM	Form	N/A
Subawardee Budget Justification	PDF	Field K
PROJECT/PERFORMANCE SITE LOCATION(S)	Form	N/A
SF-LLL Disclosure of Lobbying Activities, if applicable	Form	N/A

D. SUBMISSIONS FROM SUCCESSFUL APPLICANTS

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

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

E. SUBMISSION DATES AND TIMES

1. Letter of Intent Due Date

Not Applicable

2. Pre-application Due Date

06/17/2016 at 5:00 PM Eastern Time

You are encouraged to submit your pre-application well before the deadline.

3. Application Due Date

09/30/2016 at 11:59 PM Eastern Time

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

4. Late Submissions

Late submissions of pre-applications and applications will be rejected without further review. DOE may elect to accept a late submission if DOE, in its sole discretion, determines that the applicant was unable to make timely submissions because of DOE/national technological disruptions or significant natural disasters. Other circumstances do not justify late submissions. Unacceptable justifications include, but are not limited to, the following:

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

You are responsible for beginning the submission process in sufficient time to accommodate reasonably foreseeable incidents, contingencies, and disruptions.

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

Requests for late submission are only rarely approved.

F. INTERGOVERNMENTAL REVIEW

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

G. FUNDING RESTRICTIONS

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

Cost Principles: Costs must be allowable, allocable and reasonable in accordance with the

applicable Federal cost principles referenced in 2 CFR 200 as modified by 2 CFR 910 (DOE Financial Assistance Regulation).

Costs for New Construction: Costs for new construction (including new buildings or additions to existing buildings) are not allowable in the BRC award.

Pre-award Costs: Recipients may charge to an award resulting from this FOA 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 2 CFR 200 as modified by 2 CFR 910 (DOE Financial Assistance Regulation). Recipients must obtain the prior approval of the contracting officer for any pre-award costs that are for periods greater than this 90 day calendar period.

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

H. OTHER SUBMISSION AND REGISTRATION REQUIREMENTS

1. Systems to Register In

There are several one-time actions you must complete in order to submit an application in response to this FOA. Applicants not currently registered with SAM, FedConnect, PAMS and Grants.gov should allow **at least 44 days** to complete these requirements. You should start the process as soon as possible. In addition to PAMS and Grants.gov (discussed below), applicants must take the following steps:

- a. **DUNS:** Applicants must obtain a DUNS number at <http://fedgov.dnb.com/webform>.
- b. **SAM:** Applicants must register with the System for Award Management (SAM) at <http://www.sam.gov/>. If you had an active registration in the Central Contractor Registry (CCR), you should have an active registration in SAM. More information about SAM registration for applicants is found at [https://www.sam.gov/sam/transcript/Quick Guide for Grants Registrations v1.7.pdf](https://www.sam.gov/sam/transcript/Quick%20Guide%20for%20Grants%20Registrations%20v1.7.pdf)

Applicants must provide a Taxpayer Identification Number (TIN) to complete their registration in SAM.gov. An applicant's TIN is an Employer Identification Number (EIN) assigned by the Internal Revenue Service (IRS). You may obtain

an EIN from the IRS at <http://www.irs.gov>.

- c. **FedConnect:** Applicants must register with FedConnect at www.fedconnect.net. The full, binding version of assistance agreements will be posted to FedConnect.
- d. **FSRS:** Recipients must register with the Federal Funding Accountability and Transparency Act Subaward Reporting System at <https://www.fsrs.gov>. This registration must be completed before an award may be made. You are advised to register while preparing your application.

2. Registering in Grants.gov

Applicants must register with grants.gov.

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

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

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

For individuals, please follow the procedures detailed below:

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

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

Grants.gov maintains a User Guide at

<http://www.grants.gov/documents/19/18243/GrantsGovApplicantUserGuide.pdf> and a list of Frequently Asked Questions at <http://www.grants.gov/web/grants/applicants/applicant-faqs.html>.

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

FIRST-TIME REGISTRATION PROCESS IN GRANTS.GOV

You must complete the one-time registration process (all steps) before you can submit your first application through www.grants.gov. (See <http://www.grants.gov/web/grants/applicants/grant-application-process.html>). We recommend that you start this process at least six weeks before the

application due date. It may take 44 days or more to complete the entire process. Use the Grants.gov Organizational Registration Checklists at <http://www.grants.gov/web/grants/applicants/organization-registration.html> to guide you through the process. **IMPORTANT:** During the SAM registration process, you will be asked to designate an E-Business Point of Contact (EBIZ POC). The EBIZ POC must obtain a special password called "Marketing Partner Identification Number" (MPIN). When you have completed the process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e., Grants.gov registration).

3. Application Receipt Notices

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

Number 1 - Grants.gov Submission Receipt Number

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

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

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

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

4. Where to Submit an Application

Pre-applications are mandatory and must be submitted through PAMS.

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

Applicants must download the application package, application forms and instructions, from grants.gov at <http://www.grants.gov/>

(Additional instructions are provided in Section IV A of this FOA.)

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.

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

5. DOE Office of Science Portfolio Analysis and Management System (PAMS)

After you submit your application through grants.gov, the application will automatically transfer into the Portfolio Analysis and Management System (PAMS) for processing by the DOE Office of Science. Many functions for grants and cooperative agreements can be done in PAMS, which is available at <https://pamspublic.science.energy.gov>.

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

You must register in PAMS to submit a pre-application or a letter of intent.

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

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

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

1. CREATE PAMS ACCOUNT:

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

- Click the “No, I have never had an account” link and then the “Create Account” button.
- You will be prompted to enter your name and email address, create a username and password, and select a security question and answer. Once you have done this, click the “Save and Continue” button.

- On the next page, enter the required information (at least one phone number and your mailing address) and any optional information you wish to provide (e.g., FAX number, website, mailstop code, additional email addresses or phone numbers, Division/Department). Click the “Create Account” button.
- Read the user agreement and click the “Accept” button to indicate that you understand your responsibilities and agree to comply with the rules of behavior for PAMS.
- PAMS will take you to the “Having Trouble Logging In?” page. (If you have been an Office of Science merit reviewer or if you have previously submitted an application, you may already be linked to an institution in PAMS. If this happens, you will be taken to the PAMS home page.)

2. REGISTER TO YOUR INSTITUTION:

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

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

(toll free) or (301) 903-9610, email: sc.pams-helpdesk@science.doe.gov. All submission and inquiries about this Funding Opportunity Announcement should reference DE-FOA-0001540.

6. Viewing Submitted Applications

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

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

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

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

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

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

1. Log in to PAMS at <https://pamspublic.science.energy.gov/>.
2. Click the "Proposals" tab and click "Access Previously Submitted Grants.gov Proposal."
3. Enter the following information:
 - Proposal ID: Enter the ten-digit PAMS proposal ID, including the leading zeros (e.g., 00002xxxxx). Do not use the grants.gov proposal number. Use the PAMS number previously sent to you in the email with subject line, "Receipt of Proposal"
 - Email (as entered in grants.gov application): Enter your email address as it appears on the SF424(R&R) Cover Page.

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

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

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

The grants.gov proposal will now appear in your list of proposals. Click the “Actions/Views” link in the options column next to this proposal to obtain a dropdown list. Select “Proposal” from the dropdown to see the proposal.

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

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

For help with PAMS, click the “External User Guide” link on the PAMS website, <https://pamspublic.science.energy.gov/>. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9 AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, Email: sc.pams-helpdesk@science.doe.gov. All submission and inquiries about this Funding Opportunity Announcement should reference **DE-FOA-0001540**.

Section V - APPLICATION REVIEW INFORMATION

A. CRITERIA

1. Initial Review Criteria

Prior to a comprehensive merit evaluation, DOE will perform an initial review in accordance with 10 CFR 605.10(b) to determine that (1) the applicant is eligible for the award; (2) the information required by the FOA has been submitted; (3) all mandatory requirements are satisfied; (4) the proposed project is responsive to the objectives of the funding opportunity announcement, and (5) the proposed project is not duplicative of programmatic work.

Failure to provide any information required by the FOA may cause an application to fail the initial review. DOE reserves the right to contact applicants to request the correction of minor omissions if an application is otherwise responsive to the requirements and objectives of the FOA.

Applications that fail to pass the initial review will not be forwarded for merit review and will be eliminated from further consideration.

2. Merit Review Criteria

Applications will be subjected to scientific merit review (peer review) and will be evaluated by Merit Review Panels against the following six criteria, listed in descending order of importance:

- Scientific and/or Technical Merit of the Project;
- Appropriateness of the Proposed Method or Approach;
- Competency of Applicant's Personnel and Adequacy of Proposed Resources;
- Reasonableness and Appropriateness of the Proposed Center Structure and Management Plan;
- Reasonableness and Appropriateness of the Proposed Budget; and
- Environment, Safety and Health and Security Considerations.

The questions below are provided to guide the reviewers; reviewers will not be required to provide written responses to each of them:

a. Scientific and/or technical merit of the project

- Will the Center research programs provide science that is in the forefront in the area of bioenergy and bioproducts research during the project period?
- Is the Research and Development program for the proposed Center well focused on its stated short- 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

- Are the strategy and plan for the development and operation of the proposed Center, 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 research program proposed by the applicant adequately address research needs/gaps in bioenergy and bioproducts, and is the research program likely to contribute to reaching the proposed short- and long-term goals?
- Are the applicant's plans for education, outreach and training in the proposed Center appropriate?
- Are the plans for external collaborations and partnerships reasonable and appropriate?
- Is the plan for quality assurance appropriate for the proposed Center?
- Is the planned approach to data management robust, scalable and appropriate for the mission of the proposed Center and the information management needs of the Genomic Sciences program?

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 Center?
- Is there adequate access to analytical, imaging, structural and computational capabilities to ensure a successful systems biology approach to biofuels and bioproducts production including access to research capabilities and resources outside of the Center?
- Are the applicant's performance monitoring systems adequate to assure Center is established within the scope, cost and schedule of the proposal?
- Do the applicant's key personnel have a proven record of research in the disciplines needed for success in this project?

- Does the proposed Center staff possess adequate experience and expertise in the research disciplines required for project success?
- Do the applicant and the applicant's senior leadership team members for the Center 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 center structure and management plan

- Does the Center structure and management plan provide for results from one scientific focus area to inform research in other focus areas?
- Are there appropriate processes in place to review project progress and adjust research efforts accordingly, i.e. processes to sunset projects and engage new projects? Does the plan ensure continued innovation?
- Does the management plan provide for science administrative opportunities for early- and mid-career scientists?
- Are there appropriate plans for engagement of a scientific advisory board?
- Are there clear procedures for protecting and proactively advancing intellectual property?

e. Reasonableness and appropriateness of the proposed budget

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

f. 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 Center establishment and research and development activities?
- Does the applicant have a strong history of compliance with ES&H requirements?

B. REVIEW AND SELECTION PROCESS

1. Merit Review

Applications that pass the initial review for eligibility and responsiveness to the FOA will be subjected to formal merit review and will be evaluated based on the criteria stated above in Section V.A.2. External peer reviewers are selected with regard to both their scientific expertise and the absence of conflict-of-interest issues. Both Federal and non-Federal reviewers may be used, and submission of an application constitutes agreement that this is acceptable to the investigator(s) and the submitting institution.

DOE may, as part of the merit review process, seek clarifications in writing or schedule meetings between representatives of one or more applicant(s) and members of the merit review panel, in order that the panel members may receive clarifications to their questions about the contents of the most meritorious applications.

2. Selection

Following completion of the merit review, a team of Federal officials will review the applications and the evaluations of the Merit Review Panels, summarize the Merit Review Panel members' independent evaluations of the applications submitted, and recommend the application of the program policy factors, as appropriate. The evaluation process may include consideration of any of the program policy factors listed below.

The Selection Official will consider the findings of the Merit Review Panels and the recommendations of Federal officials, and may consider any of the following program policy factors, in making the selection:

- Diversity of research activities that will lead to new and expanded options for clean, renewable, and carbon-neutral alternatives to fossil fuels;
- Strategy for developing synergies between the Center and existing institutional infrastructure and science;
- Potential to be recognized as an international research Center 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 bioenergy paradigm while demonstrating sound financial stewardship;
- Applicant's approach to intellectual property and technology transfer as described in its IP Management Plan;
- Total amount of DOE funds available.

3. Review of Risk

Pursuant to 2 CFR 200.205, DOE will conduct an additional review of the risk posed by applications submitted under this FOA. Such review of risk will include consideration of:

- Quality of the application,
- Reports and findings from audits performed under 2 CFR 200 or OMB Circular A-133, and
- Systems maintained under 2 CFR 180.

DOE may make use of other publicly available information and the history of an applicant's performance under DOE or other Federal agency awards.

Applicants with no prior performance of DOE awards may be asked to provide information about their financial stability and or their ability to comply with the management standards of 2 CFR 200.

4. Discussions and Award

The Government may enter into discussions with a selected applicant for any reason deemed necessary, including but not limited to the following: (1) 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 2 CFR 200 as modified by 2 CFR 910 (DOE Financial Assistance Regulation); 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

It is anticipated that the award selection will be completed by June of 2017. It is expected that awards will be made in Fiscal Year 2018.

DOE is interested in seeing projects supported under this FOA begin work by 12/01/2017.

Section VI - AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES

1. Notice of Selection

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

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

2. Notice of Award

If a selected prime applicant is not a DOE/NNSA National Laboratory Contractor, an Assistance Agreement issued by the Contracting Officer is the authorizing award document. It normally includes, either as an attachment or by reference, the following items: (1) Special Terms and Conditions; (2) 2 CFR part 200, as amended by 2 CFR part 910, DOE Financial Assistance Regulation, and 10 CFR part 605, the Office of Science Financial Assistance Program; (3) Application as approved by DOE; (4) the Government-wide Research Terms and Conditions, and DOE Agency Specific Requirements; (5) National Policy Assurances To Be Incorporated As Award Terms; (6) Budget and (7) Federal Assistance Reporting Checklist, which identifies the reporting requirements; and (8) Intellectual Property Provisions.

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

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

B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

1. Administrative Requirements

The administrative requirements for DOE grants and cooperative agreements are contained in 2 CFR 200 as modified by 2 CFR 910 (DOE Financial Assistance Regulation).

For grants and cooperative agreements made to universities, non-profits and other entities subject to Title 2 CFR, awards made under this funding opportunity should include the government-wide Research Terms and Conditions. A new version of the Terms and Conditions based on the changes to 2 CFR 200 is not yet available. Once the Terms and Conditions become available, they will be located at <http://www.nsf.gov/bfa/dias/policy/rtc/index.jsp>. If an award is made under this funding opportunity before the Terms and Conditions are posted, alternative Terms and Conditions may be included in the award.

NONDISCLOSURE AND CONFIDENTIALITY AGREEMENTS REPRESENTATIONS (JUNE 2015)

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

(1) It **does not and will not** require its employees or contractors to sign internal nondisclosure or confidentiality agreements or statements prohibiting or otherwise restricting its employees or contractors from lawfully reporting waste, fraud, or abuse to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information.

(2) It **does not and will not** use any Federal funds to implement or enforce any nondisclosure and/or confidentiality policy, form, or agreement it uses unless it contains the following provisions:

a. *“These provisions are consistent with and do not supersede, conflict with, or otherwise alter the employee obligations, rights, or liabilities created by existing statute or Executive order relating to (1) classified information, (2) communications to Congress, (3) the reporting to an Inspector General of a violation of any law, rule, or regulation, or mismanagement, a gross waste of funds, an abuse of authority, or a substantial and specific danger to public health or safety, or (4) any other whistleblower protection. The definitions, requirements, obligations, rights, sanctions, and liabilities created by controlling Executive orders and statutory provisions are incorporated into this agreement and are controlling.”*

b. The limitation above shall not contravene requirements applicable to Standard Form 312, Form 4414, or any other form issued by a Federal department or agency governing the nondisclosure of classified information.

c. Notwithstanding provision listed in paragraph (a), a nondisclosure or confidentiality policy form or agreement that is to be executed by a person connected with the conduct

of an intelligence or intelligence-related activity, other than an employee or officer of the United States Government, may contain provisions appropriate to the particular activity for which such document is to be used. Such form or agreement shall, at a minimum, require that the person will not disclose any classified information received in the course of such activity unless specifically authorized to do so by the United States Government. Such nondisclosure or confidentiality forms shall also make it clear that they do not bar disclosures to Congress, or to an authorized official of an executive agency or the Department of Justice, that are essential to reporting a substantial violation of law.

REGISTRATION REQUIREMENTS

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

SUBAWARD AND EXECUTIVE REPORTING

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

PROHIBITION ON LOBBYING ACTIVITY

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

2. Terms and Conditions

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

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

<http://energy.gov/gc/standard-intellectual-property-ip-provisions-financial-assistance-awards>

3. National Policy Assurances

The National Policy Assurances To Be Incorporated As Award Terms are located at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms> under Award Terms.

4. Statement of Substantial Involvement

A cooperative agreement may be awarded under this FOA. If the award is a cooperative agreement, the DOE contract specialist and DOE project officer will negotiate a Statement of Substantial Involvement with the selected applicant, prior to award, similar to the following sample:

Introduction:

The Department of Energy (DOE) is accountable for the overall results of the DOE funded Bioenergy Research Centers (BRCs) and the expenditure of Federal funds. DOE will maintain an oversight function of the management of the BRCs that includes a variety of BRC activities such as written reports, participation in reviews, accessibility for site visits, attendance at meetings held at DOE-HQ and elsewhere, and for providing information that assists in developing and defending budgets as well as understanding the progress and results against the BRC program mission, goals and objectives.

DOE Technical Direction:

DOE roles and responsibilities include providing technical direction to the Recipient such as: (1) redirect the work effort; (2) shift work emphasis between work areas or tasks; (3) require pursuit of certain lines of inquiry; (4) fill in details or otherwise provide technical

guidance to the Recipient in order to accomplish the tasks and requirements stated in the financial assistance application incorporated into this Agreement. DOE technical direction shall not impose tasks or requirements upon the Recipient additional or different from the tasks and requirements stated in the financial assistance application incorporated into this Agreement. To be valid, technical direction must be issued in writing. Technical direction may not: (1) constitute an assignment of additional work outside the tasks and requirements stated in the financial assistance application incorporated into this agreement; (2) in any manner cause an increase or decrease in the total estimated project cost or the time required for project performance; (3) change any of the expressed terms and conditions of the Agreement; or (4) accept non-conforming work.

DOE will actively monitor the Recipient's research and development activities and actively collaborate with the Recipient in evaluating and setting research milestones.

As part of the DOE substantial involvement for this award, DOE will perform the following specific functions:

- 1) Implement the DOE Management Plan for the DOE BRCs describing the roles and responsibilities of DOE and the BRCs.
- 2) Participate in the development, review and approval of proposed research and development activities and related goals and objectives prior to the commencement of such activities
- 3) Provide technical assistance if requested by the Recipient
- 4) Actively monitor all phases of the BRCs research and development activities
- 5) Conduct performance reviews of BRC research and development activities on an annual basis to determine whether research results satisfy the BRC's stated goals and objectives
- 6) Determine DOE funding levels based on the results of annual performance reviews or other BRC program considerations
- 7) Provide direction and/or re-direction of work based on performance or the results of other related programs
- 8) Issue direction to cease research and development activities based on performance or other programmatic considerations
- 9) Request federal funding for the BRC program and defend the BRC program budget
- 10) Maintain responsibility and accountability for the BRC program including the achievement of the BRC mission, goals, and objectives
- 11) Provide periodic performance evaluations of the BRC operations including the technical, business/administrative efforts
- 12) Conduct and/or review technical, financial, performance, and audit reviews and reports identifying needed actions to correct problems/issues and ensuring that problems/issues are corrected

- 13) Identify and provide technical assistance to correct deficiencies in project or financial performance when reports or monitoring indicates some problems/issues
- 14) Perform site visits requiring BRC participation
- 15) Review performance to ensure that the objectives, terms, and conditions of the award are accomplished
- 16) Provide general administrative requirements, such as identifying required prior approvals

Recipient Roles and Responsibilities:

The BRC shall provide all personnel, facilities, equipment, supplies and services, and otherwise take all action necessary for, or incident to, conducting the research activities. The BRC is responsible for the overall management of the effort necessary for timely and professional execution of the project. The Recipient shall proceed promptly with the performance of technical directions duly issued by the DOE Project Officer in the manner described in the DOE Technical Direction section above, and which are within the DOE Project Officer's authority. The Recipient shall immediately cease performance of any technical direction upon receipt of a written instruction to that effect from the Contracting Officer. If, in the opinion of the Recipient, any technical direction issued by the DOE Project Officer is not within the authorities defined in DOE Technical Direction section above, the Recipient shall not proceed but shall notify the Contracting Officer in writing within five working days after the receipt of any such technical direction and shall request the Contracting Officer to rescind such direction or mutually agree to modify the agreement accordingly. The Contracting Officer shall have the authority to make the final determination with respect to technical direction. If the Recipient disputes the determination and cannot informally resolve the dispute with DOE, the Recipient shall follow the procedures set forth in 2 CFR 910.12. The only persons authorized to give Technical direction to the Recipient under this Agreement are the Contracting Officer and any DOE Project Officer as listed in Block 15 of the Assistance Agreement. Any action taken by the Recipient in response to any direction given by any person other than the Contracting Officer or DOE Project Officer shall not be binding upon the Government.

In addition, the BRC will perform the following duties and responsibilities as described in the DOE Management Plan for the DOE BRC Program.

- 1) Prepare a revised BRC Management Plan, which identifies short, intermediate and long-term goals for the Center. The Plan should address required Quality Assurance (QA) Program/other certification implementation
- 2) Organize and staff the Center to achieve Center goals and objectives
- 3) Develop partnering agreements to ensure that roles, responsibilities, authorities

and accountabilities of the partners are defined and hold partners responsible for assigned work

- 4) Establish an internal review/peer review system to assess progress towards meeting Center goals and objectives
- 5) Establish annual work plans for technical work scope, cost and schedules
- 6) Establish a system for approving changes in Center work plans
- 7) Provide reports to the Office of Science Office of Biological and Environmental Research (SC BER)
- 8) Participate in periodic reviews conducted by SC BER; where significant issues are identified work with SC BER to revise the program or to take corrective actions
- 9) Develop an internal performance monitoring system to track progress and results
- 10) Meet the scope, cost, and schedules within the annual planning documents
- 11) Work with the BER Project Officer to make appropriate changes in the approved BRC Program
- 12) Prepare annual budget submissions in future years and provide requested information to assist SC BER in defending Congressional Budget requests
- 13) Meet requirements in the Agreement including, but not limited to, Intellectual Property and Conflict of Interest requirements
- 14) Ensure the successful implementation of the Center ES&H and Security Programs

Duration of Substantial Involvement

The substantial involvement by DOE under this Agreement will remain in effect for the term of the Agreement, unless otherwise amended.

This statement of substantial involvement does not increase DOE's liability under this Agreement.

End of Statement of Substantial Involvement Sample

5. Additional Conditions

CONFERENCE SPENDING (FEBRUARY 2015)

The recipient shall not expend any funds on a conference not directly and programmatically related to the purpose for which the grant or cooperative agreement was awarded that would defray the cost to the United States Government of a conference held by any Executive branch department, agency, board, commission, or office for which the cost to the United States Government would otherwise exceed \$20,000, thereby circumventing the required notification by the head of any such Executive Branch department, agency, board, commission, or office to the Inspector General (or senior ethics official for any entity without an Inspector General), of the date, location, and number of employees attending such conference.

CORPORATE FELONY CONVICTION AND FEDERAL TAX LIABILITY REPRESENTATIONS (MARCH 2014)

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

- It is **not** a corporation that has been convicted of a felony criminal violation under any Federal law within the preceding 24 months,
- It is **not** a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

For purposes of these representations, the following definitions apply:

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

PUBLICATIONS

The recipient is expected to publish or otherwise make publicly available the results of the work conducted under any award resulting from this Funding Opportunity Announcement.

Publications and other methods of public communication describing any work based on or developed under an award resulting from this Funding Opportunity Announcement must contain an acknowledgment of DOE Office of Science support. The format for such acknowledgments is provided at <http://science.energy.gov/funding-opportunities/acknowledgements/>. The author's copy of any peer-reviewed manuscript accepted for funding must be announced to DOE's Office of Scientific and Technical Information and made publicly available in accordance with the instructions contained in the Reporting Requirements Checklist incorporated in all Assistance Agreements.

C. REPORTING

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

Section VII - QUESTIONS/AGENCY CONTACTS

A. QUESTIONS

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

For help with PAMS, click the “External User Guide” link on the PAMS website, <https://pamspublic.science.energy.gov/>. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, Email: sc.pams-helpdesk@science.doe.gov. All submission and inquiries about this Funding Opportunity Announcement should reference **DE-FOA-0001540**.

Please contact the PAMS help desk for technological issues with the PAMS system.

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

Due to the time required to provide complete and accurate answers to questions, all questions **must** be submitted through FedConnect no later than **12:00 Noon Eastern Time on September 15, 2016**. DOE may not respond to questions submitted after the designated time on September 15, 2016.

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

B. AGENCY CONTACTS

Grants.gov Customer Support	800-518-4726 (toll-free) support@grants.gov
PAMS Customer Support	855-818-1846 (toll-free) 301-903-9610 sc.pams-helpdesk@science.doe.gov
DOE Contact	Michael Hill michael.hill@science.doe.gov

Section VIII - OTHER INFORMATION

A. MODIFICATIONS

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

B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE

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

C. COMMITMENT OF PUBLIC FUNDS

(a) A DOE financial assistance award is valid only if it is in writing and is signed, either in writing or electronically, by a DOE Contracting Officer. A commitment by other than the Contracting Officer, either explicit or implied, is invalid.

(b) Recipients are free to accept or reject the award. A request to draw down DOE funds constitutes the Recipient's acceptance of the terms and conditions of this Award.

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 agreement 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 USC 5908 provides that title to such inventions vests in the United States, except where 35 USC 202 provides otherwise for nonprofit organizations or small business firms. However, the Secretary of Energy may waive all or any part of the rights of the United States subject to certain conditions. (See "Notice of Right to Request Patent Waiver" in paragraph G below.)

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

Intellectual Property terms: The standard DOE intellectual property provisions applicable to the various types of applicants under the FOA are located at <http://energy.gov/gc/standard->

[intellectual-property-ip-provisions-financial-assistance-awards.](#)

G. NOTICE OF RIGHT TO REQUEST PATENT WAIVER

Applicants may request a waiver of all or any part of the rights of the United States in inventions conceived or first actually reduced to practice in performance of an agreement as a result of this FOA, 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. For more information, see <http://energy.gov/gc/services/technology-transfer-and-procurement/office-assistant-general-counsel-technology-transf-1>

Domestic small businesses and domestic nonprofit organizations will receive the patent rights clause at 2 CFR Part 910, Appendix A of Subpart D, titled “Patent Rights (Small Business and Nonprofit Organizations)”. 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. AVAILABILITY OF FUNDS

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

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

No legal liability on the part of the Government for any payment may arise until funds are made available to the contracting officer for this award and until the awardee receives notice of such

availability, to be confirmed in writing by the contracting officer.

J. ENVIRONMENTAL, SAFETY AND HEALTH (ES&H)

Performance of Work at DOE Facilities

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

Federal, State, and Local Requirements

With respect to the performance of any portion of the work under this award, the recipient agrees to comply with all applicable local, state, and Federal ES&H regulations. The recipient shall apply this provision to all sub awardees at any tier.

K. NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) COMPLIANCE

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

Note that in most cases, even where potential impact on the environment exists, preparation of an EIS or EA is rarely necessary, but DOE has the expectation that the applicant will disclose the potential on the SF424 (R&R), which would serve to initiate a dialog with DOE. Should the applicant have any uncertainty, they should check “yes” and identify potential positive or negative impact(s) accordingly. Such dialog would have no bearing on selection. However, the inability to satisfy the NEPA requirements after an award would result in cancellation of any said award.