

**Department of Energy (DOE)
Office of Science (SC)
Biological and Environmental Research (BER)**



**Systems Biology Research to Advance
Bioenergy Crop Production**

**Notice of Funding Opportunity (NOFO) Number:
DE-FOA-0003453**

**NOFO Type: Initial
Catalog of Federal Domestic Assistance (CFDA) Number: 81.049**

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| NOFO Issue Date: | December 11, 2024 |
| Submission Deadline for Pre-Applications: | January 17, 2025_at 5PM Eastern Time A Pre-Application is required. |
| Pre-Application Response Date: | February 3, 2025 at 5PM Eastern Time |
| Submission Deadline for Applications: | March 26, 2025 at 11:59 PM Eastern Time |

Table of Contents

| | |
|--|----|
| I. BASIC INFORMATION | 1 |
| EXECUTIVE SUMMARY | 1 |
| FUNDING DETAILS..... | 1 |
| KEY FACTS..... | 1 |
| KEY DATES | 1 |
| AGENCY CONTACT INFORMATION..... | 2 |
| RECOMMENDATION | 2 |
| II. ELIGIBILITY | 3 |
| A. ELIGIBLE APPLICANTS | 3 |
| B. COST SHARING..... | 4 |
| C. ELIGIBLE INDIVIDUALS..... | 4 |
| D. LIMITATIONS ON SUBMISSIONS..... | 4 |
| III. PROGRAM DESCRIPTION..... | 6 |
| A. PURPOSE..... | 6 |
| B. PROGRAM GOALS, OBJECTIVES, AND PRIORITIES..... | 13 |
| C. AWARD CONTRIBUTION TO GOALS AND OBJECTIVES..... | 14 |
| D. PERFORMANCE GOALS..... | 14 |
| E. SUBSTANTIAL INVOLVEMENT..... | 14 |
| F. PROGRAM UNALLOWABLE COSTS | 14 |
| G. CITATIONS TO STATUTES AND REGULATIONS | 14 |
| H. PROGRAM HISTORY | 15 |
| I. OTHER INFORMATION..... | 15 |
| IV. APPLICATION CONTENTS AND FORMAT..... | 16 |
| A. PRELIMINARY SUBMISSIONS..... | 16 |
| B. APPLICATION..... | 18 |
| C. COMPONENT PIECES OF THE APPLICATION | 18 |
| D. INFORMATION THAT MUST BE SUBMITTED AFTER APPLICATION BUT BEFORE AWARD..... | 32 |
| V. SUBMISSION REQUIREMENTS AND DEADLINES | 33 |
| A. ADDRESS TO REQUEST APPLICATION PACKAGE..... | 33 |
| B. UNIQUE ENTITY IDENTIFIER (UEI) AND SYSTEM FOR AWARD MANAGEMENT (SAM.GOV) | 33 |
| C. SUBMISSION INSTRUCTIONS..... | 34 |

| | |
|--|----|
| D. SUBMISSION DATES AND TIMES..... | 34 |
| VI. APPLICATION REVIEW INFORMATION..... | 36 |
| A. RESPONSIVENESS REVIEW..... | 36 |
| B. REVIEW CRITERIA..... | 36 |
| C. REVIEW AND SELECTION PROCESS..... | 37 |
| D. RISK REVIEW..... | 38 |
| VII. AWARD NOTICES..... | 40 |
| A. TYPE OF AWARD INSTRUMENT..... | 40 |
| B. ANTICIPATED TIMELINE FOR NOTICE OF SELECTION FOR AWARD NEGOTIATION..... | 40 |
| VIII. POST-AWARD REQUIREMENTS AND ADMINISTRATION..... | 42 |
| A. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS..... | 42 |
| B. REPORTING..... | 43 |
| C. REPORTING OF MATTERS RELATED TO RECIPIENT INTEGRITY AND PERFORMANCE (DECEMBER 2015)..... | 43 |
| D. INTERIM CONFLICT OF INTEREST POLICY FOR FINANCIAL ASSISTANCE..... | 43 |
| IX. OTHER INFORMATION..... | 45 |
| A. CHECKLIST FOR AVOIDING COMMON ERRORS..... | 45 |
| B. HOW-TO GUIDES..... | 47 |
| C. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS..... | 71 |
| D. REFERENCE MATERIAL..... | 91 |

I. Basic Information

Executive Summary

The United States (U.S.) DOE SC program in Biological and Environmental Research (BER) announces it is receiving applications for research within the Biological Systems Science Division's (BSSD) Genomic Science Program (GSP) (<https://genomicscience.energy.gov>). In this NOFO, applications are requested for:

- i. Systems-level research to improve understanding of the molecular mechanisms underlying bioenergy feedstock productivity under varied and at times suboptimal environmental conditions.
- ii. Systems biology-enabled investigations into the roles of microbes and microbial communities (including rhizosphere consortia, e.g. bacteria, fungi, diazotrophs, endophytes, viruses) in supporting plant productivity and vigor.

Funding Details

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| Expected total available funding | Up to \$75 million |
| Expected number of awards | Approximately five (5) to fifteen (15) awards are expected |
| Expected dollar amount of individual awards | Approximately \$1,000,000 - \$3,000,000 per year. The maximum allowable budget per year is \$3,000,000 independent of the proposed project period. |
| Expected award project period | Up to five (5) years |

Key Facts

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| NOFO Title | Systems Biology Research to Advance Bioenergy Crop Production |
| NOFO Number | DE-FOA-0003453 |
| Announcement Type | Initial |
| Assistance Listing | 81.049 |
| Statutory Authority | The programmatic authorizing statute is: Section 646 of Public Law 95-91, U.S. Department of Energy Organization Act Section 901, et seq. of Public Law 109-58, Energy Policy Act of 2005 |
| Governing 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 |

Key Dates

Key dates are printed on the cover of this NOFO.

Agency Contact Information

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| Grants.gov Customer Support | 800-518-4726 (toll-free) support@Grants.gov |
| Portfolio Analysis and Management System (PAMS) Customer Support | 855-818-1846 (toll-free) 301-903-9610 sc.pams-helpdesk@science.doe.gov |
| Technical/Scientific Program Contact | Kari Perez 240-931-9627 kari.perez@science.doe.gov |
| Administrative Contact (questions about budgets and eligibility) | Meredith Rutledge 202-329-6371 meredith.rutledge@science.doe.gov |

Recommendation

SC encourages you to register in all systems as soon as possible. You are also encouraged to submit pre-applications and applications well before the deadline.

II. Eligibility

A. Eligible Applicants

All types of domestic applicants are eligible to apply, except nonprofit organizations described in section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995.

1. DOE/National Nuclear Security Administration (NNSA) National Laboratories

DOE/NNSA National Laboratories are not eligible to submit applications under this NOFO but may be proposed as subrecipients under another organization's application. If recommended for funding as a proposed subrecipient, the value of the proposed subaward will be removed from the prime applicant's award and will be provided to the laboratory through the DOE Field-Work Proposal System and work will be conducted under the laboratory's contract with DOE. No administrative provisions of this NOFO will apply to the laboratory or any laboratory subcontractor. Additional instructions for securing authorization from the cognizant Contracting Officer are found in [Section IX](#) of this NOFO.

2. Non-DOE/NNSA Funded Research and Development Centers (FFRDC)

Non-DOE/NNSA FFRDCs are not eligible to submit applications under this NOFO but may be proposed as subrecipients under another organization's application. If recommended for funding as a proposed subrecipient, the value of the proposed subaward may be removed from the prime applicant's award and may be provided through an interagency agreement to the FFRDC's sponsoring Federal Agency. Additional instructions for securing authorization from the cognizant Contracting Officer are found in [Section IX](#) of this NOFO.

3. Other Federal Agencies

Other Federal Agencies are not eligible to submit applications under this NOFO but may be proposed as subrecipients under another organization's application. If recommended for funding as a proposed subrecipient, the value of the proposed subaward may be removed from the prime applicant's award and may be provided through an interagency agreement. Additional instructions for providing statutory authorization are found in [Section IX](#) of this NOFO.

Notes for applicants of all types:

Applicants that are individual and/or not domestic organizations should be advised that:

- Individual applicants are unlikely to possess the skills, abilities, and resources to successfully accomplish the objectives of this NOFO. Individual applicants are encouraged to address this concern in their applications and to demonstrate how they will accomplish the objectives of this NOFO.
- Non-domestic applicants are advised that successful applications from non-domestic applicants include a detailed demonstration of how the applicant possesses skills, resources, and abilities that do not exist among potential domestic applicants.

This NOFO seeks to support basic research to advance understanding rather than to address commercial opportunities. Applications that propose research related to current commercial activity or current customer needs may be declined without merit review.

B. Cost Sharing

Cost sharing for basic and fundamental research is not required pursuant to an exclusion from the requirements of Section 988 of the Energy Policy Act of 2005.

Cost sharing is not required of DOE/NNSA National Laboratories, other Federal agencies, another Federal agency's FFRDC, or their subcontractors at any tier. DOE/NNSA National Laboratories, other Federal agencies, and another Federal agency's FFRDC may impose cost-sharing requirements on their contractors subject to their policies and procedures.

Cost sharing will not be considered as a factor during merit review or award selection.

C. Eligible Individuals

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

SC does not require that individuals be U.S. citizens or permanent residents to be proposed as a PI or in any other role under an award, but all personnel working or proposed to work under an award must have the legal right to perform such work in the jurisdiction where the work will be performed. Individuals at any stage of their career may be proposed as a PI if they have the skills, knowledge, and resources necessary to carry out the proposed research.

D. Limitations on Submissions

Applicant institutions are limited to one pre-application and/or applications for each PI at the applicant institution.

There is no limitation to the number of applications on which an institution appears as a subrecipient.

Should DOE receive submissions in excess of the applicable limits, DOE reserves the right, in its sole discretion, to request additional or clarifying information to ascertain the institution's intended submissions. Otherwise, DOE will consider the latest received submissions to be the institution's intended submissions.

- Pre-applications in excess of the limited number of submissions may be discouraged.
- Applications in excess of the limited number of submissions may be declined without review.

DOE/NNSA NATIONAL LABORATORY EFFORT

The scope of work to be performed by DOE/NNSA National Laboratories may not be more significant than the scope of work to be performed by the applicant.

The DOE/NNSA National Laboratory effort, in aggregate, shall not exceed 50 percent of the total estimated cost of the project, including the applicant's and the DOE/NNSA National Laboratories' portions of the effort.

LIMITATIONS ON PI

The PI on a pre-application or application may also be listed as a senior or key personnel including in any role on a proposed subaward, on an unlimited number of separate submissions.

III. Program Description

A. Purpose

The DOE SC program in Biological and Environmental Research (BER) announces it is receiving applications for research within the Biological Systems Science Division's (BSSD) Genomic Science Program (GSP) (<https://genomicscience.energy.gov>) mission-space. In this NOFO, applications are requested for:

- Systems-level research to improve understanding of the molecular mechanisms underlying bioenergy feedstock productivity under changing and at times suboptimal environmental conditions,
- Systems biology-enabled investigations into the role(s) of microbes and microbial communities (including rhizosphere consortia, e.g. bacteria, fungi, diazotrophs, endophytes, viruses) in supporting plant productivity and vigor are also solicited.

SUPPLEMENTARY INFORMATION

Two areas vital to the Nation's energy and environmental security motivate the BER research agenda: developing cost-effective biofuels and bioproducts and improving our ability to understand, predict, and mitigate the impacts of energy production in the face of a variable environment. BER has invested in plant and plant-microbe interactions research with the goal of advancing production of biofuels/bioproducts from domestic lignocellulosic and oilseed crop sources. These efforts have increased our understanding of the biological mechanisms underlying feedstock productivity and facilitated development of next-generation bioenergy crops that utilize novel, efficient bioenergy strategies that can be replicated on a mass scale. However, several knowledge gaps and challenges remain towards attaining the goal of developing vigorous crops with superior growth and yield under varying environmental conditions. A better understanding of the underlying genetic and physiological mechanisms influencing plant productivity, resource use efficiency, and adaptation and resilience to abiotic stress are needed. Also of interest is how beneficial plant-microbe associations may enhance requisite plant processes to enable manipulation of these associations for improving plant traits. Furthermore, available computational technologies and infrastructure may provide opportunities to connect and integrate information across multiple spatial and temporal scales to better understand the behavior of complex biological systems and to develop a predictive understanding of sustainability outcomes over a range of future climate scenarios [U.S. DOE.2014. Research for Sustainable Bioenergy: Linking Genomic and Ecosystem Sciences, Workshop Report, DOE/SC-0167. U.S. Department of Energy, Office of Science. <https://www.genomicscience.energy.gov/research-for-sustainable-bioenergy-linking-genomic-and-ecosystem-sciences/>].

DOE-BER's GSP (<https://genomicscience.energy.gov/>) supports fundamental research to identify the basic principles that drive biological systems. These principles govern translation of the genetic code into integrated networks of proteins, enzymes, regulatory elements, and metabolite pools underlying the functional processes of organisms. The Genomic Science program aims to support the DOE's bioenergy development mission by leveraging omics-driven tools and systems biology approaches to address key challenges facing the sustainable

production of bioenergy crops as an economically and environmentally viable alternative resource for fuels, chemicals, and products currently produced from fossil fuel resources. This NOFO aims to build upon the advances made since previous BER investments in this area, seeking to apply systems biology and omics technologies to map the complex networks and molecular mechanisms of bioenergy crop growth, development, and metabolism for sustainable and resilient bioenergy crop production. Understanding the multi-organismal “biofuel crop+soil+microbe ecosystem” presents a unique challenge, which is further complicated by environmental impacts. The ability to predict plant and microbial species’ responses to a changing environment will be critical to understanding potential environmental impacts as well as for optimizing feedstock production.

Applications are solicited for systems biology-driven basic research on the fundamental principles of bioenergy crop production in relationship to the associated environmental context. Species of interest include but are not limited to candidate bioenergy plants (e.g., sorghum, energy cane, Miscanthus, switchgrass, Populus) and non-food oilseed crops (e.g., Camelina). Proposed projects should be hypothesis-driven and focus on understanding productivity and the effects of abiotic stresses and nutrient availability. Such deep understanding will enable the development of bioenergy crops that are tolerant to environmental stressors, require less agronomic inputs, and are resilient and/or adaptable to varying environmental conditions.

Acceptable topics include, but are not limited to, the following areas of interest. Applicants may address one or more subject areas within either or both main topics, but the overall application should be well integrated with all objectives and approaches designed to further understanding of the overarching, main goal:

- i. Systems-level research to improve understanding of the molecular mechanisms underlying bioenergy feedstock productivity under varying and at times suboptimal environmental conditions. Proposed studies should provide better understanding of the molecular and physiological mechanisms that control bioenergy crop vigor, resource use efficiency, and resilience/adaptability to abiotic stress, as well as interactions with the surrounding environment. Topics can include but are not limited to:
 - a. Genetic manipulation of phenology to understand the traits and processes that affect the ability of a bioenergy crop to adapt to specific environmental conditions or stressors.
 - b. Processes that contribute to partitioning of photosynthates to various plant tissues to optimize biomass.
 - c. Investigations into the genetic and physiological mechanisms underlying processes that influence plant productivity such as resource use efficiency (e.g., water, nutrients, light); C and N metabolism and biomass allocation; vigor; adaptability to specific environmental conditions; phenology; and
 - d. Utilization of genetic diversity and comparative genomics to identify key phenes/genes/alleles that confer key plant resilience traits, and to optimize plant species for various ecoregions of the U.S.
- ii. Systems biology-enabled investigations into the role(s) of microbes and microbial communities (including rhizosphere consortia, e.g. bacteria, fungi, diazotrophs, endophytes, viruses) in supporting plant productivity and vigor. Proposed studies should contribute to a better understanding of bioenergy feedstock plant performance,

adaptation, and resilience in varying environmental conditions and abiotic stressors.

Topics can include but are not limited to:

- a. Influence of plant-associated microbiome composition and dynamics on fitness and productivity of bioenergy feedstock plants.
- b. Microbial effects on soil as it pertains to overall plant productivity, particularly during crop establishment and growth.
- c. Genomic basis by which plant genotypes cultivate specific interactions with rhizosphere communities and how microbes develop mutualistic relationship with plants over time and environments.
- d. How plants differentiate between mutualists and pathogens, and how beneficial communities can be utilized to alleviate plant abiotic stress; and
- e. Mechanisms controlling C inputs to and outputs from the belowground systems of bioenergy crops.

Additional Information:

This NOFO focuses on omics-driven basic research aimed at enabling the integrated development of sustainable bioenergy feedstock systems in terrestrial environments within the ecosystem context. Applications that include the development of integrative physiology-based models to attain a systems-level understanding of the plant and/or plant-microbiome ecosystem to identify key parameters of bioenergy plant sustainability are encouraged. Such applications should consider key variables such as genomic properties of biofuel crops and relevant biological processes (e.g. resource use efficiency, carbon and nitrogen metabolism, phenology, adaptation, rhizosphere community functions), enabling the quantitative, accurate prediction of plant performance and ecosystem processes under changing environments. In addition, applications that directly address bioenergy crops and their abiotic responses in a field setting are highly encouraged, as well as the use of computational technologies (e.g. machine learning) for integrative analyses and predictive modeling. Additionally, for applications focused on perennial crops, methods to reduce timelines such as the utilization of previously established perennial field sites are encouraged where applicable. Finally, applications focused on annual crops are encouraged to apply for an award duration of three years. Please see section ‘I. Basic Information’ of this NOFO for budgetary guidance for all project periods.

NOTE: BER encourages the submission of innovative “high-risk/high-reward” research applications that address critical knowledge gaps and have the potential for high impact. The probability of success and the risk- reward balance will be considered when making funding decisions. This NOFO encourages individual investigators as well as interdisciplinary teams that assemble a range of expertise into a coordinated approach. For the latter situation, applicants must include a clear plan describing the individual contributions of each participant, as well as an overall management scheme and the designation of a lead investigator and lead institution.

The following areas are not within the scope of this NOFO:

- Research on starch accumulation or nutritional qualities, digestion, and fermentation
- Studies of soybean, food-grade canola or other food-grade oilseed crops
- Crops targeted for food or human consumption, pharmaceutical production, or cosmetic use

- Applications targeting aquatic systems (e.g., algae)
- Applications focused on plant pathogen interactions
- Projects to develop life cycle analysis models
- Although the long-term vision of this research is to facilitate improvement of bioenergy feedstock crops, applications focused solely on applied breeding or breeding approaches will not be considered; and
- Applications primarily focused on plant or metagenomic sequencing are not encouraged for this NOFO and should instead be directed to the DOE Joint Genome Institute's Community Science Program: <https://jgi.doe.gov/user-programs/program-info/csp-overview/>.

Other Supplementary Information:

The following programmatic areas within BER are at the interface with GSP's sustainable bioenergy portfolio:

- **Environmental Microbiology:** The DOE-BER GSP within the BSSD includes research efforts in environmental microbiology focused on systems biology studies of regulatory, metabolic, and signaling networks of microbes, microbial consortia, and microbe-plant interactions involved in biogeochemical cycling of nutrients, and the development and application of -omics approaches to investigate microbial community processes involved in biogeochemical nutrient cycling in terrestrial ecosystems.
- **Environmental System Science (ESS) research** within Earth and Environmental Systems Sciences Division (EESSD) seeks to develop an integrated framework using a systems approach to elucidate the complex processes and controls on the structure, function, feedback, and dynamics of terrestrial ecosystems that span from the bedrock through the rhizosphere and vegetation to the atmospheric interface. The program scope advances foundational process knowledge from molecular to global scales and the interplay of key system components to enable an improved understanding of understudied ecosystems and environmental interfaces. This effort requires the linking of system components and their interfaces with ecological, watershed, and biogeochemical sciences to address key knowledge gaps across a range of spatial and temporal scales. Incorporation of process understanding into a range of scale appropriate models improves predictive understanding and future projections of the terrestrial system, which in turn enables the identification of new research questions and directions

Applications that focus on research that may be perceived to overlap with one of these programs need to provide details within the application that describes how the application is responsive to this specific NOFO.

Further information on DOE-BER objectives in this area of research can be found at: <https://www.genomicscience.energy.gov/sustainable-bioenergy/>. Information on the research projects currently funded by the GSP and a description DOE-BER mission priorities and overall program organization can be found at: <https://genomicscience.energy.gov/>. Information on DOE-BER supported research efforts in ESS can be found at <https://ess.science.energy.gov/program/>.

Data Sharing and Promoting Inclusive and Equitable Research (PIER) Plan: Information about the DOE GSP data release policy, with which awardees will be expected to comply, is available at <http://genomicscience.energy.gov/datasharing/>. Any application submitted without a data sharing and digital data management plan will be returned without review. A PIER plan is also required. PIER development plans and resources can be found at <https://science.osti.gov/grants/Applicant-and-Awardee-Resources/PIER-Plans>. Applications submitted without a PIER plan will be declined without review.

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 a wide variety of science areas. Applicants are encouraged to consider utilization or collaboration with DOE-funded facilities that have existing and dedicated financial support, thereby leveraging ongoing infrastructure investments, archived samples, User Facilities, and long-term data sets when developing their applications.

For Joint Genome Institute (JGI) and Environmental Molecular Sciences Laboratory (EMSL) capabilities (see table below), applicants should assess whether the project’s needs are within reasonable requests for the respective User Facility and reach out to the respective user program coordinator if the request might be considered large. Awarded projects will receive prioritized consideration for use of JGI capabilities, subject to an assessment of technical feasibility by the facility.

Examples of available user facilities and other specialized resources include:

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| <p><u>Environmental Molecular Sciences Laboratory (EMSL)</u></p> | <p>The EMSL (https://www.emsl.pnnl.gov/) located at the Pacific Northwest National Laboratory, is a DOE SC User Facility (https://science.osti.gov/User-Facilities). EMSL empowers scientific discovery of the mechanisms and dynamics that drive biological and environmental processes and interactions by providing users access to premier instruments for experimental research as well as igh Performance Computing (HPC). Experimental capabilities available include: advanced electron microscopy/imaging capabilities to study intra- and intercellular dynamics; nanoSIMS; computed x-ray tomography; high-resolution mass spectrometry and Nuclear Magnetic Resonance (NMR) spectroscopy for transcriptomics, metabolomics, and proteomics; controlled atmosphere plant growth chambers to study nutrient flux and interactions among plant roots, soil microbes and mineral surfaces; and software and associated hardware for data analytics and metabolic process modeling/simulation. These and other experimental and computational capabilities are available at no charge through a user proposal process (https://www.emsl.pnnl.gov/proposals). Applicants are also encouraged to explore the Facilities Integrating Collaborations for User Science (FICUS) initiative between JGI and EMSL (https://www.emsl.pnnl.gov/proposals/type/ficus-program), through</p> |
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| | <p>which capabilities at both user facilities can be combined and accessed with one proposal.</p> |
| <p><u>High Performance Computing (HPC) Centers</u></p> | <p>The DOE Office of Science supports leadership and HPC User Facilities, which provide compute cycles and data storage through a proposal process to the scientific community. These resources include capabilities at EMSL (https://www.emsl.pnnl.gov/science/instruments-resources/mid-range-scientific-computing; https://www.emsl.pnnl.gov/science/integrated-research-platforms/data-transformations), the National Energy Research Scientific Computing Center at the Lawrence Berkeley National Laboratory (LBNL) (https://www.neresc.gov), the Argonne Leadership Computing Facility at Argonne National Laboratory (ANL) (https://www.alcf.anl.gov/) and the Oak Ridge Leadership Computing Facility at Oak Ridge National Laboratory (ORNL) (https://www.olcf.ornl.gov/).</p> |
| <p><u>Joint Genome Institute (JGI)</u></p> | <p>The Joint Genome Institute (JGI) in Berkeley, California, is a DOE Office of Science User Facility that provides the scientific community access to state-of-the-art genomic sequencing and analysis capabilities, as well as modest amounts of deoxyribonucleic acid (DNA) synthesis and metabolomics capabilities, for microbial, plant, microbial community, and other (non- 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. These resources are available at no charge through a user proposal process (https://jgi.doe.gov/user-programs/).https://www.jgi.doe.gov). These resources are available at no charge through a user proposal process (https://jgi.doe.gov/user-programs/).</p> <p>Applicants are also encouraged to explore the FICUS initiative between JGI and EMSL, through which capabilities at these (and potentially other) User Facilities can be combined and accessed with one proposal (https://jgi.doe.gov/user-program-info/community-science-program/how-to-propose-a-csp-project/emsl).</p> |
| <p><u>DOE Systems Biology Knowledgebase (KBase)</u></p> | <p>The U.S Department of Energy Systems KBase (https://www.kbase.us/) is an open-source software and data platform designed to meet the grand challenge of systems biology— predicting and designing biological function from the biomolecular (small scale) to the ecological (large scale). KBase is available for anyone to use, and enables researchers to collaboratively generate, test, compare, and share hypotheses about biological functions; perform large-scale analyses on scalable computing infrastructure; and combine experimental evidence and conclusions that lead to accurate models of plant and microbial physiology and community dynamics. The KBase platform has (1) extensible analytical capabilities (2) a web-browser-based user interface that supports building, sharing, and publishing reproducible and well-annotated analyses with integrated data; (3) access to extensive computational resources; and (4) a software</p> |

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| | development kit allowing the community to add functionality to the system. |
| <u>National Microbiome Data Collaborative (NMDC)</u> | The DOE NMDC supports microbiome data exploration through a sustainable data discovery platform that promotes open science and shared-ownership across a broad and diverse community of researchers (https://microbiomedata.org/). For more information on NMDC collaborations visit https://microbiomedata.org/community/ . |
| <u>Neutron Beam Facilities</u> | DOE provides the scientific community access to high flux neutron sources that are capable of providing structural and chemical information often unavailable using other technologies. DOE has two such facilities at the ORNL, the Spallation Neutron Source ;(https://neutrons.ornl.gov/sns/) and the High Flux Isotope Reactor (https://neutrons.ornl.gov/hfir/). Use of the neutron sources is available at no charge through a user proposal process. For more information about the BER-supported structural biology resources at the synchrotron and neutron facilities, visit: https://www.berstructuralbioportal.org/ . |
| <u>Synchrotron Light Sources</u> | DOE provides the scientific community access to synchrotron light sources that are capable of providing structural and chemical information often unavailable with conventional sources of x-rays. Use of each synchrotron light source is available at no charge through its user proposal process. Information about each DOE synchrotron User Facility can be found at: ANL (https://www.aps.anl.gov/); Brookhaven National Laboratory (https://www.bnl.gov/ps/); LBNL (https://www.als.lbl.gov/); and Stanford Synchrotron Radiation Laboratory (https://www-ssrl.slac.stanford.edu/index.html). For more information about the BER-supported structural biology resources at the synchrotron and neutron facilities, visit: https://www.berstructuralbioportal.org/ . |

Annual Meetings

If a project is funded, beginning in the first year of funding, one or more project participants will be required to attend an annual GSP PI meeting, generally held in the National Capital Region. Reasonable travel expenses may be included as part of the project budget.

Teaming Arrangements

Multi-Institutional Teams

SC uses two different mechanisms to support teams of multiple institutions.

COLLABORATIVE APPLICATIONS

Collaborative applications (in which each team member submits its own application with a common project narrative) will not be accepted under this NOFO.

SUBAWARDS¹

Multi-institutional teams must submit one application from a designated lead institution with all other team members proposed as subrecipients.

DOE/NNSA National Laboratories², other Federal agencies, and another Federal agency's FFRDCs³, if participating in a team led by another institution, must be proposed as subrecipients.

Note that the value of any such proposed subaward may be removed from any such prime award: DOE may make separate awards to Federally affiliated institutions.

Open Science

SC is dedicated to promoting the values of openness in Federally supported scientific research, including, but not limited to, ensuring that research may be reproduced and that the results of Federally supported research are made available to other researchers. These objectives may be met through any number of mechanisms including, but not limited to, data access plans, data sharing agreements, the use of archives and repositories, and the use of various licensing schemes.

The use of the phrase “open-source” does not refer to any particular licensing arrangement, but is to be understood as encompassing any arrangement that furthers the objective of openness.

B. Program Goals, Objectives, and Priorities

The Office of Science's (SC) mission is to deliver scientific discoveries and major scientific tools to transform our understanding of nature and advance the energy, economic, and national security of the United States (U.S.). SC is the Nation's largest Federal sponsor of basic research in the physical sciences and the lead Federal agency supporting fundamental scientific research for our Nation's energy future.

SC accomplishes its mission and advances national goals by supporting:

- The frontiers of science—exploring nature's mysteries from the study of fundamental subatomic particles, atoms, and molecules that are the building blocks of the materials of our universe and everything in it to the DNA, proteins, and cells that are the building blocks of life. Each of the programs in SC supports research probing the most fundamental disciplinary questions.
- The 21st Century tools of science—providing the nation's researchers with 28 state-of-the-art national scientific user facilities, the most advanced tools of modern science, propelling the

¹ Subawards are made to subrecipients. Both terms are defined in 2 CFR 200.1 (<https://www.ecfr.gov>)

² The phrase “National Laboratories” is used broadly to encompass DOE/NNSA laboratories and sites capable of performing the work described in this NOFO and capable of receiving funds through the DOE Field Work System.

³ An authoritative list of all Federally Funded Research and Development Centers (FFRDCs) may be found at <https://www.nsf.gov/statistics/ffrdelist/>

U.S. to the forefront of science, technology development, and deployment through innovation.

- Science for energy and the environment—paving the knowledge foundation to spur discoveries and innovations for advancing the Department’s mission in energy and environment. SC supports a wide range of funding modalities from single principal investigators to large team-based activities to engage in fundamental research on energy production, conversion, storage, transmission, and use, and on our understanding of the earth systems.

SC is an established leader of the U.S. scientific discovery and innovation enterprise. Over the decades, SC investments and accomplishments in basic research and enabling research capabilities have provided the foundations for new technologies, businesses, and industries, making significant contributions to our nation’s economy, national security, and quality of life.

C. Award Contribution to Goals and Objectives

Awards resulting from this NOFO are intended to increase our understanding of scientific phenomena.

D. Performance Goals

You will be expected to demonstrate progress toward increasing knowledge in annual progress reports and presentations at annual PI meetings.

E. Substantial Involvement

Not applicable.

F. Program Unallowable Costs

You must apply the cost principles of 2 CFR 200, as modified by 2 CFR 910 and 10 CFR 605, to your application and any resulting award.

G. Citations to Statutes and Regulations

The programmatic authorizing statutes are:

Section 646 of Public Law 95-91, U.S. Department of Energy Organization Act

Section 901, et seq. of Public Law 109-58, Energy Policy Act of 2005

The governing regulations are:

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

H. Program History

You can learn about SC's history at <https://science.osti.gov/About/History>. You can read about our achievements at <https://science.osti.gov/Science-Features/Science-Highlights>. You can find information about all of our awards at <https://pamspublic.science.energy.gov/WebPAMSEExternal/interface/awards/AwardSearchExternal.aspx>.

I. Other Information

ANTICIPATED AWARD SIZE

The award size will depend on the number of meritorious applications and the availability of appropriated funds.

PERIOD OF PERFORMANCE

DOE anticipates making awards with a project period of up to five (5) years. Please note that the project period is independent of the yearly award size which is up to \$3,000,000 per year.

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.

AWARD BUDGET PERIODS

SC is committed to distributing workloads (internally and externally) across as much of the calendar as is practical. Accordingly, awards made under this NOFO will generally be made with budget periods that end between December 1 and June 30. New awards may be made with a first budget period of more than 12 months.

Applicants should prepare budgets with 12-month budget periods. Actual start dates and cycle dates will be negotiated if an application is recommended for award. Budget periods will generally not be made for less than nine (9) months or more than 18 months.

IV. Application Contents and Format

A. Preliminary Submissions

1. Letter of Intent (LOI)

Not applicable.

2. Pre-application

Pre-Application Due Date

The pre-application due date is printed on the cover of the NOFO.

ENCOURAGE/DISCOURAGE DATE

The pre-application response date is printed on the cover of the NOFO.

A pre-application is required and must be submitted by the date indicated on the cover of the NOFO.

Pre-applications will be reviewed for responsiveness of the proposed work to the research topics identified in this NOFO. DOE will send a response by email to each applicant encouraging or discouraging the submission of an application by the date indicated on the cover of the NOFO. 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.

Applications that have not been encouraged by DOE may be declined without merit review.

The pre-application must begin with a title page that will not count toward the pre-application page limitation. Include, at the top of the first page, the following information:

Title of Pre-application

PI Name, Job Title

[Lead] Institution

PI Phone Number, PI Email Address

NOFO Number: Include the NOFO Number indicated on the cover of this NOFO

Include a list of all senior/key personnel at the applicant institution.

Include a list of all senior/key personnel at the applicant and team member institutions.

List of Collaborating Institutions Including Subrecipients [if applicable]

PI Names and Job Titles at the Collaborating Institutions Including Subrecipients

The material listed here defines the required content of a title page. Additional material is not allowed.

The first page of the pre-application must specify at least one scientific hypothesis whose investigation motivates the proposed work, using no more than 100 words, in a box with a black border. For any hypothesis that is not itself innovative, the pre-application must

describe at least one innovative insight into how the hypothesis can be investigated that may be exploited by the planned research.

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 three pages, when printed using standard letter-size (8.5-inch x 11-inch) paper with 1-inch margins (top, bottom, left, and right). The body text font must not be smaller than 11 point. Figures and references, if included, must fit within the three-page limit. Pre-applications that exceed the page limit will be discouraged. It is the responsibility of the applicant to include sufficient information in the pre-application to enable evaluation of responsiveness to this announcement.

In addition, the pre-application must include a listing of senior/key personnel and a listing of individuals who should not serve as merit reviewers of a subsequent application. Detailed instructions for how to craft the required listings are provided in [Section IX](#) of this NOFO. **Note that the listing of individuals who should not serve as merit reviewers is rarely empty because the instructions contain mandatory inclusions requirements.** This listing will not count toward the pre-application's page limit. The list of individuals must be included as an "Additional Attachment" to your pre-application in the Portfolio Analysis and Management System (PAMS).

The pre-application may include a list of suggested reviewers (including email address and organizational affiliation) who they believe are especially well qualified to review the application. DOE is under no obligation to consider any suggested reviewers.

The pre-application must be machine-readable. Do not submit a scanned image of a printed document.

PRE-APPLICATION REVIEW

Those pre-applications that are encouraged will be used to help SC begin planning for the application peer review process. SC's intent in discouraging submission of certain applications is to save the time and effort of applicants in preparing and submitting applications not responsive to this NOFO.

The PI will be automatically notified when the pre-application is encouraged or discouraged. PAMS will send an email to the PI 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 encourage or discourage are finalized.

PRE-APPLICATION SUBMISSION

Pre-applications are created in the software system of your choice and must be submitted electronically through the DOE SC PAMS website <https://pamspublic.science.energy.gov/>. You cannot draft or edit a pre-application in PAMS. Do not submit a pre-application through [FedConnect](#) or [Grants.gov](#).

Pre-applications may be submitted by a PI or by other users at the PI's institution with the "Submit to DOE" privilege in PAMS.

Applicants are strongly encouraged to inform their DOE Program Manager if teaming arrangements, proposed personnel, topics, or the anticipated title change between submitting the pre-application and when an application is submitted, to ensure that their application is properly linked to their pre-application and that reviewers are properly assigned to the application.

Detailed instructions about how to submit a pre-application are in [Section IX](#) of this NOFO.

B. Application

Applications in response to this NOFO must be submitted through Grants.gov. Detailed instructions for registering in and using Grants.gov are in [Section IX](#) of this NOFO.

C. Component Pieces of the Application

LETTERS OF COLLABORATION OR ACCESS

Letters from collaborators or from institutions providing access to data, models, software, equipment and/or facilities may be appended to your project narrative and are not considered part of the project narrative's page limit. Please ensure that letters from collaborators or from institutions providing access to data, models, software, equipment and/or facilities only describe the nature of the collaboration or the access to data, models, software, equipment and/or facilities. Letters of recommendation are not allowed in applications under this NOFO.

All letters may be addressed "To Whom It May Concern:".

Letters of collaboration or access should be placed in Appendix 8 (Other Attachments). Letters of collaboration or access must not be written as recommendation or endorsement letters, which are not allowed. Each letter of collaboration or access may contain two and only two sentences and must use the following format:

Dear <Principal Investigator Name>:

If your application entitled, "<Application Name>," is selected for funding under the NOFO Name, it is my intent to collaborate in this research by <Complete sentence with a very short description of what the collaborator offers to do or provide>.

Thank you for the opportunity to participate.

Sincerely,

<Collaborator's Name and Signature Block.>

SCIENTIFIC USER FACILITIES

Documentation from any SC scientific user facility (<https://science.osti.gov/User-Facilities>) may be provided with other letters of collaboration or access in Appendix 8 (Other Attachments).

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 <https://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms> under Certifications and Assurances⁴. Applicants are bound by their representations and certifications in [SAM.gov](https://www.sam.gov).

TYPE OF SUBMISSION (FIELD 1)

Select the checkbox for “Application” for an initial submission. Select the checkbox for “Changed/Corrected Application” if submitting an updated version of an application. Do not submit pre-applications via [Grants.gov](https://www.grants.gov): Do not select the checkbox for “Pre-application.”

IDENTIFYING NUMBERS (FIELD 4)

UEI AND EIN NUMBERS (FIELDS 5 AND 6)

The Uniform Entity Identifier (UEI) and Employer Identification Number (EIN) 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 the UEI as a 12-digit alpha-numerical sequence.
- Enter the EIN as a nine-digit number.
- Do not use hyphens or dashes.
- SC does not use the 12-digit EIN format required by some other agencies.
- Applications will not be rejected if an applicant’s system-to-system service uses a 12-digit EIN format or inserts hyphens or dashes in an EIN.

TYPE OF APPLICATION (FIELD 8)

A **new** application is one in which DOE support for the proposed research is being requested for the first time.

SC does not make use of the Resubmission or Continuation 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

⁴ No separate form or submission is required for the Certifications and Assurances.

another Federal agency. Indicate the agency or agencies to which the similar objectives have been submitted.

Do not attach pre-applications to Field 20 of the SF-424(R&R) form or letters of intent to Field 21 of the SF-424(R&R) form.

DOE will only accept new applications under this NOFO.

2. Research and Related Other Project Information

Complete questions in fields 1 through 6 of the SF-424 Research and Related Other Project Information form.

Note regarding 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, impacts to endangered species or historic properties, etc.). Should the applicant have any uncertainty, they should check “yes.”

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 in Appendix B. (<https://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, 1) if there would be extraordinary circumstances (i.e., factor or circumstance that could increase the level of significance of environmental effects normally associated with the proposed action) (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 bulk of your application will consist of files attached to the Research and Related Other Project Information form. 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. The project summary/abstract must be comprised of:

- The project title, the PI name and the PI's institutional affiliation, and any coinvestigators and their institutional affiliations. This information will not count toward the abstract's one-page limit.
- This information must be followed by a statement of the project's objectives, a description of the project, including methods to be employed, and the potential impact of the project (i.e., benefits, outcomes).
- The description of the proposed research may not exceed one page (excluding Project Title and list of investigators) when printed using standard letter-size (8.5-inch x 11-inch) paper with 1-inch margins (top, bottom, left, and right). The body text font must not be smaller than 11 point. Figures and references, if included, must fit within the one-page limit.

A sample is provided below:

| |
|--|
| <p>Project Title</p> <p>A. Smith, Lead Institution (Principal Investigator) A. Brown, Institution 2 (Co-Investigator) A. Jones, Institution 3 (Co-Investigator)</p> <p>Text of abstract (no more than one page, excluding Project Title and list of investigators)</p> |
|--|

If an application is recommended for award, the project summary will be used in preparing a public abstract about the award. Award abstracts and titles form a Government document that describes the project and justifies the expenditure of Federal funds in light of the DOE and SC mission statements at <https://energy.gov/mission> and <https://science.osti.gov/about/>.

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

DOE TITLE PAGE

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

The application narrative must begin with a title page that will not count toward the project narrative page limitation. The title 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:
- NOFO Number: (Include the NOFO number printed on the cover of this NOFO.)
- DOE/SC Program Office:
- DOE/SC Program Office Technical Contact:
- PAMS Pre-application tracking number (if applicable):

Senior/Key Personnel

- Senior/Key Personnel Name, Institution
- Senior/Key Personnel Name, Institution
- Senior/Key Personnel Name, Institution

| Institution | Year 1 Budget | Year 2 Budget | Year ... Budget | Total Budget |
|--------------------|----------------------|----------------------|------------------------|---------------------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

The material listed here defines the required content of a title page. Additional material is not allowed.

Important Instructions to the Sponsored Research Office of Submitting Institutions: SC requires that you create one single machine-readable Portable Document Format (PDF) file that contains the DOE Title Page, project narrative, all required appendices, and other attachments. This single PDF file may not be scanned from a printed document and must be attached in Field 8 on the Grants.gov form. This must be a plain PDF file 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. The project narrative will be read by SC staff using the full version of Adobe Acrobat: Please ensure that the narrative is readable in Acrobat. If combining multiple files into one project narrative, ensure that a PDF portfolio or binder is not created. If creating PDF files using any software other than Adobe Acrobat, please use a “Print to PDF” or equivalent process to ensure that all content is visible in the project narrative. Once a project narrative has been assembled, please submit the combined project narrative file through a “Print to PDF” or equivalent process to ensure that all content is visible in one PDF file that can be viewed in Adobe Acrobat. Do not attach any of the appendices listed in this paragraph separately in any other field in Grants.gov. If you do, these additional attachments will not become part of the application in PAMS.

PROJECT NARRATIVE (FIELD 8 ON THE FORM)

The project narrative **must not exceed a page limit of 25 pages** of technical information, including charts, graphs, maps, photographs, and other pictorial presentations, when printed

using standard letter-size (8.5-inch x 11-inch) paper with 1-inch margins (top, bottom, left, and right). The body text font of all main text must not be smaller than 11 point. Merit reviewers will only consider the number of pages specified in the first sentence of this paragraph. This page limit does not apply to the Title Page, Budget Page(s), Budget Justification, biographical material, publications and references, appendices, and an optional table of content, each of which may have its own page limit defined later in this NOFO.

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

The Project Narrative comprises the research plan for the project. It should contain enough background material in the Introduction, including a brief review of the relevant literature and any prior research in this area, to demonstrate sufficient knowledge of the state of the science. The major part of the narrative should be devoted to a description and justification of the proposed project, including details of the methods to be used. It should also include a timeline for the major activities of the proposed project and should indicate which project personnel will be responsible for which activities. 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.

The following organization of the Project Narrative is suggested:

- **Background/Introduction:** Explanation of the importance and relevance of the proposed work as well as a review of the relevant literature.
- **Project Objectives:** This section should provide a clear, concise statement of the specific objectives/aims of the proposed project.
- **Proposed Research and Methods:** Identify the hypotheses to be tested and details of the methods to be used including the integration of experiments with theoretical and computational research efforts.

Buy America Requirement for Infrastructure Projects

Awards funded through this NOFO that are for, or contain, construction, alteration, maintenance, or repair of public infrastructure in the United States undertaken by applicable recipient types, require that:

- All iron, steel, and manufactured products used in the infrastructure project are produced in the United States; and
- All construction materials used in the infrastructure project are manufactured in the United States.

Applicants should consult 2 CFR 184 and [Section IX](#) of this NOFO to determine whether the Buy America Requirement applies and if they should consider the application of the Buy America Requirement in the proposed project’s budget and/or schedule.

Within the first two (2) pages of the Project Narrative, include a short statement on whether the project will involve the construction, alteration, maintenance and/or repair of public infrastructure in the United States. See [Section IX](#) of this NOFO for applicable definitions and other information regarding Infrastructure Projects and the Buy America Requirement.

The Project Narrative is considered the intellectual work of the proposed researchers. Concurrent submission of the same or substantially similar narratives attributed to different researchers may constitute academic dishonesty or research misconduct. Submission of a project narrative that is not the work of the proposed researchers, including machine-generated project narratives, may constitute academic dishonesty or research misconduct.

Do not attach any of the requested appendices described below as files for fields 9, 10, 11, and 12 in [Grants.gov](#). Follow the below instructions to include the information as appendices in the single project narrative file.

Biographical sketches and current and pending support may no longer be provided as attachments to a project narrative. These documents must be attached to the Research and Related Senior/Key Person Profile (Expanded) form in an application.

APPENDIX 1: 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 10 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.

- This appendix will not count in the project narrative page limitation.
- Do not attach a bibliography to Field 9 of the Research and Related Other Project Information form.

APPENDIX 2: FACILITIES & OTHER RESOURCES

This information is used to assess the capability of the organizational resources, including subrecipient resources, available to perform the effort proposed. Identify the facilities to be used (Laboratory, Animal, Computer, Office, Clinical and Other). If appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. Describe only those resources that are directly applicable to the proposed work. Describe other resources available to the project (e.g., machine shop, electronic shop) and the extent to which they would be available to the project. 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. Such documents, provided that they do not become letters of support or recommendation, may be printed on any letterhead. Please provide the Facility and Other Resource information as an appendix to your project narrative.

- This appendix will not count in the project narrative page limitation.
- Do not attach a facilities and other resources statement to Field 10 of the Research and Related Other Project Information form.

APPENDIX 3: 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.

- This appendix will not count in the project narrative page limitation.
- Do not attach an equipment statement to Field 11 of the Research and Related Other Project Information form.

APPENDIX 4: DATA MANAGEMENT PLAN

Provide a Data Management Plan (DMP) as an appendix to the project narrative. Data management plans are not required for applications that only request support for a conference, workshop, or scientific meeting. Subject to the applicable cost principles, applications may request costs necessary for implementing the DMP.

- This appendix should not exceed a page limit of three (3) pages including charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard letter-size (8.5-inch x 11-inch) paper with 1-inch margins (top, bottom, left, and right)
- Do not attach a separate file to Field 12 of the Research and Related Other Project Information form.
- This appendix will not count in the project narrative page limitation.

The standard requirements for a DMP may be found in [Section IX](#) of this NOFO.

The DMP should include 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 (<https://science.osti.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 at <https://science.osti.gov/user-facilities/>.

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.

All funded projects will also be required to comply with the GSP data sharing policy (<https://www.genomicscience.energy.gov/datasharing/>). Applications must include a detailed plan for data management and data sharing that includes details on submitting publication-related data and information to a national or international public repository.

DMPs will be reviewed as part of the overall SC research proposal merit review process. Applicants are encouraged to consult the SC website for further information and suggestions for how to structure a DMP: <https://science.osti.gov/Funding-Opportunities/Digital-Data-Management>

In addition, the DMP should specifically address:

- How FAIR (Findable, Accessible, Interoperable, and Reusable)⁵ principles will apply to the anticipated data sets, software⁶, and models⁷ to be developed.
- What developed software, data sets, and models will be made available using an “opensource” licensing arrangement, noting the Software Package Data Exchange (SPDX) identifier(s) (<https://spdx.org/licenses/>) when possible, and where deviation in this arrangement is expected from The Open Source Initiative’s “Open Source Definition” (<https://opensource.org/osd>), a specific justification must be provided.
- How best practices in scientific software development will be applied to any development activities. For more information on best practices, see Better Scientific Software (<https://bssw.io/>).

⁵ Wilkinson, M. D. et al. The FAIR Guiding Principles for Scientific Data Management and Stewardship. *Sci. Data* 3:160018, 2016. <https://doi.org/10.1038/sdata.2016.18>

⁶ Chue Hong, N. P., Katz, D. S., Barker, M., Lamprecht, A-L, Martinez, C., Psomopoulos, F. E., Harrow, J., Castro, L. J., Gruenpeter, M., Martinez, P. A., Honeyman, T., et al. (2022). FAIR Principles for Research Software version 1.0. (FAIR4RS Principles v1.0). Research Data Alliance. DOI: <https://doi.org/10.15497/RDA00068>

⁷ Ravi, N., Chaturvedi, P., Huerta, E.A. et al. FAIR principles for AI models with a practical application for accelerated high energy diffraction microscopy. *Sci Data* 9, 657 (2022). <https://doi.org/10.1038/s41597-022-01712-9>

APPENDIX 5: PROMOTING INCLUSIVE AND EQUITABLE RESEARCH (PIER) PLAN

All new and renewal applications that are not for conference support must provide a PIER Plan as an appendix to the project narrative. The PIER plan should describe the activities and strategies of the applicant to promote equity and inclusion as an integral element to advancing scientific excellence in the research project within the context of the proposing institution and any associated research group(s)⁸. Plans may include, but are not limited to: strategies for enhanced recruitment of undergraduate students, graduate students, and early-stage investigators (postdoctoral researchers, and others), including individuals from diverse backgrounds and groups historically underrepresented in the research community; strategies for creating and sustaining a positive, inclusive, safe, and professional research and training environment that fosters a sense of belonging among all research personnel; and/or training, mentoring, and professional development opportunities⁹. **PIER Plans should be tailored to the research project.** While PIER Plans may incorporate or build upon existing efforts of the project key personnel or applicant institution(s) to recruit diverse participants and create inclusive research environments, plans should not be a re-statement of standard institutional policies or broad principles. The complexity and detail of a PIER Plan is expected to increase with the size of the research team and the number of personnel to be supported.

Resources about PIER plans are available at <https://science.osti.gov/grants/Applicant-and-Awardee-Resources/PIER-Plans>. Subject to the applicable cost principles, applications may request costs necessary for implementing the PIER Plan.

- Do not attach a separate file to Field 12 of the Research and Related Other Project Information form.
- This appendix should not exceed a page limit of 3 pages when printed using standard letter-size (8.5-inch x 11-inch) paper with 1-inch margins (top, bottom, left, and right). This appendix will not count in the project narrative page limitation.

APPENDIX 6: SYNERGISTIC ACTIVITIES (OPTIONAL)

In addition to biographical sketches in the Common Format, each senior/key person may provide a one-page list of no more than five distinct examples of synergistic activities that demonstrate the individual's professional and scholarly activities that focus on the integration, transfer, and creation of knowledge as related to the application.

- Do not attach a separate file to Field 12 of the Research and Related Other Project Information form.
- This appendix may not exceed a limit of the same number of pages as senior/key personnel when printed using standard letter-size (8.5-inch x 11-inch) paper with 1-inch margins (top, bottom, left, and right). This appendix will not count in the project narrative page limitation.

⁸ Please see definitions and related information at <https://science.osti.gov/SW-DEI/DOE-Diversity-Equity-and-Inclusion-Policies/Q-and-As#definitions>

⁹ Please see additional information on things to consider when developing a PIER Plan: <https://science.osti.gov/grants/Applicant-and-Awardee-Resources/PIER-Plans/Things-to-Consider-When-Developing-a-PIER-Plan>.

APPENDIX 7: PROGRESS FROM DOE-FUNDED RESEARCH:

Provide a description of past research funded by BER applicable to the application being submitted, including products produced. If no applicable previous DOE-funded research exists, this Appendix should only consist of a statement to that effect.

- Do not attach a separate file to Field 12 of the Research and Related Other Project Information form.
- This appendix should not exceed a page limit of 3 pages when printed using standard letter-size (8.5-inch x 11-inch) paper with 1-inch margins (top, bottom, left, and right). This appendix will not count in the project narrative page limitation.

APPENDIX 8: 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.

- Do not attach a separate file to Field 12 of the Research and Related Other Project Information form.
- This appendix will not count in the project narrative page limitation.

3. Research and Related Senior/Key Person Profile (Expanded)

Complete the Research and Related Senior/Key Person Profile (Expanded) form in accordance with the instructions on the form and the following instructions. Complete this form before the Budget form to populate data on the Budget form.

You must submit this information for the PI and all senior/key personnel who will be identified by name in Section A of the application’s budget. List all other personnel who contribute in a substantive, meaningful way to the scientific development or execution of the project, whether or not salaries are requested. Consultants should be included in this “Senior/Key Person Profile (Expanded)” Form if they meet this definition. List individuals that meet the definition of senior/key regardless of what organization they work for. Senior/key personnel must be aware that they are included in the application and must agree to perform the work if awarded. The form will pre-populate with the PI identified on the SF-424(R&R) form. For each senior/key person:

- Complete the required sections in their profile.
- In the “credential” field, enter the person’s PAMS username, if known.
- Attach the person’s biographical sketch, following the instructions in [Section IX](#) of this NOFO for crafting a biographical sketch.
- Attach the person’s current and pending support, following the instructions in [Section IX](#) of this NOFO for crafting current and pending support.

The Senior/Key Person Profile (Expanded) form will support the PI and up to 99 additional senior/key personnel. On the addition of the 99th senior/key person, you will be presented with an option to upload an additional file with the required information for all other senior/key personnel.

4. 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. All fields with a red border are required, but you may enter a zero “0” in any field in which funds are not being requested. 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 NOFO.

Additional information is found in [Section IX](#) of this NOFO.

BUDGET JUSTIFICATION (FIELD L ON THE FORM)

Provide a justification that explains all costs proposed in the budget. The following items of advice are offered to assist you in developing a justification.

- Organize the justification by listing items in the same order as presented on the budget.
- Ensure that the narrative matches the budget in dollar amounts and language.
- Explain the line items. If costs are estimated, provide a basis for the estimate. Explain if costs are based on prior experience of similar activities. If a cost is based on the product of two numbers (such as a number of items at a per-item price), ensure that your math is correct.
- If including an inflationary factor for future budget periods, explain the basis for the inflationary factor.

Provide any other information you wish to submit to justify your budget request. Including items in the budget justification is not considered a form of cost-sharing: Provide the details of all personnel (key or other) who will be working on the award, regardless of their source(s) of compensation. Explain their source(s) of compensation if it is not from this award. Include the indirect cost rate agreement as a part of the budget justification.

Attach a single budget justification file for the entire project period in field L. The file automatically carries over to each budget year.

Additional information is found in [Section IX](#) of this NOFO.

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

Budgets for Subawards: You must provide a separate R&R budget and budget justification for each subrecipient. Download the R&R Budget Attachment from the R&R SUBAWARD

BUDGET ATTACHMENT(S) FORM and either email it to each subrecipient that is required to submit a separate budget or use the collaborative features of Workspace. After the subrecipient has either emailed its completed budget back to you or completed it within Workspace, attach it to one of the blocks provided on the form. All fields with a red border are required, but you may enter a zero “0” in any field in which funds are not being requested. Use up to 10 letters of the subrecipient’s name (plus.pdf) as the file name (e.g., ucla.pdf or energyres.pdf). Filenames must not exceed 50 characters.

If the project involves more subrecipients 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 L.

Applicants should consult their local information technology (“IT”) support resources for any necessary assistance in converting the forms downloaded from [Grants.gov](https://www.grants.gov) into plain PDF files that can be combined into one non-Portfolio PDF file (the Budget Justification).

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

Note: If an application proposes subawards to a DOE/NNSA National Laboratory, a Federal agency, or another Federal agency’s FFRDC, the value of such proposed subawards may be deducted from any resulting award: Those classes of organizations may be paid directly by SC. However, the details of such proposed budgets are an essential for understanding and analyzing the proposed research.

If the budget for an application is comprised of discrete or separable projects or tasks, the SUBAWARD BUDGET ATTACHMENT(S) FORM allows you to identify a budget as belonging to either a “project” or a “subaward.”

The standard subaward budget form allows for a maximum of 10 subawards. If an application contains more than 10 subawards, please present the budgets for the eleventh and subsequent subawards in a tabular format, followed by the appropriate budget justification, as a part of the lead applicant’s budget justification.

6. 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.

7. Disclosure of Lobbying Activities (SF-LLL)

If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the grant/cooperative agreement, you must complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying." Applicants that have never paid any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress do not need to submit this form.

8. Identification of Merit Reviewer Conflicts

Provide a list of individuals who should not serve as merit reviewers of this application, following the instructions in [Section IX](#) of this NOFO. Attach this information to Field 12 of the Research and Related Other Project Information Form.

9. 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 |
| Identification of Merit Review Conflicts | File | Field 12 |
| RESEARCH & RELATED Senior/Key Person Profile (Expanded) | Form | N/A |
| RESEARCH & RELATED BUDGET | Form | N/A |
| Budget Justification | PDF | Field L |
| R&R SUBAWARD BUDGET ATTACHMENT(S) FORM (if applicable) | Form | N/A |
| Subaward Budget Justification (if applicable) | PDF | Field L of the subaward budget |
| PROJECT/PERFORMANCE SITE LOCATION(S) | Form | N/A |
| SF-LLL Disclosure of Lobbying Activities, if applicable | Form | N/A |

D. Information that Must be Submitted After Application but Before Award

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
- Information required to resolve concerns about conflicts of interest, conflicts of commitment, potential duplication of support

Applicants that are not institutions of higher education, that request indirect costs, and that do not already have an Indirect Cost Rate Agreement with their Cognizant Federal Agency or documentation of rates accepted for estimating purposes by DOE or another Federal agency, are advised to begin preparing an Indirect Cost Rate Proposal for submission, upon request, to the DOE contract specialist/grants management specialist who will evaluate your application if you are selected for award.

V. Submission Requirements and Deadlines

A. Address to Request Application Package

Application forms and instructions are available at Grants.gov. To access these materials, go to <https://www.Grants.gov>, select “Search Grants”, and then enter the Catalog of Federal Domestic Assistance (CFDA)¹⁰ number (81.049) and/or the NOFO number shown on the cover of this NOFO. Select the “Apply” button to access the application package.

Applications submitted through www.FedConnect.net will not be accepted. Applications may not be submitted through PAMS at <https://pamspublic.science.energy.gov>.

Detailed instructions for registering in and using Grants.gov are in [Section IX](#) of this NOFO.

B. Unique Entity Identifier (UEI) and System for Award Management (SAM.gov)

Applicants must complete a series of registrations and enrollments to submit applications in response to this NOFO. Applicants not currently registered with SAM and Grants.gov should allow **at least four weeks** to complete these requirements. Applicants refers to the legal entity submitting an application: This is usually a corporate entity, not an individual investigator.

You should start the process as soon as possible.

You may not be able to use your preferred Internet browser: Each system has its own requirements.

Applicants must register with SAM at <https://www.sam.gov/> and obtain a UEI. Assistance is available at <https://sam.gov/content/help>.

Applicants must provide a Taxpayer Identification Number (TIN) to complete their registration in www.SAM.gov. An applicant’s TIN is an EIN assigned by the Internal Revenue Service (IRS). You may obtain an EIN from the IRS at <https://www.irs.gov/businesses/small-businesses-self-employed/apply-for-an-employer-identification-number-ein-online>.

If entities have technical difficulties with the UEI validation or SAM registration process, they should utilize the HELP feature on SAM.gov. SAM.gov will work entity service tickets in the order in which they are received and asks that entities not create multiple service tickets for the same request or technical issue.

Do not use a SSN as a TIN.

Obtain a TIN from the IRS using the website listed above.

¹⁰ The Catalog of Federal Domestic Assistance has been replaced by the Assistance Listings in the System for Award Management at <https://www.SAM.gov>. They are still listed as CFDA in Grants.gov at <https://www.grants.gov>.

1. Requirement for System for Award Management

Unless exempt from this requirement under 2 CFR 25.110, the recipient must maintain a current and active registration in SAM.gov. The recipient's registration must always be current and active until the recipient submits all final reports required under this Federal award or receives the final payment, whichever is later. The recipient must review and update its information in SAM.gov at least annually from the date of its initial registration or any subsequent updates to ensure it is current, accurate, and complete. If applicable, this includes identifying the recipient's immediate and highest-level owner and subsidiaries and providing information about the recipient's predecessors that have received a Federal award or contract within the last three years.

2. Requirement for Unique Entity Identifier (UEI)

If the recipient is authorized to make subawards under this Federal award, the recipient:

- Must notify potential subrecipients that no entity may receive a subaward until the entity has provided its UEI to the recipient.
- Must not make a subaward to an entity unless the entity has provided its UEI to the recipient. Subrecipients are not required to complete full registration in SAM.gov to obtain a UEI.

C. Submission Instructions

Letters of Intent (LOIs) and pre-applications, if permitted under this NOFO, must be submitted in PAMS at <https://pamspublic.science.energy.gov>. Detailed instructions for LOIs are in [Section IX](#) of this NOFO. Detailed instructions for pre-applications are in [Section IX](#) of this NOFO.

Applications must be submitted in Grants.gov at <https://www.grants.gov>. Detailed instructions are in [Section IX](#) of this NOFO.

D. Submission Dates and Times

1. Letter of Intent Due Date

Not Applicable

2. Pre-application Due Date

The pre-application due date is printed on the cover of this NOFO.

You are encouraged to submit your pre-application well before the deadline. Pre-applications may be submitted at any time between the publication of this NOFO and the stated deadline.

3. Application Due Date

The application due date is printed on the cover of this NOFO.

You are encouraged to submit your application well before the deadline. Applications may be submitted at any time between the publication of this NOFO and the stated deadline.

4. Late Submissions

Delays in submitting letters of intent, pre-applications, and applications may be unavoidable. DOE has accepted late submissions when applicants have been unable to make timely submissions because of widespread technological disruptions or significant natural disasters. DOE has made accommodations for incapacitating or life-threatening illnesses and for deaths of immediate family members. Other circumstances may or may not justify late submissions. Unacceptable justifications include 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 Program Office/Manager listed in this NOFO to discuss the option of a late submission. Contacting the Program Office/Manager after the deadline may reduce the likelihood that a request will be granted.

DOE notes that not all requests for late submission will be approved.

VI. Application Review Information

A. Responsiveness Review

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 NOFO, including LOIs or pre-applications, has been submitted; (3) all mandatory requirements are satisfied; (4) the proposed project is responsive to the objectives of the NOFO; and (5) the proposed project is not duplicative of programmatic work.

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

B. Review Criteria

Applications will be subjected to scientific merit review (peer review) and will be evaluated against the following criteria, listed in descending order of importance, as found in 10 CFR 605.10 (d), the Office of Science Financial Assistance Program Rule.

- 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 Budget; and
- Quality and Efficacy of the Promoting Inclusive and Equitable Research (PIER) Plan

Note that external peer reviewers are selected regarding 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.

The questions below are provided to the merit reviewers to elaborate the criteria established by regulation:

1. Scientific and/or Technical Merit of the Project

- What is the scientific innovation of the proposed research?
- What is the likelihood of achieving valuable results?
- How might the results of the proposed work impact the direction, progress, and thinking in relevant scientific fields of research?
- How does the proposed work compare with other efforts in its field, both in terms of scientific and/or technical merit and originality?
- Does the application specify at least one scientific hypothesis motivating the proposed work? Is the investigation of the specified hypothesis or hypotheses scientifically valuable?
- Is the Data Management Plan suitable for the proposed research? To what extent does it support the validation of research results? To what extent will research products, including data, be made available and reusable to advance the field of research?

2. Appropriateness of the Proposed Method or Approach

- How logical and feasible are the research approaches?
- Does the proposed research employ innovative concepts or methods?
- Can the approach proposed concretely contribute to our understanding of the validity of the specified scientific hypothesis or hypotheses?
- Are the conceptual framework, methods, and analyses well justified, adequately developed, and likely to lead to scientifically valid conclusions?
- Does the applicant recognize significant potential problems and consider alternative strategies?
- Is the proposed research aligned with the published priorities identified or incorporated by reference in Section I of this NOFO?

3. Competency of Applicant's Personnel and Adequacy of Proposed Resources

- How well qualified is the research team to carry out the proposed research?
- Are the research environment and facilities adequate for performing the research?
- Does the proposed work take advantage of unique facilities and capabilities?

4. Reasonableness and Appropriateness of the Proposed Budget

- Are the proposed budget and staffing levels adequate to carry out the proposed research?
- Is the budget reasonable and appropriate for the scope?

5. Quality and Efficacy of the Promoting Inclusive and Equitable Research Plan

- How well integrated is the Promoting Inclusive and Equitable Research (PIER) Plan with the proposed project?
- What aspects of the PIER plan are likely to contribute to the goal of creating and maintaining an equitable, inclusive, encouraging, and professional training and research environment and supporting a sense of belonging among project personnel?
- How does the proposed plan include intentional mentorship of project personnel?
- How are the proposed resources and budget for the PIER Plan reasonable and appropriate?
- To what extent is the PIER plan likely to lead to participation of individuals from diverse backgrounds, including individuals historically underrepresented in the research community?

C. Review and Selection Process

1. Merit Review

Applications that pass the initial review will be subjected to a formal merit review and will be evaluated based on the criteria codified at 10 CFR 605.10(d) in accordance with the guidance provided in the "Office of Science Merit Review System for Financial Assistance," which is available at: <https://science.osti.gov/grants/policy-and-guidance/merit-review-system/>.

2. Program Policy Factors

The Selection Official may consider any of the following program policy factors in making the selection, listed in no order of significance:

- Availability of funds
- Relevance of the proposed activity to SC priorities
- Ensuring an appropriate balance of activities within SC programs
- Performance under current awards
- Commitment to sharing the results of research
- Promoting the diversity of supported investigators
- Promoting the diversity of institutions receiving awards
- Increasing participation of institutions historically underrepresented in the SC research portfolio
- Promoting PIs with a commitment to improving diversity, equity, and inclusion in the science, technology, engineering, and math (STEM) community

3. Selection

The Selection Official will consider the findings of the merit review and may consider any of the Program Policy Factors described above and/or the review of risk described below.

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.

D. Risk Review

Pursuant to 2 CFR 200.206, DOE will conduct a review of any potential risks posed by the applicant. Such review of risk will include:

- Quality of the application
- Reports and findings from audits performed under 2 CFR 200 and/or 2 CFR 910, 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.

DOE may incorporate specific award conditions of a programmatic and/or administrative nature if an applicant exhibits one or more high-risk factors under 2 CFR 200.208.

The result(s) of any pre-award review of risk may supersede the results of merit review under 2 CFR 200.205, preventing DOE from selecting an application for award, requiring DOE to reverse a selection for award, or requiring the disengagement of specific personnel. The results of any post-award review of risk may result in requiring the disengagement of specific personnel, the imposition of other requirements, or the termination of an award that “no longer effectuates the program goals or agency priorities” under 2 CFR 200.340(a)(2). 2 CFR 200.206(c).

Pursuant to 2 CFR 910.128, the results of any pre-award review of risk are not appealable. Any pre-award decision to not select an application for award, reverse a selection for award, or require the disengagement of specific personnel will be made by the Selection Official or SC Program Official. Pursuant to 2 CFR 910.128, the results of any post-award review of risk may be appealable. Any post-award decision to require the disengagement of specific personnel, the imposition of other requirements, or the termination of an award will be made by the Contracting Officer.

DOE may conduct a review, through Government resources, of the applicant and project personnel with a connection to a foreign country. This includes, but is not limited to, (1) performance of work in, (2) travel to, and (3) awardee personnel’s higher education in a foreign Country, as well as (4) partnerships with international collaborators. As part of the research, technology, and economic security risk review, DOE may contact the applicant and/or proposed project team members for additional information to inform the review.

VII. Award Notices

A. Type of Award Instrument

DOE anticipates awarding grants under this NOFO.

Multi-institutional teams must apply using a prime and subaward model with one application submitted by the lead institution.

B. Anticipated Timeline for Notice of Selection for Award Negotiation

It is anticipated that the award selection will be completed by June 2025. It is expected that awards will be made in Fiscal Year 2025.

DOE is interested in seeing projects supported under this NOFO begin work by August 2025.

1. Notice of Selection for Award Negotiation

Applicants Selected for Award Negotiation Notification: DOE will notify applicants selected for award negotiation. This notice of selection for award negotiation is not an authorization for the applicant/recipient to begin performance.

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

An Assistance Agreement issued by the DOE 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) Intellectual Property Provisions, (3) Federal Assistance Reporting Checklist and Instructions, (4) Budget Pages, (5) The Research Terms and Conditions, available at https://www.nsf.gov/pubs/policydocs/rtr/rcoverlay_march17.pdf, and DOE Agency Specific Requirements, available at <https://www.nsf.gov/awards/managing/rtr.jsp>, (6) Applicable program regulations, 10 CFR 605 at <https://www.ecfr.gov/>, (7) DOE Assistance Regulations, 2 CFR 200 as amended by 2 CFR 910 at <https://www.ecfr.gov/>, (8) Application/proposal as approved by DOE, (9) National Policy Assurances to Be Incorporated as Award Terms in effect on date of award at <https://www.nsf.gov/awards/managing/rtr.jsp>.

TERMS AND CONDITIONS

Sample DOE Special Terms and Conditions for Use in Most Grants and Cooperative Agreements are located at <https://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:

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

NATIONAL POLICY ASSURANCES

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

VIII. Post-Award Requirements and Administration

A. Administrative and National Policy Requirements

Additional policy provisions applicable to this NOFO are included in the list below. Awards made under this NOFO are subject to the respective Administrative and National Policy Requirements. The full text of each provision is in [Section IX](#) of this NOFO and may be accessed by navigating to the hyperlinks below:

- [1. Administrative Requirements](#)
- [2. Availability of Funds](#)
- [3. Buy America Requirement for Infrastructure Projects](#)
- [4. Conference Spending \(February 2015\)](#)
- [5. Commitment of Public Funds](#)
- [6. Corporate Felony Conviction and Federal Tax Liability Representations \(March 2014\)](#)
- [7. Digital Persistent Identifier \(PID\)](#)
- [8. Environmental, Safety and Health \(ES&H\) Performance of Work at DOE Facilities](#)
- [9. Evaluation and Administration by Non-Federal Personnel](#)
- [10. Federal, State, and Local Requirements](#)
- [11. Foreign Travel](#)
- [12. Funding Restrictions](#)
- [13. Government Right to Reject or Negotiate](#)
- [14. Intergovernmental Review](#)
- [15. Living Wages](#)
- [16. Logos and Wordmarks](#)
- [17. Modifications](#)
- [18. National Environmental Policy Act \(NEPA\) Compliance](#)
- [19. Nondisclosure and Confidentiality Agreements Representations \(June 2015\)](#)
- [20. Notice Regarding Eligible/Ineligible Activities](#)
- [21. Portable Document Format \(PDF\) Generation](#)
- [22. Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment](#)
- [23. Prohibition on Discrimination and Harassment](#)
- [24. Prohibition on Entities of Concern](#)
- [25. Prohibition on Lobbying Activity](#)
- [26. Prohibition Related to Foreign Government-Sponsored Talent Recruitment Programs](#)
- [27. Proprietary Application Information](#)
- [28. Publications](#)
- [29. Registration Requirements](#)
- [30. Research Misconduct](#)
- [31. Research Security Training Requirement](#)
- [32. Rights in Technical Data](#)
- [33. SC Statement of Commitment](#)
- [34. Statement of Federal Stewardship](#)
- [35. Subaward and Executive Reporting](#)
- [36. Title to Subject Inventions](#)
- [37. Trafficking in Persons](#)
- [38. U.S. Competitiveness](#)

[39. Updating Your Portfolio Analysis and Management System \(PAMS\) Profile](#)

B. Reporting

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

C. Reporting of Matters Related to Recipient Integrity and Performance (December 2015)

DOE, prior to making a Federal award with a total amount of Federal share greater than the simplified acquisition threshold, is required to review and consider any information about the applicant that is in the designated integrity and performance system accessible through SAM (see 41 USC 2313).

The applicant, at its option, may review information in the designated integrity and performance systems accessible through SAM and comment on any information about itself that a Federal awarding agency previously entered and is currently in the designated integrity and performance system accessible through SAM.

DOE will consider any written comments by the applicant, in addition to the other information in the designated integrity and performance system, in making a judgment about the applicant's integrity, business ethics, and record of performance under Federal awards when completing the review of risk posed by applicants as described in 2 CFR 200.206 Federal awarding agency review of risk posed by applicants.

D. Interim Conflict of Interest Policy for Financial Assistance

1. Policy

The DOE interim Conflict of Interest Policy for Financial Assistance (COI Policy) can be found at <https://www.energy.gov/management/department-energy-interim-conflict-interest-policy-requirements-financial-assistance>. This policy is applicable to all non-Federal entities applying for, or that receive, DOE funding by means of a financial assistance award (e.g., a grant, cooperative agreement, or technology investment agreement) and, through the implementation of this policy by the entity, to each Investigator who is planning to participate in, or is participating in, the project funded wholly or in part under the DOE financial assistance award. DOE's interim COI Policy establishes standards that provide a reasonable expectation that the design, conduct, and reporting of projects funded wholly or in part under DOE financial assistance awards will be free from bias resulting from financial conflicts of interest or organizational conflicts of interest. The applicant is subject to the requirements of the interim COI Policy and within each application for financial assistance, the applicant must certify that it is or will be by the time of receiving any financial assistance award, compliant with all requirements in the interim COI

Policy. The applicant must flow down the requirements of the interim COI Policy to any subrecipient non-Federal entities.

2. SC Implementation

SC only requires that unmanaged or unmanageable financial conflicts of interest be included in the financial conflict of interest (FCOI) report.

IX. Other Information

A. Checklist for Avoiding Common Errors

Note that not all items in this checklist will apply to every submission under every NOFO.

| Item | Issue |
|-----------------------|--|
| Applications | Submitted in Grants.gov. Do not submit applications in PAMS or FedConnect. |
| Grants.gov Submission | <p>Ensure that applications are submitted under the correct Opportunity Number.</p> <p>Standard Form (SF)-424 Research and Related (R&R):</p> <ul style="list-style-type: none"> - Attach nothing to field 20 - Attach nothing to field 21 <p>SF-424 Research and Related Other Project Information form:</p> <ul style="list-style-type: none"> - Attach the abstract to field 7 - Attach the project narrative, with all appendices, to field 8 - Attach nothing to field 9 - Attach nothing to field 10 - Attach nothing to field 11 - Attach the list of individuals who should not serve as merit reviewers (Collaborator Template) to field 12 - Do not attach other files to field 12 - NOTE: Files attached to field 12 will not be shared with merit reviewers. |
| Pre-Applications | <ul style="list-style-type: none"> - Submit your pre-application in PAMS. - Do not submit your pre-application in Grants.gov. - Do not attach your pre-application to the SF-424 Research and Related (R&R) form. - Follow the instructions in Section IV for the preparation of a pre-application. |
| Page Limits | <p>Strictly followed throughout application, including particular attention to:</p> <ul style="list-style-type: none"> - Project narrative and appendices - Biographical sketches - Data Management Plans (DMPs) - PIER Plan - Letter(s) of Collaboration or Access, if any |

| Item | Issue |
|--|--|
| Personally Identifiable Information | None present in the application |
| Project Narrative | Composed of one PDF file including all appendices (bibliography, facilities, equipment, DMP, PIER) |
| Project Summary / Abstract | Name of PI, PI's institutional affiliation(s), Co-Investigator(s), Co-Investigator's institutional affiliation(s) |
| DOE Title Page | Follow instructions closely |
| Budget | Use current negotiated indirect cost and fringe benefit rates |
| Budget Justification (attached to budget) | Justify all requested costs |
| Biographical Sketches | Follow page limits strictly and do not include list of collaborators. Attach the biographical sketch to the Senior/Key Person Profile (Expanded) Form. |
| Current and Pending Support | Ensure complete listing of all activities, regardless of source of funding. Attach the current and pending support to the Senior/Key Person Profile (Expanded) Form. |
| List of Individuals who Should not Serve as Merit Reviews | Attach to field 12 of the SF-424 Research and Related Other Project Information form. |
| Data Management Plans (DMP) | <ul style="list-style-type: none"> - If referring to an experiment's DMP, describe the relationship to the proposed research. - Include a DMP even if no experimental data is expected. |
| Promoting Inclusive and Equitable Research (PIER) Plan | PIER Plans are required for all applications. |
| Institutions capable of being funded through the DOE Field Work System | <p>If National Laboratories and/or DOE sites are permitted to submit under this NOFO:</p> <ul style="list-style-type: none"> - Do not create new institutions in the PAMS website. - Submit applications in Grants.gov using the name of the laboratory or site in Field 5 of the SF-424(R&R) application form, not the contractor operating the laboratory or site. <p>Submissions under this NOFO will be evaluated for technical merit, but any resulting funding, work, or awards will be made under the laboratory or site's contract with DOE. No separate financial assistance awards will be made. No administrative</p> |

| Item | Issue |
|------|---|
| | provisions of this NOFO will apply to the laboratory or any laboratory subcontractor. |

B. How-To Guides

The how-to guides provided in this section are intended as general guidance about SC. Not all parts will be applicable to every NOFO, every application, or every institution.

1. How to Distinguish Between a New and Renewal Application

New Application: An application must be submitted as “new” in the following circumstances:

- When applying for funding to create a new research award that has not previously received DOE funding, including any funding for the current year,
- When applying for funding to support continued research from the same applicant institution as the current grant but with a significant change in fundamental nature of the research, or
- When applying for funding to support continued research supported by an existing DOE award but at a new applicant institution.

Renewal Application: A renewal application is appropriate when funds are requested for an award from the same recipient/applicant institution that has no significant changes in the following items:

- The award’s senior leadership, and
- The fundamental nature of the award.

A change in an award’s PI does not necessarily require submission as a new application: The change in personnel must be considered in light of other changes.

Renewal applications compete for funds with all other peer-reviewed applications and must be developed as fully as though the applicant were applying for the first time. Renewal applications must be submitted by the same sponsoring institution as that holding the current award for which renewal funding is requested, and the proposed research topic must be logical scientific extensions of the research that has been performed in the current award.

2. How Federally Affiliated Organizations May Participate and Be Funded

VALUE/FUNDING FOR DOE/NNSA NATIONAL LABORATORIES AND NON-DOE/NNSA FFRDCS

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

RESPONSIBILITY

The successful prime applicant/recipient (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 subrecipient.

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 management and operating (M&O) contract, as applicable, in consultation between DOE and the prime recipient.

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

3. How Federally Affiliated Organizations May Apply

DOE/NNSA NATIONAL LABORATORIES

DOE/NNSA National Laboratories, if eligible either as a prime applicant or a proposed team member on another entity's application, should ensure that their cognizant DOE/NNSA Contracting Officer provides written authorization. This authorization should be submitted with the application as part of the Budget Justification for DOE/NNSA National Laboratory Contractor File. [This is not required for the National Energy Technology Laboratory because it is a Government Owned/Government Operated (GOGO) Laboratory.] **Please note that failure to provide this authorization may result in rejection of an application prior to merit review.** If a DOE/NNSA National Laboratory Contractor is selected for award, or proposed as a team member, the proposed work will be authorized under the DOE field work authorization system or other appropriate process and performed under the laboratory Contractor's M&O contract, as applicable. The authorization may be addressed "To Whom It May Concern:". 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."

(End of acceptable authorization)

If a DOE/NNSA FFRDC is selected for award negotiation, the proposed work will be authorized under the DOE work authorization process and performed under the laboratory's Management and Operating (M&O) contract.

NON-DOE/NNSA FFRDCs

Non-DOE/NNSA FFRDCs, if eligible either as a prime applicant or a proposed team member on another entity's application, should follow the following guidelines:

The prime applicant must obtain written authorization for non-DOE/NNSA FFRDC participation. The cognizant Contracting Officer for the Federal agency sponsoring the FFRDC contractor must authorize in writing the participation of the FFRDC contractor on the proposed project and this authorization should be submitted with the application. The written authorization must also contain a determination that the use of a FFRDC contractor is consistent with the contractor's authority under its award and does not place the FFRDC contractor in direct competition with the private sector, in accordance with FAR Part 17.5. **Please note that failure to provide this authorization may result in rejection of an application prior to merit review.** The authorization may be addressed "To Whom It May Concern:". 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 <<Include the NOFO number on the cover page>> by the following statutory authority (insert statute name, citation, and section)."

(End of acceptable authorization)

OTHER FEDERAL AGENCIES

Other Federal Agencies, if eligible either as a prime applicant or a proposed team member on another entity's application, must include in their budget justifications any specific statutory authorization (other than the Economy Act) that permits their receipt of an interagency agreement or that authorizes the payment of certain costs.

4. How Consortia May be Used

INCORPORATED CONSORTIA

Incorporated consortia are eligible to apply for funding as a prime recipient (lead organization) or subrecipient (team member).

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. There is no requirement that subawards be formalized into incorporated consortia.

UNINCORPORATED CONSORTIA

Unincorporated consortia (team arrangements) must designate one member of the consortium to serve as the prime recipient/consortium representative (lead organization). There is no requirement that subawards be formalized into unincorporated consortia.

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 (though neither required nor considered)
- Provisions for ownership and rights in intellectual property developed previously or under the agreement

Note that a consortium is applied for in one application and results in one award with subawards to consortia members. Multi-institutional teams may, if permitted under this NOFO, submit collaborative applications with each institution submitting its own application with an identical project narrative, resulting in multiple awards to the collaborating institutions.

5. How to Submit Letters of Intent

Do not submit an LOI unless a NOFO requires or allows their submission.

It is important that the LOI be a single file with extension .pdf, .docx, or .doc. The filename must not exceed 50 characters. The PI and anyone submitting on behalf of the PI must register for an account in PAMS before it will be possible to submit a LOI. **All PIs and those submitting LOIs on behalf of PIs are encouraged to establish PAMS accounts as soon as possible to avoid submission delays.**

Submit Your Letter of Intent:

- Create your LOI outside the system and save it as a file with extension .docx, .doc, or .pdf. Make a note of the location of the file on your computer so you can browse for it later from within PAMS.
- Log into PAMS and click the Proposals tab. Click the "View / Respond to Funding Opportunity Announcements" link and find the current announcement in the list. Click the "Actions/Views" link in the Options column next to this announcement to obtain a dropdown menu. Select "Submit Letter of Intent" from the dropdown.
- On the Submit Letter of Intent page, select the institution from which you are submitting this LOI from the Institution dropdown. If you are associated with only one institution in the system, there will only be one institution in the dropdown.
- Note that you must select one and only one PI per LOI; to do so, click the "Select PI" button on the far-right side of the screen. Find the appropriate PI from the list of all registered users

from your institution returned by PAMS. (Note: You may have to sort, filter, or search through the list if it has multiple pages.) Click the “Actions” link in the Options column next to the appropriate PI to obtain a dropdown menu. From the dropdown, choose “Select PI.”

- If the PI for whom you are submitting does not appear on the list, it means he or she has not yet registered in PAMS. For your convenience, you may have PAMS send an email invitation to the PI to register in PAMS. To do so, click the “Invite PI” link at the top left of the “Select PI” screen. You can enter an optional personal message to the PI in the “Comments” box, and it will be included in the email sent by PAMS to the PI. You must wait until the PI registers before you can submit the LOI. Save the LOI for later work by clicking the “Save” button at the bottom of the screen. It will be stored in “My Letters of Intent” for later editing.
- Enter a title for your LOI.
- Select the appropriate technical contact from the Program Manager dropdown.
- To upload the LOI file into PAMS, click the “Attach File” button at the far-right side of the screen. Click the “Browse” (or “Choose File” depending on your browser) button to search for your file. You may enter an optional description of the file you are attaching. Click the “Upload” button to upload the file.
- At the bottom of the screen, click the “Submit to DOE” button to save and submit the LOI to DOE.
- Upon submission, the PI will receive an email from the PAMS system <PAMS.Autoreply@science.doe.gov> acknowledging receipt of the LOI.
- If this NOFO requires that LOIs be submitted only by an authorized institutional official, the PI (or the PI’s delegate) will only be able to send the LOI to a user at the PI’s institution with the institutional “submit to DOE” privilege. That user will then apply an institutional countersignature to the LOI when it is sent to DOE.

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

WARNING: The PAMS website at <https://pamspublic.science.energy.gov/> will permit you to revise a previously submitted LOI in the time between your submission and the deadline. Doing so will remove your previously submitted version from consideration. If you have not submitted the revision at the time of the deadline, you will not have a valid submission. Please pay attention to the deadline.

Do not attach pre-applications to Field 20 of the SF-424(R&R) form or letters of intent to Field 21 of the SF-424(R&R) form. Doing so will render your application unreadable.

6. How to Submit a Pre-Application

Do not submit a pre-application unless a NOFO requires or permits their submission.

It is important that the pre-application be a single file with extension .pdf, .docx, or .doc. The filename must not exceed 50 characters. The PI and anyone submitting on behalf of the PI 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.

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 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.
- If this NOFO requires that pre-applications be submitted only by an authorized institutional official, the PI (or the PI’s delegate) will only be able to send the pre-application to a user at the PI’s institution with the institutional “submit to DOE” privilege. That user will then apply an institutional countersignature to the pre-application when it is sent to DOE.

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.

WARNING: The PAMS website at <https://pamspublic.science.energy.gov> will permit you to revise a previously submitted pre-application in the time between your submission and the deadline. Doing so will remove your previously submitted version from consideration. If you have not submitted the revision at the time of the deadline, you will not have a valid submission. Please pay attention to the deadline.

Do not attach pre-applications to Field 20 of the SF-424(R&R) form or letters of intent to Field 21 of the SF-424(R&R) form. Doing so will render your application unreadable.

7. How to Register and Submit an Application in Grants.gov

This section provides the application submission and receipt instructions for applications to SC. Please read the following instructions carefully and completely.

ELECTRONIC DELIVERY

SC is participating in the Grants.gov initiative to provide the grant community with a single site to find and apply for grant funding opportunities. SC requires applicants to submit their applications online through Grants.gov.

HOW TO REGISTER TO APPLY THROUGH GRANTS.GOV

- a. **Instructions:** Read the instructions below about registering to apply for SC funds. Applicants should read the registration instructions carefully and prepare the information requested before beginning the registration process. Reviewing and assembling the required information before beginning the registration process will alleviate last-minute searches for required information.

Organizations must have an active System for Award Management (SAM) registration which provides a Unique Entity Identifier (UEI), and Grants.gov account to apply for grants. If individual applicants (those submitting on their own behalf) are eligible to apply for this funding opportunity, they need only refer to steps 2 and 3 below.

Creating a Grants.gov account can be completed online in minutes, but SAM registration may take several weeks. Therefore, an organization's registration should be done in sufficient time to ensure it does not impact the entity's ability to meet required application submission deadlines.

- 1) *Register with SAM:* All organizations applying online through Grants.gov must register with SAM at <https://www.sam.gov>. Failure to register with SAM will prevent your organization from applying through Grants.gov. SAM registration must be renewed annually. For more detailed instructions for registering with SAM, refer to: <https://www.grants.gov/applicants/applicant-registration/>
- 2) *Create a Grants.gov Account:* The next step is to register an account with Grants.gov. Follow the on-screen instructions provided on the registration page.

3) *Add a Profile to a Grants.gov Account*: A profile in Grants.gov corresponds to a single applicant organization the user represents (i.e., an applicant) or an individual applicant. If you work for or consult with multiple organizations and have a profile for each, you may log in to one Grants.gov account to access all of your grant applications. To add an organizational profile to your Grants.gov account, enter the UEI (Unique Entity Identifier) for the organization in the UEI field. If you are an individual applicant submitting on your own behalf, you do not need a UEI to add the profile. For more detailed instructions about creating a profile on Grants.gov, refer to:
<https://www.grants.gov/applicants/applicant-registration/add-profile>

4) *EBiz POC Authorized Profile Roles*: After you register with Grants.gov and create an Organization Applicant Profile, the organization applicant's request for Grants.gov roles and access is sent to the Electronic Business Point of Contact (EBiz POC)¹¹. The EBiz POC will then log in to Grants.gov and authorize the appropriate roles, which may include the Authorized Organization Representative (AOR) role, thereby giving you permission to complete and submit applications on behalf of the organization. You will be able to submit your application online any time after you have been assigned the AOR role. For more detailed instructions about creating a profile on Grants.gov, refer to:
<https://www.grants.gov/applicants/applicant-registration/ebiz-poc-authorizes-profile-roles>

5) *Track Role Status*: To track your role request, refer to:
<https://www.grants.gov/applicants/applicant-registration/track-profile-role-status>

b. **Electronic Signature**: When applications are submitted through Grants.gov, the name of the organization applicant with the AOR role that submitted the application is inserted into the signature line of the application, serving as the electronic signature. The EBiz POC **must** authorize people who are able to make legally binding commitments on behalf of the organization as a user with the AOR role; **this step is often missed and it is crucial for valid and timely submissions.**

HOW TO APPLY TO SC VIA GRANTS.GOV

Grants.gov applicants can apply online using Workspace. Workspace is a shared, online environment where members of a grant team may simultaneously access and edit different webforms within an application. For each NOFO, you can create individual instances of a workspace.

For an overview of applying on Grants.gov using Workspaces, refer to:
<https://www.grants.gov/applicants/workspace-overview/>

¹¹ Individuals with the EBiz POC role are commonly found in an Office of Sponsored Research or similar institutional business office. Other than small businesses, a PI would usually not have the EBiz POC role.

- 1) Create a Workspace: Creating a workspace allows you to complete it online and route it through your organization for review before submitting.
- 2) Complete a Workspace: Add participants to the workspace to work on the application together, complete all the required forms online or by downloading PDF versions, and check for errors before submission. The Workspace progress bar will display the state of your application process as you apply. As you apply using Workspace, you may click the blue question mark icon near the upper-right corner of each page to access context-sensitive help.

- a. Adobe Reader: If you decide not to apply by filling out webforms you can download individual PDF forms in Workspace so that they will appear similar to other Standard forms. The individual PDF forms can be downloaded and saved to your local device storage, network drive(s), or external drives, then accessed through Adobe Reader.

NOTE: Visit the Adobe Software Compatibility page on Grants.gov to download the appropriate version of the software at: <https://www.grants.gov/applicants/adobe-software-compatibility>

- b. Mandatory Fields in Forms: In the forms, you will note fields marked with an asterisk and a different background color. These fields are mandatory fields that must be completed to successfully submit your application.
 - c. Complete SF-424 Fields First: These forms are designed to fill in common required fields across other forms, such as the applicant's name, address, and SAM UEI. Once it is completed, the information will transfer to the other forms.
- 3) Submit a Workspace: An application may be submitted through workspace by clicking the Sign and Submit button on the Manage Workspace page, under the Forms tab. Grants.gov recommends submitting your application package *at least 24-48 hours prior to the close date* to provide you with time to correct any potential technical issues that may disrupt the application submission.
 - 4) Track a Workspace: After successfully submitting a workspace package, a Grants.gov Tracking Number (GRANTXXXXXXXX) is automatically assigned to the package. The number will be listed on the Confirmation page that is generated after submission.

For additional training resources, including video tutorials, refer to: <https://www.grants.gov/applicants/applicant-training>

Applicant Support: Grants.gov provides applicants 24/7 support via the toll-free number 1-800-518-4726 and email at support@Grants.gov. For questions related to the specific grant opportunity, contact the number listed in the application package of the grant you are applying for funding.

If you are experiencing difficulties with your submission, it is best to call the Grants.gov Support Center and get a ticket number. The Support Center ticket number will assist SC with tracking

your issue and understanding background information on the issue.

TIMELY RECEIPT REQUIREMENTS AND PROOF OF TIMELY SUBMISSION

Proof of timely submission is automatically recorded by Grants.gov. An electronic date/time stamp is generated within the system when the application is successfully received by Grants.gov. The applicant AOR will receive an acknowledgement of receipt and a tracking number (GRANTXXXXXXXX) from Grants.gov with the successful transmission of their application. Applicant AORs will also receive the official date/time stamp and Grants.gov Tracking number in an email serving as proof of their timely submission.

When SC successfully retrieves the application from Grants.gov, and acknowledges the download of submissions, Grants.gov will provide an electronic acknowledgment of receipt of the application to the email address of the applicant with the AOR role. Again, proof of timely submission shall be the official date and time that Grants.gov receives your application. Applications received by Grants.gov after the established due date for the program will be considered late and may not be considered for funding by SC.

Applicants using unreliable internet connections should be aware that the process of completing the Workspace can take some time. Therefore, applicants should allow enough time to prepare and submit the application before the package closing date.

Grants.gov will provide either an error or a successfully received submission message in the form of an email sent to the applicant with the AOR role attempting to submit the application.

If you do not promptly receive an email from Grants.gov with an agency tracking number, indicating receipt of the application by SC, please contact the Grants.gov Helpdesk at 800-518-4726 (toll-free) or support@Grants.gov immediately. SC will have no records of your attempted submission without the second email from Grants.gov.

8. How to Prepare an Application

APPLICATION PREPARATION

You must submit the application through Grants.gov at <https://www.Grants.gov/>, using either the online webforms or downloaded forms. (Additional instructions are provided [above](#).)

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 software compatibility page at <https://www.Grants.gov/web/grants/applicants/adobe-software-compatibility.html>.

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 PDF files unless otherwise specified in this NOFO. 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 the following restrictions that apply to the names of all files attached to your application:

- Please limit file names to 50 or fewer characters.
- Do not attach any documents with the same name. All attachments must have a unique name.
- Please use only the following characters when naming your attachments: A-Z, a-z, 0-9, underscore, hyphen, space, period, parenthesis, curly braces, square brackets, ampersand, tilde, exclamation point, comma, semi colon, apostrophe, at sign, number sign, dollar sign, percent sign, plus sign, and equal sign. Attachments that do not follow this rule may cause the entire application to be rejected or cause issues during processing.

RENEWAL APPLICATIONS

For renewal applications only, the PI is required to submit a Renewal Proposal Products section through the PAMS website at <https://pamspublic.science.energy.gov>. The PI must enter into PAMS each product created during the course of the previous project period. Types of products include publications, intellectual property, technologies or techniques, and other products such as databases or software. As soon as the renewal application is assigned to a DOE Program Manager, the PI will receive an automated email from PAMS (<PAMS.Autoreply@science.doe.gov>) instructing him or her to navigate to the PAMS Task tab to complete and submit the Renewal Proposal Products. The submitted product list will be sent for merit review as part of the application. The application will not be considered complete and cannot be sent for review until the product list has been submitted.

RESUBMISSION OF APPLICATIONS

Applications submitted under this NOFO may be withdrawn from consideration by using the PAMS website at <https://pamspublic.science.energy.gov>. Applications may be withdrawn at any time between when the applicant submits the application and when DOE makes the application available to merit reviewers. Such withdrawals take effect immediately and cannot be reversed. Please exercise due caution. After the application is made available to merit reviewers, the applicant may contact the DOE program office identified in this NOFO to request that it be withdrawn.

After an application is withdrawn, it may be resubmitted, if this NOFO is still open for the submission of applications. Such resubmissions will only count as one submission if this NOFO restricts the number of applications from an applicant.

Note that there may be a delay between the application's submission in Grants.gov and when it is available to be withdrawn in PAMS. SC will usually consider the last submission, according to its Grants.gov timestamp, to be the intended version. Please consult with your program manager to resolve any confusion about which version of an application should be considered.

IMPROPER CONTENTS OF APPLICATIONS

Applications submitted under this NOFO will be stored in controlled-access systems, but they may be made publicly available if an award is made. As such, it is critical that applicants follow these guidelines:

- Do not include information that a non-Federal entity may not openly distribute, whether classified, export control, or unclassified controlled nuclear information. Non-Federal entities are not subject to any restrictions on distributing controlled unclassified information (CUI).
- Do not include sensitive and protected personally identifiable information, including social security numbers, birthdates, citizenship, marital status, or home addresses. Pay particular attention to the content of biographical sketches and curriculum vitae.
- Do not include letters of support from Federal officials.
- Do not include letters of support on Federal letterhead. Letters that are not letters of support (such as letters confirming access to sites, facilities, equipment, or data; or letters from cognizant Contracting Officers) may be on Federal letterhead.
- Clearly mark all proprietary or trade-secret information.

CHANGE OF RECIPIENT INSTITUTION

If a recipient chooses to relinquish an award made under this NOFO to permit the transfer of the award to a new institution, the new institution must apply under the then-available SC “annual” or “open” NOFO.

9. How to Prepare a Biographical Sketch

A biographical sketch is to provide information that can be used by reviewers to evaluate the PI’s potential for leadership within the scientific community. Examples of information of interest are invited and/or public lectures, awards received, scientific program committees, conference or workshop organization, professional society activities, special international or industrial partnerships, reviewing or editorship activities, or other scientific leadership experiences.

SC requires the use of the format approved by the National Science Foundation (NSF), which may be generated by the Science Experts Network Curriculum Vitae (SciENCv), a cooperative venture maintained at <https://www.ncbi.nlm.nih.gov/sciencv/>. The fillable PDFs provided by the National Science Foundation are no longer available. SciENCv has been updated to meet the interagency common format biographical sketches.

The biographical information (curriculum vitae) must include the following items within its page limit:

- **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 professional/academic positions in chronological order with a brief description. List all current academic, professional or institutional appointments, foreign or domestic, at the applicant institution or elsewhere, whether remuneration is received, and, whether full-

time, part-time, or voluntary.

- **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. An abbreviated style such as the Physical Review Letters (PRL) convention for citations (list only the first author) may be used for publications with more than 10 authors.

Requested information may be appended to a biographical sketch, whether produced from a fillable PDF or in SciENcv.

Do not attach a listing of individuals who should not be used as merit reviewers: This information is no longer collected as part of a biographical sketch.

SC strongly recommends the use of SciENcv to reduce administrative burden by allowing the use of digital persistent identifiers, including the Open Researcher and Contributor ID (ORCID). If not using SciENcv, append the following signed and dated certification to a biographical sketch:

I, [Full Name and Title], certify to the best of my knowledge and belief that the information contained in this Current and Pending Support Disclosure Statement is true, complete, and accurate. I understand that any false, fictitious, or fraudulent information, misrepresentations, half-truths, or omissions of any material fact, may subject me to criminal, civil or administrative penalties for fraud, false statements, false claims or otherwise. (18 U.S.C. §§ 1001 and 287, and 31 U.S.C. 3729-3733 and 3801-3812). I further understand and agree that (1) the statements and representations made herein are material to DOE's funding decision, and (2) I have a responsibility to update the disclosures during the period of performance of the award should circumstances change which impact the responses provided above.

Biographical sketches must be attached to the Research and Related Senior/Key Person Profile (Expanded) form in an application.

Personally Identifiable Information: Do not include sensitive and protected personally identifiable information including social security numbers, birthdates, citizenship, marital status, or home addresses. Do not include information that a merit reviewer should not make use of.

10. How to Prepare a List of Individuals Who Should Not Serve as Reviewers

To assist in identifying individuals who should not serve as merit reviews, provide the following information for each senior/key person who is planned to be or is identified in Section A of the R&R Budget for the applicant and any proposed subrecipients:

- Advisees (graduate students or postdocs) of the senior/key person
- Advisors of the senior/key person while a graduate student or a postdoc

- Close associates of the senior/key person over the past 48 months
- Co-authors of the senior/key person over the past 48 months
- Co-editors of the senior/key person over the past 48 months
- Co-investigators of the senior/key person over the past 48 months
- Collaborators of the senior/key person over the past 48 months

Do not identify any personnel at the applicant institution or any proposed subrecipient or team institution: Those personnel are prohibited from serving as merit reviewers.

Large collaborations of 10 or more researchers do not require that all collaborators be identified: rather, only list the researchers with whom the senior/key person collaborated.

For all identified individuals, provide the following information:

- The senior/key person to whom the individual was an advisee, advisor, close associate, co-author, co-editor, co-investigator, or collaborator, identified by first name and last name
- The individual's first (given) name
- The individual's last (family) name
- The individual's Open Researcher and Contributor ID (ORCID), if known
- The individual's institutional affiliation spelling out acronyms (For joint appointments, separate each institution with a slash ("/"). Do not list departmental affiliations.)
- The reason for listing the individual (advisee, advisor, close associate, co-author, co-editor, co-investigator, collaborator)
- The year when the individual last was a close associate, co-author, co-editor, co-investigator, or collaborator

You may also provide a list of all senior/key personnel who are planned to be or are identified in Section A of the R&R Budget for the applicant and any proposed subrecipients.

The lists do not need to be sorted in any method.

The lists must be submitted in tabular format, preferably as Microsoft Excel (.xls or .xlsx) files.

For your convenience, a Collaborator Template is available at <https://science.osti.gov/grants/Policy-and-Guidance/Agreement-Forms>. The template may also be posted with this NOFO in Grants.gov. If using the template:

- Do not add tabs to the spreadsheet
- Do not merge the existing tabs
- Do not remove headers
- Fill out the requested headers on both tabs with the same information
- Ensure that given and family names are presented in the correct columns

11. How to Prepare Current and Pending Support

WARNING: These instructions have been significantly revised to require disclosure of a variety of potential conflicts of interest or commitment, including participation in foreign government-sponsored talent recruitment programs.

Current and Pending support is intended to allow the identification of potential duplication, overcommitment, potential conflicts of interest or commitment, and all other sources of support. The PI and each senior/key person at the prime applicant and any proposed subaward must provide a list of all sponsored activities, awards, and appointments, whether paid or unpaid; provided as a gift with terms or conditions or provided as a gift without terms or conditions; full-time, part-time, or voluntary; faculty, visiting, adjunct, or honorary; cash or in-kind; foreign or domestic; governmental or private-sector; directly supporting the individual's research or indirectly supporting the individual by supporting students, research staff, space, equipment, or other research expenses. Include the current application and any application submitted to any source of funding in a list of current and pending support. All sources of support must be disclosed, but for work that is subject to government classification or enforceable non-disclosure agreements, the general area of the research should be described without disclosing sensitive details and the sponsor should be listed as "Government Agency" or "private sponsor." All foreign government-sponsored talent recruitment programs must be identified in current and pending support.

SC requires the use of the format approved by the National Science Foundation (NSF), which may be generated by the Science Experts Network Curriculum Vitae (SciENCv), a cooperative venture maintained at <https://www.ncbi.nlm.nih.gov/sciencv/>. The fillable PDFs provided by the National Science Foundation are no longer available. SciENCv has been updated to meet the interagency common format for current and pending support.

For every activity, list the following items:

- The sponsor of the activity or the source of funding.
- The award or other identifying number.
- The title of the award or activity. If the title of the award or activity is not descriptive, add a brief description of the research being performed that would identify any overlaps or synergies with the proposed research.
- 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.
- The award period (start date – end date).
- The person-months of effort per year being dedicated to the award or activity.

If required to identify overlap, duplication of effort, or synergistic efforts, append a description of the other award or activity to the current and pending support.

SC strongly recommends the use of SciENCv to reduce administrative burden by allowing the use of digital persistent identifiers, including the Open Researcher and Contributor ID (ORCID). If not using SciENCv, append the following signed and dated certification to current and pending support:

I, [Full Name and Title], certify to the best of my knowledge and belief that the information contained in this Current and Pending Support Disclosure Statement is true, complete, and accurate. I understand that any false, fictitious, or fraudulent information, misrepresentations, half-truths, or omissions of any material fact, may subject me to

criminal, civil or administrative penalties for fraud, false statements, false claims or otherwise. (18 U.S.C. §§ 1001 and 287, and 31 U.S.C. 3729-3733 and 3801-3812). I further understand and agree that (1) the statements and representations made herein are material to DOE's funding decision, and (2) I have a responsibility to update the disclosures during the period of performance of the award should circumstances change which impact the responses provided above.

Current and pending support must be attached to the Research and Related Senior/Key Person Profile (Expanded) form in an application.

Details of any obligations, contractual or otherwise, to any program, entity, or organization sponsored by a foreign government must be provided on request to either the applicant institution or DOE.

12. How to Prepare a Data Management Plan

In general, a DMP should address 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 (<https://science.osti.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 at <https://science.osti.gov/user-facilities/>.
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 SC research proposal merit review process. Applicants are encouraged to consult the SC website for further information and suggestions for how to structure a DMP: <https://science.osti.gov/funding-opportunities/digital-data-management>

13. How to Prepare a Research and Related Budget and Justification

The following advice will improve the accuracy of your budget request:

- Funds requested for personnel (senior, key, and other) must be justified as the product of their effort on the project and their institutional base salary.
- Funds requested for fringe benefits must be calculated as the product of the requested salary and, if present, the negotiated fringe benefit rate contained in an institution’s negotiated indirect cost rate agreement.
- Funds requested for indirect costs must be calculated using the correct indirect cost base and the negotiated indirect cost rate.
- If a field is required (indicated with either an asterisk or a differently-colored background) and no funds are being requested, enter a zero “0.”
- You are encouraged to include the rate agreement used in preparing a budget as a part of the budget justification.
- Do not prepare a budget justification using the expired DOE form F4260.1.

If you are proposing indirect costs and do not already have an Indirect Cost Rate Agreement with your Cognizant Federal Agency or documentation of rates accepted for estimating purposes by DOE or another Federal agency, it is recommended that you begin preparing an Indirect Cost Rate Proposal to be submitted, upon request, to the DOE contract specialist/grants management specialist who will evaluate your application if you are selected for award.

For your convenience in preparing an Indirect Cost Rate proposal, a link to applicant resources, including indirect rate model templates, has been provided below:
<https://science.osti.gov/sbir/applicant-resources/grant-application/>.

Budget Fields

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| 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. Within the justification, explain the fringe benefit rate used if it is not the standard faculty rate. |
| 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. Within the justification, provide the |

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| | number of positions being filled in each category of other personnel. |
| Section C Equipment | For the purpose of this budget, equipment is designated as an item of property that has an acquisition cost of \$10,000 or more and an expected service life of more than one year, unless a different threshold is specified in a negotiated Facilities and Administrative Cost Rate. (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. Within the budget justification, detail the number of personnel planning to travel and the estimated per-traveler cost for each trip. |
| Section E Participant/Trainee Support Costs | If applicable, submit training support costs. Educational projects that intend to support trainees (precollege, college, graduate and postgraduate) 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. |

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| | <p>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).</p> <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, 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). • Automatic Data Processing (ADP)/Computer Services: Enter total funds requested for ADP/Computer Services. Cloud computing costs must be included under this item. 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, including the rates and bases being used, for each field. Only four general categories of indirect costs are allowed/requested on this form, so please consolidate if needed. |

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| | Include the cognizant Federal agency and contact information if using a negotiated rate agreement. Within the budget justification, explain the use of multiple rates, if multiple rates are used. |
| Section I Total Direct and Indirect Costs | This is the total of Sections G and H. |

GUIDANCE FOR APPLICATION BUDGETS AND COSTS

All costs requested in a budget must adhere to standard requirements for all Federal awards:

- Costs must be reasonable, using a prudent-person standard. (2 CFR 200.404),
- Costs must be allocable, related to the particular Federal award. (2 CFR 200.405),
- Costs must be allowable under the relevant Federal cost principles. (See 2 CFR 200.420 and following),
- Costs must be consistently treated, whether they are paid for with Federal funds or institutional funds. (2 CFR 200.403(c))

Allowable costs may include, but are not limited to, the following, subject to the applicable cost principles:

- “Buying out” faculty time dedicated to teaching or administrative responsibilities,
- Support for administrative personnel dedicated to the proposed activity,
- Support for professional development, training, mentoring of students and junior researchers,
- Travel to meet with collaborators at other institutions and relevant DOE/NNSA national laboratories, including costs for internships at the national laboratories; or to attend one or more science team, user facility, scientific conference, workshop, or professional society meetings relevant to the proposed research; or for the conduct of off-site research,
- Fringe benefits, which must be paid in accordance with an institution’s negotiated rates agreement, institutional policies, and the individual’s appointment,
- Temporary dependent-care costs incurred during travel,
- Membership costs in relevant professional societies, including both scientific societies and those dedicated to research administration,
- Instrumentation required to conduct proposed research,
- Equipment (items with a useful life of more than 12 months and a per-item acquisition cost of more than \$10,000) required to conduct proposed research,
- Purchase of equipment, modification of equipment, or provision of services necessary to enable work to be carried out by project personnel with a disability,
- Stipends and benefits for students and post-doctoral researchers, recognizing their dual nature as both trainees and employees,
- Participation in standards development relevant to the proposed research, including travel and membership costs,
- Salary support to cover time to participate in outreach for recruitment, internships, and training events, science team meetings, partnership development, or information gathering, and

- Other direct costs, e.g., materials and supplies such as office supplies, desktop or laptop computer, and/or software licenses that are directly necessary to enable the proposed activities.

14. How to Register in PAMS

After you submit your application through Grants.gov, the application will automatically transfer into PAMS for processing by the DOE SC. 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 LOI.

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.

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 SC 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.

For help with PAMS, click the “PAMS Help” 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 NOFO should reference the NOFO number printed on the cover page.

15. How to View Applications in PAMS

Each Grants.gov application submitted to the DOE 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 PI (Block 14), Authorized Representative (Block 19), and Point of Contact (Block 5). In PAMS notation, applications are known as proposals, the PI 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 SC 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.

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 SC 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.

16. How to Register in Other Systems Before Submitting an Application

SYSTEMS TO REGISTER IN

Applicants must register with FedConnect at www.FedConnect.net. The full, binding version of assistance agreements will be posted to FedConnect. To create an organization account, your organization’s SAM MPIN is required. For more information about the SAM MPIN or other registration requirements, review the FedConnect Ready, Set, Go! Guide at https://www.fedconnect.net/FedConnect/Marketing/Documents/FedConnect_Ready_Set_Go.pdf.

Recipients must register with the Federal Funding Accountability and Transparency Act Subaward Reporting System at <https://www.frs.gov>. This registration must be completed before an award may be made: you are advised to register while preparing your application.

REGISTERING IN GRANTS.GOV

Applicants must register with Grants.gov, following the instructions at <https://www.grants.gov/applicants/applicant-registration> and described above.

WHERE TO SUBMIT AN APPLICATION

You must submit the application through Grants.gov at www.Grants.gov, using either the online webforms or downloaded forms, or a system-to-system service

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.

DOE SC PORTFOLIO ANALYSIS AND MANAGEMENT SYSTEM (PAMS)

Applicants must register in PAMS to submit letters of intent and pre-applications, to view merit reviewer comments, or to take a number of post-award actions.

C. 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 Regulations).

2. Availability of Funds

Funds are not presently available for this award. The Government's obligation under this award is contingent upon the availability of appropriated funds from which payment for award purposes can be made. No legal liability on the part of the Government for any payment may arise until funds are made available to the DOE Contracting Officer for this award and until the recipient receives notice of such availability, to be confirmed in writing by the DOE Contracting Officer.

3. Buy America Requirement for Infrastructure Projects

Required use of Iron, Steel, Manufacture Products, and Construction Materials Produced in the United States

A. DEFINITIONS

For purposes of the Buy America Requirement, the following definitions apply:

Components -See 2 CFR 184.3 Definitions.

Construction Materials -See 2 CFR 184.3 Definitions.

Domestic Content Procurement Preference Requirement – means a requirement that no amount of funds made available through a program for federal financial assistance may be obligated for an infrastructure project unless—

(A) all iron and steel used in the project are produced in the United States;

(B) the manufactured products used in the project are produced in the United States; or

(C) the construction materials used in the project are produced in the United States.

Also referred to as the **Buy America Requirement**.

Infrastructure -See 2 CFR 184.4(c) and (d).

Infrastructure Project – See 2 CFR 184.3 Definitions.

Manufactured Products -See 2 CFR 184.3 Definitions

Predominantly of iron or steel or a combination of both -See 2 CFR 184.3 Definitions.

Produced in the United States -See 2 CFR 184.3 Definitions.

Project – means the construction, alteration, maintenance, or repair of infrastructure in the United States.

Public – The Buy America Requirement does not apply to non-public (private) infrastructure. For purposes of this guidance, infrastructure should be considered “public” if it is: (1) publicly owned (owned, operated, funded and managed, in whole or in part, by any unit or authority of a Federal, State, or Local government-including U.S. Territories and Indian Tribes); or (2) privately owned but utilized primarily for a public purpose. Infrastructure should be considered to be “utilized primarily for a public purpose”, and therefore “public”, if it is privately owned but operated on behalf of the public or is a place of public accommodation.

Section 70917(c) Materials – See 2 CFR 184.3 Definitions.

B. BUY AMERICA REQUIREMENT FOR INFRASTRUCTURE PROJECTS (BUY AMERICA REQUIREMENT)

None of the award funds (includes federal share and Recipient cost share) may be used for a project for infrastructure unless:

- (1) all iron and steel used in the project is produced in the United States—this means all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States;
- (2) all manufactured products used in the project are produced in the United States—this means the manufactured product was manufactured in the United States; and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product, unless another standard for determining the minimum amount of domestic content of the manufactured product has been established under applicable law or regulation. See 2 CFR 184.5 for determining the cost of components for manufactured products; and
- (3) all construction materials¹² are manufactured in the United States—this means that all manufacturing processes for the construction material occurred in the United States. See 2 CFR 184.6 for construction material standards.

The Buy America Requirement only applies to those articles, materials, and supplies that are consumed in, incorporated into, or affixed to the infrastructure in the project. As such, it does not apply to tools, equipment, and supplies, such as temporary scaffolding, brought to the construction site and removed at or before the completion of the infrastructure project. Nor does

¹² Excludes cement and cementitious materials, aggregates such as stone, sand, or gravel, or aggregate binding agents or additives.

the Buy America Requirement apply to equipment and furnishings, such as movable chairs, desks, and portable computer equipment, that are used at or within the finished infrastructure project but are not an integral part of the structure or permanently affixed to the infrastructure project.

The Buy America Requirement only applies to an article, material, or supply classified into one of the following categories* based on its status at the time it is brought to the work site for incorporation into an infrastructure project:

- (i) Iron or steel products;
- (ii) Manufactured products; or
- (iii) Construction materials;

The Buy America Requirement only applies to the iron or steel products, manufactured products, and construction materials used for the construction, alteration, maintenance, or repair of public infrastructure in the United States when those items are consumed in, incorporated into, or permanently affixed to the infrastructure. An article, material, or supply incorporated into an infrastructure project should not be considered to fall into multiple categories, but rather must meet the Buy America Preference Requirement for only the single category in which it is classified.

All iron and steel, manufactured products, and construction materials used in the infrastructure project must be produced in the United States.

* Section 70917(c) Materials are cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives as provided in section 70917(c) of BABA. Section 70917 (c) materials are excluded from Construction materials. Asphalt concrete pavement mixes are typically composed of asphalt cement (a binding agent) and aggregates such as stone, sand, and gravel. Accordingly, asphalt is also excluded from the definition of Construction materials.

Section 70917(c) materials, on their own, are not manufactured products. Further, Section 70917(c) materials should not be considered manufactured products when they are used at or combined proximate to the work site—such as is the case with wet concrete or hot mix asphalt brought to the work site for incorporation. However, certain Section 70917(c) materials (such as stone, sand, and gravel) may be used to produce a manufactured product, such as is precast concrete. Precast concrete is made of components, is processed into a specific shape or form, and is in such state when brought to the work site. Furthermore, wet concrete should not be considered a manufactured product if not dried or set prior to reaching the work site.

Further clarification is provided in 2 CFR 184 on the circumstances under which a determination is made that Section 70917(c) materials should be treated as components of a manufactured product. That determination is based on consideration of: (i) the revised definition of the “manufactured products” at 2 CFR 184.3; (ii) a new definition of “section 70917(c) materials” at 2 CFR 184.3; (iii) new instructions at 2 CFR 184.4(e) on how and when to categorize articles, materials, and supplies; and (iv) new instructions at 2 CFR 184.4(f) on how to apply the Buy America preference by category.

The Buy America Requirement does not statutorily apply to Prime Recipients that are For-Profit Entities. However, the Buy America Requirement is applicable to a For-Profit Entity if: (1) it is a sub-recipient or sub-awardee under an award that contains the Buy America Requirement term and condition, or (2) it is the Prime Recipient that voluntarily chooses to use domestically sourced iron, steel, manufactured products, and construction materials by stating so in its proposed application containing an infrastructure project. If the For-Profit Entity specifically states that it will comply with the Buy America Requirements in its application and it is selected for award, its award will contain a Buy America Requirement for Infrastructure Projects term and condition.

The Prime Recipient is responsible for flowing the Buy America Requirement down to all subawards, all contracts, subcontracts, and purchase orders for work performed under the proposed infrastructure project, including to For-Profit Entities when the For-Profit Entity is a subrecipient or sub-awardee.

Recipients must certify or provide equivalent documentation for proof of compliance that a good faith effort was made to solicit bids for domestic products used in the infrastructure project under this award.

Recipients must also maintain certifications or equivalent documentation for proof of compliance that those articles, materials, and supplies that are consumed in, incorporated into, affixed to, or otherwise used in the infrastructure project, not covered by an approved waiver or an exemption provided in 2 CFR 184.8, are produced in the United States. The certification or proof of compliance must be provided by the suppliers or manufacturers of the iron, steel, manufactured products and construction materials and flow up from all subawardees, contractors and vendors to the recipient. Recipients must keep these certifications with the award/project files and be able to produce them upon request from DOE, auditors or Office of Inspector General.

C. DOE SUBMISSION REQUIREMENTS FOR FULL APPLICATION

Within the first two pages of the workplan or project description, applicants must provide a short statement on whether the project will involve the construction, alteration, maintenance and/or repair of infrastructure in the United States. The ultimate determination about whether a project includes infrastructure remains with DOE, but the applicant's statement will assist project planning and integration of the Buy America Requirement, which may impact the project's proposed budget and/or schedule.

D. WAIVERS

In limited circumstances, DOE may waive the application of the Buy America Requirement in an award where DOE determines that:

- (1) applying the Buy America requirements would be inconsistent with the public interest (Public Interest);
- (2) the types of iron, steel, manufactured products, or construction materials are not

produced in the United States in sufficient and reasonably available quantities or of a satisfactory quality (Non-Availability); or
(3) the inclusion of iron, steel, manufactured products, or construction materials produced in the United States will increase the cost of the overall project by more than 25 percent (Unreasonable Cost).

DOE will only process waiver requests after an award has been made and for which the requests have been submitted in accordance with the term and conditions of the award. Waiver requests must be reviewed by DOE and the Office of Management and Budget's (OMB) Made in America Office and are subject to a public comment period of no less than 15 calendar days.

Waiver Requests may be submitted utilizing [Optional Form 2211](#) (OF2211) or any other format to provide the required information below. DOE or OMB may request additional information for consideration of the waiver. DOE may reject or grant waivers in whole or in part depending on its review, analysis, and/or feedback from OMB or the public. DOE's final determination regarding approval or rejection of the waiver request may not be appealed by a Recipient. The waiver request review and public comment process required for a waiver determination can take up to 65 calendar days.

Requests to waive the Buy America Requirement must include the following:

- Waiver type (Public Interest, Non-Availability, or Unreasonable Cost);= Recipient name and Unique Entity Identifier (UEI);
- Award information (Federal Award Identification Number, Assistance Listing number);
- A brief description of the award- project objectives, location, and the specific infrastructure project involved;
- Total estimated Financial Assistance award value, inclusive of recipient cost share;
- Total estimated infrastructure costs (estimated costs of the Iron, Steel, Manufactured Products and Construction Materials being purchased under the award and utilized in the infrastructure project);
- List and description of iron or steel item(s), manufactured goods, and/or construction material(s) the recipient seeks to waive from the Buy America Requirement, including name, cost, quantity(ies), country(ies) of origin, and relevant Product Service Codes (PSC) and North American Industry Classification System (NAICS) codes for each;
- A detailed justification as to how the non-domestic item(s) is/are essential to the project;
- A certification that the recipient made a good faith effort to solicit bids for domestic products supported by terms included in requests for proposals, contracts, and non-proprietary communications with potential suppliers;
- A justification statement—based on one of the applicable justifications outlined above—as to why the listed items cannot be procured domestically, including the due diligence performed (e.g., market research, industry outreach, cost analysis, cost-benefit analysis) by the recipient to attempt to avoid the need for a waiver. This justification may cite, if applicable, the absence of any Buy America-compliant bids received for domestic products in response to a solicitation;
- A description of the market research conducted that includes who conducted the market research, when it was conducted, sources that were used, and the methods used to conduct

the research; and

- Anticipated impact to the project if no waiver is issued.

The following principles should be incorporated as minimum requirements in waiver request:

- **Time-limited:** Consider a waiver constrained principally by a length of time, or phased-out over time, rather than by the specific project/award to which it applies. Waivers of this type may be appropriate, for example, when an item that is “non-available” is widely used in the project. When requesting such a waiver, the recipient should identify a reasonable, definite time frame (e.g., no more than one to two years) designed so that the waiver is reviewed to ensure the condition for the waiver (“non-availability”) has not changed (e.g., domestic supplies have become more available).
- **Targeted:** Waiver requests should apply only to the item(s), product(s), or material(s) or category(ies) of item(s), product(s), or material(s) as necessary and justified. Waivers should not be overly broad as this will undermine domestic preference policies.
- **Conditional:** The recipient may request a waiver with specific conditions that support the policies of IJJA/BABA and Executive Order 14017.

4. 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.

5. 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.

(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.

6. Corporate Felony Conviction and Federal Tax Liability Representations (March 2014)

In submitting an application in response to this NOFO 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.

7. Digital Persistent Identifier (PID)

Covered individuals¹³ listed on applications must provide aPID in the common Biographical Sketch and Current and Pending (Other) Support forms as part of the application. Included PIDs must meet the common/core standards specified in the [NSPM-33 Implementation Guidance](#) or successor guidance (e.g., an [ORCID iD](#)). The inclusion of an individual's PID will be optional until May 1, 2025, and mandatory thereafter.

8. 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.

Prior to the performance on any work at a DOE-owned or controlled site, the recipient shall contact the site facility manager for information on DOE and site-specific ES&H requirements.

The recipient shall apply this provision to all subrecipients at any tier.

9. 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 a conflict-of-interest agreement and a certificate of confidentiality prior to reviewing an application. Non-Federal personnel conducting administrative activities must sign a non-disclosure agreement.

10. 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 subrecipients at any tier.

11. Foreign Travel

If international travel is proposed for your project, please note that your organization must

¹³ [Covered Individual](#) has the same meaning as in the [Research Security Training Requirement](#) provision.

comply with the International Air Transportation Fair Competitive Practices Act of 1974 (49 U.S.C. § 40118), commonly referred to as the “Fly America Act,” and implementing regulations at 41 CFR 301-10.131 through 301-10.143. The law and regulations require air transport of people or property to, from, between, or within a country other than the United States, the cost of which is supported under this award, to be performed by or under a cost-sharing arrangement with a United States flag carrier, if service is available.

12. 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).

Pre-award Costs: Recipients may charge to an award resulting from this NOFO pre-award costs that were incurred within the 90-day calendar 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 DOE 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.

13. Government Right to Reject or Negotiate

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

14. Intergovernmental Review

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

15. Living Wages

SC is committed to ensuring that students, trainees, and postdoctoral fellows are paid a fair and equitable wage sufficient to allow a reasonable standard of living. Applicant institutions are strongly encouraged to examine their institutional pay scales to ensure that all personnel earn a living wage. The provision of fellowships, traineeships, stipends, honoraria, subsistence allowances, and other similar payments may be allowable expenses on SC financial assistance

awards, per 2 CFR 200.430, § 200.431, and § 200.466. For graduate students, SC considers a reasonable living wage to be an annual income of \$45,000, excluding benefits.

16. Logos and Wordmarks

DOE created a logo that recipients may use. The logos and best practices may be found at <https://www.energy.gov/management/pf-2023-19-department-energy-awardee-usage-branding-and-logo-guide>. Information about the DOE logo, seal, and wordmark may be found at <https://www.energy.gov/management/doe-logo-seal-and-word-mark>. Information about the SC logo may be found at <https://science.osti.gov/About/Resources/Logos>.

17. Modifications

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

18. National Environmental Policy Act (NEPA) Compliance

If the question 4.a. on the “Research and Related Other Project Information” disclosure indicates “potential impact on the environment, negative”, 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 compliance document such as a categorical exclusion (CX), environmental impact statement (EIS,) or an environmental assessment (EA) prepared after selection.

This CX, EIS, or EA process would need to be completed prior to the applicant taking any action on the proposed project that could have adverse environmental effects or that could limit the choice of reasonable alternatives. The three processes would each begin with a request from DOE for an environmental disclosure. If DOE is able to make a CX determination base on that disclosure, that would end the NEPA process.). If DOE determines that an EIS or EA is necessary, it will need to be funded by the applicant and at DOE’s discretion also their participation. Note that in most cases, even when “Potential Impact to the Environment” is checked “Yes” on the other Project Information Form, preparation of EISs and EAs is rarely necessary, but DOE has the expectation that the recipient will disclose the potential, which would serve to initiate dialog with DOE as necessary. The inability to satisfy the NEPA requirements after an award would result in cancellation of the award.

19. Nondisclosure and Confidentiality Agreements Representations (June 2015)

By submitting an application in response to this NOFO, 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

contactors 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.

20. 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.

21. Portable Document Format (PDF) Generation

The project narrative in an application must be one single PDF file that contains the DOE Title Page, project narrative, all required appendices, and other attachments. This single PDF file may not be scanned from a printed document and must be attached in Field 8 on the Grants.gov form. This must be a plain PDF file consisting of text, numbers, and images. The project narrative will be read by SC staff using the full version of Adobe Acrobat: Please ensure that the narrative is readable in Acrobat.

Do not submit files with editable fields, password-protection, encryption, redactions, comments, or any other advanced features in some PDF-compatible software. If a file cannot be opened and searched, an application may be declined.

If combining multiple files into one research narrative, ensure that a PDF portfolio or binder is not created.

If creating PDF files using any software other than Adobe Acrobat, please use a “Print to PDF” or equivalent process to ensure that all content is visible in the project narrative.

Once a project narrative has been assembled, please submit the combined project narrative file through a “Print to PDF” or equivalent process to ensure that all content is visible in one PDF file that can be viewed in Adobe Acrobat.

Review your submission to ensure that blank pages are not present.

22. Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment

As set forth in 2 CFR 200.216, recipients and subrecipients are prohibited from obligating or expending project funds (federal funds and recipient cost share) to procure or obtain; extend or renew a contract to procure or obtain; or enter into a contract (or extend or renew a contract) to procure or obtain equipment, services, or systems that use covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. As described in Section 889 of Public Law 115-232, covered telecommunications equipment is telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).

See Public Law 115-232, Section 889, 2 CFR 200.216, and 2 CFR 200.471 for additional information.

23. Prohibition on Discrimination and Harassment

All people conducting, supporting, or participating in scientific research under this award must be able to do so on the basis of their abilities and without any unnecessary barriers. Recipients of awards resulting from this NOFO are prohibited from engaging in discrimination on any basis prohibited by law, including harassment (sexual or non-sexual) as contained in 10 CFR 1040, 1041, and 1042.

Recipients may contact the DOE’s Office of Civil Rights for technical assistance in meeting their institutional requirements under these regulations, including assistance in addressing complaints of discrimination or harassment (<https://www.energy.gov/diversity/title-ix>). The United States Equal Employment Opportunity Commission also makes a number of resources available at <https://www.eeoc.gov/eeoc/publications/index.cfm> to ensure that employees may perform their work without hindrance. Graduate students and post-doctoral researchers are understood to have a dual role as both trainees and employees, in accordance with 2 CFR 200.400 (f).

24. Prohibition on Entities of Concern

DOE is prohibited by law from using funds made available by the Consolidated Appropriations Act, 2024 ([Public Law 118-42](#)) to award any grant, contract, cooperative agreement, or loan of \$10 million or more in DOE funds to entities of concern, as defined in section 10114 of [Public Law 117-167 \(42 USC 18912\)](#), also known as the CHIPS and Science Act¹⁴. In addition, such entities (including an individual that owns or controls, is owned or controlled by, or is under common ownership or control with an entity of concern) are prohibited from receiving any funds or performing work under any award involving Department activities authorized under Division A or B of Public Law 117-167, subject to certain penalties. See section 10114 of Public Law 117-167 (42 USC 18912) and section 310 of Public Law 118-42 for additional information.

Congress has given DOE authority to require the submission of documentation necessary to implement the requirements of this term by an entity seeking or receiving this award.

25. 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.

26. Prohibition Related to Foreign Government-Sponsored Talent Recruitment Programs

a. Prohibition

Persons participating in a Foreign Government-Sponsored Talent Recruitment Program of a Foreign Country of Risk are prohibited from participating in projects selected for federal funding under this NOFO. Should an award result from this NOFO, the recipient must exercise ongoing due diligence to reasonably ensure that no individuals participating on the DOE-funded project are participating in a Foreign Government-Sponsored Talent Recruitment Program of a Foreign Country of Risk. Consequences for violations of this prohibition will be determined according to applicable law, regulations, and policy. Further, the recipient must notify DOE within five (5)

¹⁴ DOE activities authorized under Public Law 117-167 include Office of Science user facilities, basic energy sciences program, computational materials and chemical sciences centers, foundational nuclear science, carbon materials science initiative, carbon sequestration research and geologic computational science initiative, biological and environmental research, advanced scientific computing research program, quantum network infrastructure research and development and user expansion programs, fusion energy research, high energy physics program, nuclear physics program, accelerator research and development, isotope research and development, high intensity laser research, biological threat preparedness research initiative. [See sections 10101-10113](#). Authorized DOE activities also include technology transfer and laboratory activities such as the Foundation for Energy Security and Innovation ([section 10691](#)), the national clean incubator program ([section 10713](#)), clean energy technology transfer ([sections 10714-10715](#)), Lab partnering service pilot program ([section 10716](#)), Lab-embedded entrepreneurship program ([section 10717](#)), small business voucher program ([section 10718](#)), entrepreneurial leave program ([section 10719](#)), and non-federal employee outside employment authority ([section 10720](#)).

business days upon learning that an individual on the project team is or is believed to be participating in a foreign government talent recruitment program of a foreign country of risk. DOE may modify and add requirements related to this prohibition to the extent required by law.

b. Definitions

1. Foreign Government-Sponsored Talent Recruitment Program. An effort directly or indirectly organized, managed, or funded by a foreign government, or a foreign government instrumentality or entity, to recruit science and technology professionals or students (regardless of citizenship or national origin, or whether having a full-time or part-time position). Some foreign government-sponsored talent recruitment programs operate with the intent to import or otherwise acquire from abroad, sometimes through illicit means, proprietary technology or software, unpublished data and methods, and intellectual property to further the military modernization goals and/or economic goals of a foreign government. Many, but not all, programs aim to incentivize the targeted individual to relocate physically to the foreign state for the above purpose. Some programs allow for or encourage continued employment at United States research facilities or receipt of federal research funds while concurrently working at and/or receiving compensation from a foreign institution, and some direct participants not to disclose their participation to U.S. entities. Compensation could take many forms including cash, research funding, complimentary foreign travel, honorific titles, career advancement opportunities, promised future compensation, or other types of remuneration or consideration, including in-kind compensation.

2. Foreign Country of Risk. DOE has designated the following countries as foreign countries of risk: Iran, North Korea, Russia, and China. This list is subject to change.

27. Proprietary Application Information

Department of Energy (DOE) takes very seriously the confidentiality of all applicants and will treat information submitted in applications, as well as the identity of applicants, as confidential to the fullest extent permissible under Federal law. In order for DOE to protect confidential information, the applicant must also treat the information as confidential and properly mark it as described below. DOE will not be able to protect information that the applicant has released publicly or is in the public domain. For additional information on DOE's Freedom of Information Act (FOIA) regulations, see 10 CFR 1004.

Applicants should not include business sensitive information (e.g., commercial or financial information that is privileged or confidential), trade secrets, proprietary, or otherwise confidential information in their application unless such information is necessary to convey an understanding of the proposed project or to comply with a requirement in the NOFO. Applicants are advised to not include any critically sensitive proprietary detail.

If an application includes trade secrets or information that is commercial or financial, or information that is confidential or privileged, it is furnished to the Government in confidence with the understanding that the information shall be used or disclosed only for evaluation of the application. Such information will be withheld from public disclosure to the extent permitted by

law, including the FOIA. Without assuming any liability for inadvertent disclosure, DOE will seek to limit disclosure of such information to its employees and to outside reviewers when necessary for merit review of the application or as otherwise authorized by law. This restriction does not limit the Government's right to use the information if it is obtained from another source.

Applications and other submissions containing confidential, proprietary, or privileged information must be marked as described below. Failure to comply with these marking requirements may result in the disclosure of the unmarked information under the FOIA or otherwise. The U.S. Government is not liable for the disclosure or use of unmarked information and may use or disclose such information for any purpose.

The cover sheet of the Application and other submission must be marked as follows and identify the specific pages containing trade secrets, confidential, proprietary, or privileged information:

Notice of Restriction on Disclosure and Use of Data:

Pages [list applicable pages] of this document may contain trade secrets, confidential, proprietary, or privileged information that is exempt from public disclosure. Such information shall be used or disclosed only for evaluation purposes or in accordance with a financial assistance or loan agreement between the submitter and the Government. The Government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source. [End of Notice]

The header and footer of every page that contains confidential, proprietary, or privileged information must be marked as follows: "Contains Trade Secrets, Confidential, Proprietary, or Privileged Information Exempt from Public Disclosure." In addition, each line or paragraph containing proprietary, privileged, or trade secret information must be clearly marked with double brackets or highlighting.

IMPORTANT GUIDANCE FOR COMPANY SUBMITTERS:

As per DOE's FOIA regulations and Department of Justice FOIA guidance, if DOE receives a FOIA request the following general steps will be taken:

1. DOE will review the request to determine whether your company's information is subject to the request. Only federal records are subject to FOIA requests. Depending on the circumstances, information submitted by an outside entity may be considered "federal records" for purposes of FOIA.
2. If your company information is determined to be a federal record and responsive to a FOIA request, DOE will review what was submitted in order to determine if DOE can make a determination whether the information is legally exempt.
 - a. If DOE determines your information is fully exempt under an exemption and that it will not be released, DOE may not contact you.
 - b. If DOE is unable to determine whether the information is exempt under an exemption or is planning on releasing some or all of your information, DOE will first contact you in order for you to have an opportunity to respond and provide additional justification as to why it may be exempt. DOE will do all that it can to

work with company submitters to be in compliance with the law and maintain positive relations with company submitters.

- c. It is critical if DOE or DOE's contractors who are processing your FOIA contact you that you respond in a timely manner. DOE is under strict deadlines when processing a FOIA request.

28. Publications

The recipient is expected to publish or otherwise make publicly available the results of the work conducted under any award resulting from this NOFO. Publications and other methods of public communication describing any work based on or developed under an award resulting from this NOFO must contain an acknowledgment of SC support. The format for such acknowledgments is provided at <https://science.osti.gov/funding-opportunities/acknowledgements/>. The author's copy of any peer-reviewed manuscript accepted for publication must be announced to DOE's Office of Scientific and Technical Information (OSTI) and made publicly available in accordance with the instructions contained in the Reporting Requirements Checklist incorporated in all Assistance Agreements. Awards made under this NOFO are subject to DOE's [Public Access Plan](#). Full-text versions of scientific publications must be made publicly accessible at no charge to readers.

29. Registration Requirements

Additional administrative requirements for DOE grants and cooperative agreements are contained in 2 CFR 25 (See: www.eCFR.gov). Prime recipients must keep their data in SAM current at www.SAM.gov. Subrecipients at all tiers must obtain UEI numbers and provide the UEI to the prime recipient before the subaward can be issued.

30. Research Misconduct

Scientific discoveries can only take place when scientific research is conducted in a fair, transparent, and honestly reported manner. Any form of dishonesty—whether plagiarism, falsifying results, or misrepresenting conditions—makes it impossible to advance our understanding of the physical universe.

Recipients are “responsible for maintaining the integrity of research of any kind under an award from DOE including the prevention, detection, and remediation of research misconduct, and the conduct of inquiries, investigations, and adjudication of allegations of research misconduct,” and conducting appropriate administrative processes in response to allegations of research misconduct in accordance with 2 CFR 910.132. Allegations of any misconduct under an award resulting from this NOFO must be reported to the appropriate institutional officials in accordance with institutional policies against misconduct. Additional information on DOE research misconduct policies can be found at: <https://science.osti.gov/grants/Policy-and-Guidance/Research-Misconduct>.

31. Research Security Training Requirement

Covered individuals listed on the application are required to certify that they have taken research security trainings consistent with Section 10634 of the CHIPS and Science Act of 2022. In addition, Applicants must maintain sufficient records (records must be made available to DOE upon request) of their compliance with this requirement for covered individuals at the recipient organization and they must extend this requirement to any and all subrecipients. To fulfill this requirement, applicants may utilize the four training modules developed by the National Science Foundation at <https://new.nsf.gov/research-security/training> or develop and implement their own research security training program aligned with the requirements in Section 10634(B) of the CHIPS and Science Act of 2022. The submission of an application to this NOFO constitutes the applicant's acceptance of this requirement.

Covered Individual means an individual who (a) contributes in a substantive, meaningful way to the development or execution of the scope of work of a project funded by DOE or proposed for funding by DOE, and (b) is designated as a covered individual by DOE.

DOE designates as covered individuals any PI; project director (PD); co-principal investigator (Co-PI); co-project director (Co-PD); project manager; and any individual regardless of title that is functionally performing as a PI, PD, Co-PI, Co-PD, or project manager. Status as a consultant, graduate (master's or PhD) student, or postdoctoral associate does not automatically disqualify a person from being designated as a "covered individual" if they meet the definition in (a) above.

The prime applicant is responsible for assessing the applicability of (a) against each person listed on the application. Further, the prime applicant is responsible for identifying any such individual to DOE for designation as a covered individual, if not already designated by DOE as described above.

Individuals committing no measurable effort or "as-needed" effort are not automatically exempt from being designated as a covered individual. The prime applicant's listing of an individual in the "Senior/Key Person" section of an SF-424(R&R) budget serves as an acknowledgement that DOE designates that person as a covered individual.

DOE may further designate covered individuals during award negotiations or the award period of performance.

32. Rights in Technical Data

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

If software is specified for delivery to DOE, or if other special circumstances exist, e.g., DOE specifying "open-source" treatment of software, then the DOE Contracting Officer, after

negotiation with the recipient, may include in the award special provisions requiring the recipient to obtain written approval of the DOE Contracting Officer prior to asserting copyright in the software, modifying the retained Government license, and/or otherwise altering the copyright provisions.

33. SC Statement of Commitment

The DOE SC is fully and unconditionally committed to fostering safe, diverse, equitable, and inclusive work, research, and funding environments that value mutual respect and personal integrity. SC is committed to advancing belonging, accessibility, justice, equity, diversity, and inclusion across the portfolio of activities we sponsor. SC's effective stewardship and promotion of safe, accessible, diverse, and inclusive workplaces that value and celebrate the diversity of people, ideas, cultures, and educational backgrounds across the country and that foster a sense of belonging in our scientific community is foundational to delivering on our mission. We are committed to promoting people from all backgrounds, including individuals and communities that were historically underrepresented and minoritized in science, technology, engineering, and math (STEM) fields and the activities we sponsor in recognition of our responsibility to serve the public. We also recognize that harnessing a broad range of views, expertise, and experiences drives scientific and technological innovation and enables the SC community to push the frontiers of scientific knowledge for U.S. prosperity and security. Discrimination and harassment undermine SC's ability to achieve its mission by reducing productivity, discouraging, or inhibiting talent retention and career advancement, and weakening the integrity of the SC enterprise overall. SC does not tolerate discrimination or harassment of any kind, including sexual or non-sexual harassment, bullying, intimidation, violence, threats of violence, retaliation, or other disruptive behavior at institutions receiving SC funding or other locations where activities funded by SC are carried out. All applicants and collaborators should familiarize themselves with the SC Statement of Commitment available at

34. Statement of Federal Stewardship

DOE will exercise normal federal stewardship in overseeing the project activities performed under DOE awards. Stewardship activities include but are not limited to conducting site visits; reviewing performance and financial reports; providing assistance and/or temporary intervention in unusual circumstances to correct deficiencies that develop during the project; assuring compliance with terms and conditions; and reviewing technical performance after project completion to ensure that the project objectives have been accomplished.

35. 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:). Prime recipients must register with the new FFATA Subaward Reporting System (FSRS) at <https://www.fsrs.gov> and report the required data on their first tier subrecipients. Prime recipients may be required to report the total compensation for their five most highly compensated executives as part of their registration profile in SAM.gov and for first-tier subrecipients' five most highly compensated executives as in FSRS.gov.

36. Title to Subject Inventions

Ownership of subject inventions is governed pursuant to the authorities listed below:

- **Nonprofit organizations or small business firms:** Under the Bayh-Dole Act (35 U.S.C. § 200 et seq.), nonprofit organizations or small business firms as defined by 35 U.S.C. 201 may elect to retain title to their subject inventions.
- **All other parties:** The federal Non-Nuclear Energy Act of 1974, 42. U.S.C. 5908, provides that the government obtains title to new inventions unless a waiver is granted (see below).
- **Patent Waiver:** DOE has issued Class Patent Waiver W(C) 2022-03 which allows domestic large businesses providing at least 20% cost share to elect to retain title to their subject inventions. Class Patent Waiver W(C) 2022-03 includes a U.S. Competitiveness provision requiring any products embodying or produced through the use of a subject invention first created or reduced to practice in the performance of work under this NOFO to be substantially manufactured in the United States. A domestic large business is any for-profit entity that does not qualify as a “small business” and is incorporated (or otherwise formed) under the laws of a particular state or territory of the United States and is not owned, controlled, or influenced by a foreign government, agency, firm, corporation, or person. 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 NOFO, 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 <https://www.energy.gov/gc/office-assistant-general-counsel-technology-transfer-and-intellectual-property> Nonprofit organizations and small business firms do not need a patent waiver in order to retain title to their subject inventions (see above).
- **Determination of Exceptional Circumstances (DEC):** On June 07, 2021, DOE approved a DETERMINATION OF EXCEPTIONAL CIRCUMSTANCES (DEC) UNDER THE BAYH-DOLE ACT TO FURTHER PROMOTE DOMESTIC MANUFACTURE OF DOE SCIENCE AND ENERGY TECHNOLOGIES. In accordance with this DEC, all awards, including sub-awards, under this NOFO shall include the U.S. Competitiveness Provision in accordance with [Section IX](#) of this NOFO. A copy of the DEC can be found at <https://www.energy.gov/gc/determination-exceptional-circumstances-decs>.
- Pursuant to 37 CFR § 401.4, any nonprofit organization or small business firm as defined by 35 U.S.C. 201 affected by any DEC has the right to appeal it by providing written notice to DOE within 30 working days from the time it receives a copy of the determination.
- DOE may issue and publish on the website above further DEC's prior to the issuance of awards under this NOFO. DOE may require additional submissions or requirements as authorized by any applicable DEC.
- **[IF APPLICABLE] DEC: QUANTUM INFORMATION SCIENCE TECHNOLOGIES DEC:** On August 28, 2020, DOE approved a DETERMINATION OF EXCEPTIONAL CIRCUMSTANCES UNDER THE BAYH-DOLE ACT FOR QUANTUM INFORMATION SCIENCE TECHNOLOGIES, pursuant to 37 CFR 401.3(a)(2), which applies to agreements issued under this NOFO requiring each applicant to agree to a U.S. Competitiveness

Provision. DOE has determined that exceptional circumstances exist that warrant the modification of the standard patent rights clause for small businesses and non-profit recipients under the Bayh-Dole Act, 35 U.S.C. 200 et seq., to the extent necessary to ensure that DOE “obtains sufficient rights in the federally supported inventions to meet the needs of [DOE]” and “to promote the commercialization and public availability of inventions made in the United States by United States industry and labor” and/or further promote other purposes of the Bayh-Dole Act. 35 U.S.C. § 200. In accordance with this DEC, all awards, including sub-awards, under this NOFO shall include the U.S. Competitiveness Provision in accordance with [Section IX](#) of this NOFO. A copy of the DEC can be found at <https://www.energy.gov/gc/determination-exceptional-circumstances-decs>.

[IF APPLICABLE] Class Patent Waiver: DOE has issued Class Patent Waiver No. W(C) 2020-001 of Patent Rights Related to Quantum Information Science and its Technology Applications that applies to this NOFO for any domestic large business that is a recipient, or subrecipient at any tier to this NOFO and is providing at least 20% cost share. Under this Class Patent Waiver, domestic large businesses may elect title to their subject inventions similar to the right provided to the domestic small businesses, educational institutions, and nonprofits by law. In order to avail itself of the class patent waiver, a domestic large business must agree that any products embodying or produced using a subject invention first created or reduced to practice under this program will be substantially manufactured in the United States. Entities not eligible under the Class Patent Waiver are still able to petition DOE for rights under an Advanced or Identified Patent Waiver as described above.

Nonprofit organizations and small business firms do not need a patent waiver in order to retain title to their subject inventions (see above).

37. Trafficking in Persons

Awards resulting from this NOFO are subject to the requirements of 2 CFR 175 (<https://www.ecfr.gov>) which prohibit recipients, their employees, subrecipients, and their employees from severe forms of trafficking in persons; the procurement of a commercial sex act during the period of time that this award or any subaward is in effect; the use of forced labor in the performance of this award or any subaward; or acts that directly support or advance trafficking in persons.

38. U.S. Competitiveness

A primary objective of DOE’s multi-billion-dollar research, development and demonstration investments is to cultivate new research and development ecosystems, manufacturing capabilities, and supply chains for and by U.S. industry and labor. Therefore, in exchange for receiving taxpayer dollars to support an applicant’s project, the applicant must agree to a U.S. Competitiveness provision requiring to any products embodying any subject invention or produced using any subject invention will be manufactured substantially in the United States unless the Recipient can show to the satisfaction of DOE that it is not commercially feasible. Award terms, including the U.S. Competitiveness Provision, are available at

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

Please note that a subject invention is any invention conceived or first actually reduced in performance of work under an award. An invention is any invention or discovery which is or may be patentable. The recipient includes any awardee, recipient, sub-awardee, or sub-recipient.

As noted in the U.S. Competitiveness Provision, if an entity cannot meet the requirements of the U.S. Competitiveness Provision, the entity may request a modification or waiver of the U.S. Competitiveness Provision. For example, the entity may propose modifying the language of the U.S. Competitiveness Provision in order to change the scope of the requirements or to provide more specifics on the application of the requirements for a particular technology. As another example, the entity may request that the U.S. Competitiveness Provision be waived in lieu of a net benefits statement or U.S. manufacturing plan. The statement or plan would contain specific and enforceable commitments that would be beneficial to the U.S. economy and competitiveness. Examples of such commitments could include manufacturing specific products in the U.S., making a specific investment in a new or existing U.S. manufacturing facility, keeping certain activities based in the U.S. or supporting a certain number of jobs in the U.S. related to the technology. DOE may, in its sole discretion, determine that the proposed modification or waiver promotes commercialization and provides sufficient U.S. economic benefits, and grant the request. If granted, DOE will modify the award terms and conditions for the requesting entity accordingly. More information and guidance on the waiver and modification request process can be found in the DOE Financial Assistance Letter on this topic, available here at <https://www.energy.gov/management/pf-2022-09-fal-2022-01-implementation-doe-determination-exceptional-circumstances-under>. Additional information on DOE's Commitment to Domestic Manufacturing for DOE-funded R&D is available at <https://www.energy.gov/gc/us-manufacturing>.

The U.S. Competitiveness Provision is implemented by DOE pursuant to a Determination of Exceptional Circumstances (DEC) under the Bayh-Dole Act and DOE Patent Waivers. See [Section IX](#).

39. Updating Your Portfolio Analysis and Management System (PAMS) Profile

All applicants are encouraged to update their profiles in the PAMS website at <https://pamspublic.science.energy.gov> regularly, at least annually, to ensure SC has your most up to date information. The PAMS profile now requires that individuals provide responses to the demographic related fields. SC strongly encourages personnel at applicant and recipient institutions, including Principal Investigators (PIs), Co-PIs, and other Key Personnel, to provide their demographic information. By providing your demographic information, you are assisting with SC's continued commitment to advancing diversity, equity, and inclusion in its business practices. Alternatively, for information you wish not to disclose, please select, "Do not wish to provide." Your individual demographic information will not be shared with peer reviewers and the information in your PAMS profile is protected by the requirements established in the Federal Privacy Act of 1974. Aggregate, anonymized demographic information may be shared with confidential review committees who are charged to evaluate the quality and efficacy of SC's

business practices. For example, summary statistics of all applicants to or award selections from a particular SC NOFO may be reviewed by a Committee of Visitors.

D. Reference Material

Glossary of Useful Grants and Cooperative Agreement terms

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| Acquisition cost | <i>Acquisition cost</i> means the cost of the asset including the cost to ready the asset for its intended use. Acquisition cost for equipment, for example, means the net invoice price of the equipment, including the cost of any modifications, attachments, accessories, or auxiliary apparatus necessary to make it usable for the purpose for which it is acquired. Acquisition costs for software includes those development costs capitalized in accordance with generally accepted accounting principles (GAAP). Ancillary charges, such as taxes, duty, protective in transit insurance, freight, and installation may be included in or excluded from the acquisition cost in accordance with the non-Federal entity's regular accounting practices. |
| Administrative requirements | <i>Administrative requirements</i> mean the general business management practices that are common to the administration of all grants, such as financial accountability, reporting, equipment management, and retention of records. |
| Advance payment | <i>Advance payment</i> means a payment that a Federal awarding agency or pass-through entity makes by any appropriate payment mechanism, including a predetermined payment schedule, before the non-Federal entity disburses the funds for program purposes. |
| Allocation | <i>Allocation</i> means the process of assigning a cost, or a group of costs, to one or more cost objective(s), in reasonable proportion to the benefit provided or other equitable relationship. The process may entail assigning a cost(s) directly to a final cost objective or through one or more intermediate cost objectives. |
| Allocability | <i>Allocability</i> means the principle which requires that an expense or service charged must directly benefit and be necessary for the performance of the project; when multiple projects are benefited reasonable proportions must be able to be assigned. See 2 CFR 200.405. |
| Allowable cost | <i>Allowable cost</i> means a cost incurred by a recipient that is: (1) reasonable for the performance of the award; (2) allocable; (3) in conformance with any limitations or exclusions set forth in the Federal cost principles applicable to the organization incurring the cost or in the award documents as to the type or amount of cost; (4) consistent with regulations, policies, and procedures of the recipient that are applied uniformly to both federally supported and other activities of the organization; (5) accorded consistent treatment as a direct or indirect cost; (6) determined in accordance with generally accepted accounting principles; and (7) not included as a cost in any other federally supported award (unless specifically authorized by statute). See 2 CFR 200.403. |
| Application | <i>Application</i> means a request for financial support of a project or activity submitted to DOE on specified forms and in accordance with DOE instructions. Also known as a proposal. |
| Appropriation Act | <i>Appropriation act</i> means the statute that provides the authority for Federal agencies to incur obligations to and make payments out of the U.S. treasury for specified purposes. |
| Approved budget | The <i>approved budget</i> for the Federal award summarizes the financial aspects of the project or program as approved during the Federal award process. It may include either the Federal and non-Federal share or only the Federal share, depending upon Federal awarding agency requirements. It must be related to performance for program evaluation purposes whenever appropriate. See 2 |

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| | CFR 200.308(a). |
| Assurance | <i>Assurance</i> means a certification by an applicant, normally included with the application or State plan, indicating that the entity complies with, or that it will comply with, a particular requirement if awarded a Federal grant. |
| Authorized organizational representative | <i>Authorized organizational representative</i> means the individual, named by the applicant organization, who is authorized to act for the applicant and to assume the obligations imposed by the Federal laws, regulations, requirements, and conditions that apply to grant applications or grant awards. |
| Award | <i>Award</i> means the provision of funds by DOE, based on an approved application and budget or progress report, to an organizational entity or an individual to carry out a project or activity. |
| Award documents | <i>Award documents</i> means the entirety of the documents describing the legal relationship between DOE and an awardee or recipient. The award documents include an Assistance Agreement and other documents which may be incorporated by reference or as attachments to the Assistance Agreement. The award documents are the official, legally binding document, signed (or the electronic equivalent of signature) by a Contracting Officer that: <ul style="list-style-type: none"> • notifies the recipient of the award of an award; • contains or references all the terms and conditions of the grant and Federal funding limits and obligations; and, • provides the documentary basis for recording the obligation of Federal funds in the DOE accounting system. |
| Bayh-Dole Act | <i>Bayh-Dole Act</i> means a law which encourages universities and researchers to develop their inventions into marketable products; formal citation is Section 6 of the Patent and Trademark Amendment of 1980, Pub. L 96-517 as amended. |
| Budget | <i>Budget</i> means the financial plan for the project or program that the Federal awarding agency or pass-through entity approves during the Federal award process or in subsequent amendments to the Federal award. It may include the Federal and non-Federal share or only the Federal share, as determined by the Federal awarding agency or pass-through entity. |
| Budget period | <i>Budget period</i> means the intervals of time (usually 12 months each) into which a project period is divided for budgetary and funding purposes. |
| Business officer | <i>Business officer</i> means the financial official of the recipient who has primary fiscal responsibility for the grant. Also known as authorized organizational representative. |
| Capital assets | <i>Capital assets</i> means tangible or intangible assets used in operations having a useful life of more than one year which are capitalized in accordance with GAAP. Capital assets include: <ol style="list-style-type: none"> (a) Land, buildings (facilities), equipment, and intellectual property (including software) whether acquired by purchase, construction, manufacture, lease-purchase, exchange, or through capital leases; and (b) Additions, improvements, modifications, replacements, rearrangements, reinstallations, renovations or alterations to capital assets that materially increase their value or useful life (not ordinary repairs and maintenance). |
| Carryover | <i>Carryover</i> means unobligated Federal funds remaining at the end of any budget period that may be carried forward to another budget period to cover allowable costs of that budget period (whether as an offset or additional authorization). Obligated, but unliquidated, funds are not considered carryover. |
| Change in scope | <i>Change in scope</i> means an activity whereby the objectives or specific aims identified in the approved grant application are significantly changed by the recipient after award. Contracting Officer prior approval is required for a change in scope to be allowable under an award. |
| Closeout | <i>Closeout</i> means the process by which a Federal awarding agency determines |

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| | that all applicable administrative actions and all required work under an award have been completed by the recipient and the Federal awarding agency. |
| Competitive segment | <i>Competitive segment</i> means the initial project period recommended for support or each extension of a project period resulting from a renewal award. |
| Conference (domestic or international) | <i>Conference (domestic or international)</i> means a symposium, seminar, workshop, or any other organized and formal meeting, whether conducted face-to-face or via the Internet, where individuals assemble (or meet virtually) to exchange information and views or explore or clarify a defined subject, problem, or area of knowledge, a published report results from such meeting. |
| Consortium or sub-award agreement | <i>Consortium or sub-award agreement</i> means a formalized agreement whereby a research project is carried out by the recipient and one or more other organizations that are separate legal entities. Under the agreement, the recipient must perform a substantive role in the conduct of the planned research and not merely serve as a conduit of funds to another party or parties. These agreements typically involve a specific level of effort from the consortium organization's PD/PI and a categorical breakdown of costs, such as personnel, supplies, and other allowable expenses, including F&A costs. The relationship between the recipient and the collaborating organizations is considered a sub-award relationship. |
| Consultant | <i>Consultant</i> means an individual who provides professional advice or services for a fee, but not as an employee of the engaging party. To prevent apparent or actual conflicts of interest, recipients and consultants must establish written guidelines indicating the conditions of payment of consulting fees. Consultants also include firms that provide professional advice or services. See 2 CFR 200.459. |
| Continuation application/award | <i>Continuation application/award</i> means a financial assistance request (in the form of an application or progress report) or resulting award for a subsequent budget period within a previously approved project period for which a recipient does not have to compete with other applicants. |
| Contract | <i>Contract</i> means a legal instrument by which a non-Federal entity purchases property or services needed to carry out the project or program under a Federal award. The term as used in this part does not include a legal instrument, even if the non-Federal entity considers it a contract, when the substance of the transaction meets the definition of a Federal award or sub-award (see 2 CFR 200.1 Subaward). |
| Contractor | <i>Contractor</i> means an entity that receives a contract as defined in 2 CFR 200.1 Contract. |
| Contracting (or Grants) Officer | <i>Contracting (or Grants) Officer</i> means a DOE official responsible for the business management aspects of grants and cooperative agreements, including review, negotiation, award, and administration, and for the interpretation of grants administration policies and provisions. COs and GOs are delegated the authority to obligate DOE to the expenditure of funds and permit changes to approved projects on behalf of DOE. |
| Contracting (or Grants Management) specialist | <i>Contracting (or Grants Management) specialist</i> means a DOE staff member who works with a Contracting or Grants Officer and is assigned the day-to-day management of a portfolio of grants and/or cooperative agreements. These activities include, but are not limited to, evaluating grant applications for administrative content and compliance with statutes, regulations, and guidelines; negotiating grants; providing consultation and technical assistance to recipients; and administering grants after award. |
| Cooperative agreement | <i>Cooperative agreement</i> means a type of financial assistance used when there will be substantial Federal scientific or programmatic involvement. Substantial involvement means that, after award, scientific or program staff will assist, guide, coordinate, or participate in project activities. |

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| Cost principles | <i>Cost principles</i> means the government-wide principles, 2 CFR 200 Subpart E (or, in the case of commercial organizations, the Federal Acquisition Regulation [48 CFR 31], or, in the case of hospitals, see Appendix IX to Part 200—Hospital Cost Principles, Appendix E, “Principles for Determining Costs Applicable to Research and Development Under Grants and Contracts with Hospitals”), on allowability and unallowability of costs under federally sponsored agreements. |
| Cost sharing or matching | <i>Cost sharing or matching</i> means the portion of project costs not paid by Federal funds (unless otherwise authorized by Federal statute). See also 2 CFR 200.306 Cost sharing or matching. |
| Deadline | <i>Deadline</i> means the published date and/or time that a grant application is to be submitted to the funding agency. |
| Debarment and suspension | <i>Debarment and suspension</i> mean the actions taken by a debarring official in accordance with OMB guidance at 2 CFR 180, “Non-procurement Debarment and Suspension,” to exclude a person or organization from participating in grants and other non-procurement awards government-wide. If debarred or suspended, the person or organization may not receive financial assistance (under a grant, cooperative agreement, or sub-award, or contract under a grant) for a specified period of time. Debarments and suspensions carried out pursuant to 2 CFR 376 are distinct from post-award suspension action by an awarding agency. See 2 CFR 901 for DOE implementation. |
| Direct costs | <i>Direct costs</i> mean costs that can be identified specifically with a particular sponsored project, an instructional activity, or any other institutional activity, or that can be directly assigned to such activities relatively easily with a high degree of accuracy. See 2 CFR 200.413. |
| Disallowed costs | <i>Disallowed costs</i> mean those charges to a Federal award that the Federal awarding agency or pass-through entity determines to be unallowable, in accordance with the applicable Federal statutes, regulations, or the terms and conditions of the Federal award. |
| Domestic organization | <i>Domestic organization</i> means a public (including a State or other governmental agency) or private non-profit or for-profit organization that is located in the United States or its territories, is subject to U.S. laws, and assumes legal and financial accountability for awarded funds and for the performance of the grant-supported activities. |
| Effort | <i>Effort</i> means the amount of time, usually expressed as a percentage of the total, which a faculty member or other employee spends on a sponsored project. No one is allowed to spend more than 100% total commitment on all academic activities, including grant-sponsored research, university-sponsored research, teaching, administration, advising and other contracted duties. Effort is indicated on the budget in units of person-months. |
| Equipment | <i>Equipment</i> means tangible personal property (including information technology systems) having a useful life of more than one year and a per-unit acquisition cost which equals or exceeds the lesser of the capitalization level established by the non-Federal entity for financial statement purposes, or \$10,000. See also 2 CFR 200.1 Capital assets, Computing devices, General purpose equipment, Information technology systems, Special purpose equipment, and Supplies. |
| Expanded authorities | <i>Expanded authorities</i> means authorization to recipients under certain research grant mechanisms which waives the requirement for prior agency approval for specified actions related to awards. Example: 90-day pre-award spending authority, no cost extensions for up to one additional year, and automatic carryover of unobligated funds from one budget period to the next. The expanded authorities are now contained in Uniform Guidance of 2 CFR 200 as being applicable to all research awards. |

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| Expiration date | <i>Expiration date</i> means generally, the date signifying the end of the current project period, after which the recipient is not authorized to obligate grant funds. |
| Facilities and administrative costs | <i>Facilities and administrative costs</i> mean costs that are incurred by a recipient for common or joint objectives and that, therefore, cannot be identified specifically with a particular project or program. These costs also are known as indirect costs. |
| Federal financial report | <i>Federal financial report</i> means submitted on Standard Form (SF) 425, to indicate the status of awarded funds for the period covered. Frequency of reporting is specified in the Reporting Checklist provided as part of the award documents. |
| Financial assistance | <i>Financial assistance</i> means transfer by DOE of money or property to an eligible entity to support or stimulate a public purpose authorized by statute. |
| Financial status report | <i>Financial status report</i> means see Federal Financial Report. |
| Foreign travel | <i>Foreign travel</i> is meant to include travel outside of North America (Canada, Mexico, and the United States) and U.S. territories and possessions (Guam, American Samoa, Puerto Rico, the U.S. Virgin Islands. A trip is considered foreign travel for all legs of the itinerary if the traveler does not return to his or her post prior to departure for a foreign destination. Costs for foreign travel may be restricted by the language of a Funding Opportunity Announcement. |
| Grant agreement | <p><i>Grant agreement</i> means a legal instrument of financial assistance between a Federal awarding agency or pass-through entity and a non-Federal entity that, consistent with 31 USC 6302, 6304:</p> <p>(a) Is used to enter into a relationship the principal purpose of which is to transfer anything of value from the Federal awarding agency or pass-through entity to the non-Federal entity to carry out a public purpose authorized by a law of the United States (see 31 USC 6101(3)); and not to acquire property or services for the Federal awarding agency or pass-through entity's direct benefit or use;</p> <p>(b) Is distinguished from a cooperative agreement in that it does not provide for substantial involvement between the Federal awarding agency or pass-through entity and the non-Federal entity in carrying out the activity contemplated by the Federal award.</p> <p>(c) Does not include an agreement that provides only:</p> <ol style="list-style-type: none"> (1) Direct United States Government cash assistance to an individual; (2) A subsidy; (3) A loan; (4) A loan guarantee; or (5) Insurance. |
| Grant-supported project or activity | <i>Grant-supported project or activity</i> means those activities specified or described in a grant application or in a subsequent submission that are approved by DOE for funding, regardless of whether Federal funding constitutes all or only a portion of the financial support necessary to carry them out. |
| Grants.gov | <i>Grants.gov</i> (https://www.Grants.gov/) has been designated by the Office of Management and Budget as the single access point for all grant programs offered by 26 Federal grant-making agencies. It provides a single interface for agencies to announce their grant opportunities and for all applicants to find and apply for those opportunities. |
| Indirect costs (facilities & administrative) | <i>Indirect (F&A) costs</i> mean those costs incurred for a common or joint purpose benefitting more than one cost objective, and not readily assignable to the cost objectives specifically benefitted, without effort disproportionate to the results achieved. To facilitate equitable distribution of indirect expenses to the cost objectives served, it may be necessary to establish several pools of indirect |

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| | (F&A) costs. Indirect (F&A) cost pools must be distributed to benefitted cost objectives on bases that will produce an equitable result in consideration of relative benefits derived. |
| Institutional base salary | <i>Institutional base salary</i> means the annual compensation paid by an organization for an employee's appointment, whether that individual's time is spent on research, teaching, patient care, or other activities. Base salary excludes any income that an individual may be permitted to earn outside of duties for the applicant/recipient organization. Base salary may not be increased as a result of replacing organizational salary funds with grant funds. |
| Matching or cost sharing | <i>Matching or cost sharing</i> means the value of third-party in-kind contributions and the portion of the costs of a federally assisted project or program not borne by the Federal government. Matching or cost sharing may be required by statute or program regulation. Costs used to satisfy matching or cost-sharing requirements are subject to the same policies governing allowability as other costs under the approved budget. |
| Merit (or peer) review | <i>Merit (or peer) review</i> means the process that involves the consistent application of standards and procedures that produce fair, equitable, and objective examinations of applications based on an evaluation of scientific or technical merit or other relevant aspects of the application. The review is performed by experts (reviewers) in the field of endeavor for which support is requested. Merit review is intended to provide guidance to the DOE individuals responsible for making award decisions. |
| Monitoring | <i>Monitoring</i> means a process whereby the programmatic and business management performance aspects of a grant are assessed by reviewing information gathered from various required reports, audits, site visits, and other sources. |
| NEPA | <i>NEPA</i> means the National Environmental Policy Act (NEPA), Public Law 91-190, as amended. NEPA requires Federal agencies to assess the environmental effects of proposed major Federal actions prior to making decisions. |
| No-cost extension | <i>No-cost extension</i> means an extension of time to a project period and/or budget period to complete the work of the grant under that period, without additional Federal funds or competition. |
| Non-Federal share | <i>Non-Federal share</i> means when cost sharing or matching is required as a condition of an award, the portion of allowable project/program costs not borne by the Federal government. |
| Notice of Funding Opportunity (NOFO) | <i>Notice of Funding Opportunity (NOFO)</i> means a publicly available document by which a Federal Agency makes known its intentions to award discretionary grants or cooperative agreements, usually as a result of competition for funds. NOFOs may be known as program announcements, requests for applications, notices of funding availability, solicitations, or other names depending on the Agency and type of program. NOFOs can be found at www.Grants.gov . A NOFO may also be known as a solicitation. NOFOs were previously known as Funding Opportunity Announcements (FOAs). |
| Obligations | <i>Obligations</i> , when used in connection with a non-Federal entity's utilization of funds under a Federal award, mean orders placed for property and services, contracts and sub-awards made, and similar transactions during a given period that require payment by the non-Federal entity during the same or a future period. |
| OMB circulars | <i>OMB circulars</i> are government-wide guidance issued to Heads of Federal agencies by the Director of the Office of Management and Budget. |

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| Other significant contributors | <i>Other significant contributors</i> mean individuals who have committed to contribute to the scientific development or execution of the project, but are not committing any specified measurable effort (i.e., person months) to the project. These individuals are typically presented at “effort of zero person months” or “as needed.” Individuals with measurable effort may not be listed as Other Significant Contributors (OSCs). Consultants should be included if they meet this definition. |
| Program participant | <i>Program participants</i> are the recipients of service or training provided at a workshop, conference, seminar, symposium or other short-term instructional or information-sharing activity funded by an external grant or award, or the training beneficiaries of the project or program funded by an external grant or award. A participant is not involved in providing any deliverable to the recipient or a third party or would not be terminated or replaced for failure to perform. |
| Participant support costs | <i>Participant support costs</i> mean direct costs for items such as stipends or subsistence allowances, travel allowances, and registration fees paid to or on behalf of participants or trainees (but not employees) in connection with conferences, or training projects. |
| Person months | <i>Person months</i> is the metric for expressing the effort (amount of time) PD/PI(s), faculty and other senior/key personnel devote to a specific project. The effort is based on the type of appointment of the individual with the organization, e.g., calendar year, academic year, and/or summer term; and the organization’s definition of such. For instance, some institutions define the academic year as a nine (9)-month appointment while others define it as a 10-month appointment. |
| Pre-application or pre-proposal | <i>Pre-application or pre-proposal</i> means a brief outline or narrative of proposed work and sometimes budget, for informal review by a sponsor to determine whether an application should be submitted. Three predominant reasons for requiring submission of a preliminary pre-application are: <ul style="list-style-type: none"> • Reduce the applicant’s unnecessary effort in proposal preparation when the chance of success is very small. This is particularly true of exploratory initiatives where the community senses that a major new direction is being identified, or competitions that will result in a small number of actual awards. • Increase the overall quality of the submission. • Distill the number of applications that will be submitted to the agency and the number of anticipated reviewers needed to review. |
| Pre-award costs | <i>Pre-award costs</i> mean any cost incurred prior to the beginning date of the project period or the initial budget period of a competitive segment (under a multi-year award), in anticipation of the award and at the applicant’s own risk, for otherwise allowable costs. |
| Prior approval | <i>Prior approval</i> means written approval from the designated Contracting Officer. |
| Program Director/ Principal Investigator | <i>Program Director/ Principal Investigator</i> means the individual(s) designated by the applicant organization to have the appropriate level of authority and responsibility to direct the project or program to be supported by the award. The applicant organization may designate multiple individuals as program directors/principal investigators (PD/PIs) who share the authority and responsibility for leading and directing the project, intellectually and logistically. When multiple PD/PIs are named, each is responsible and accountable to the applicant organization, or as appropriate, to a collaborating organization for the proper conduct of the project or program including the submission of all required reports. The presence of more than one PD/PI on an application or award diminishes neither the responsibility nor the accountability of any individual PD/PI. |

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| Program income | <i>Program income</i> means gross income earned by the non-Federal entity that is directly generated by a supported activity or earned as a result of the Federal award during the period of performance except as provided in 2 CFR 200.307 paragraph (f). (See 2 CFR 200.1 Period of performance.) Program income includes but is not limited to income from fees for services performed, the use or rental of real or personal property acquired under Federal awards, the sale of commodities or items fabricated under a Federal award, license fees and royalties on patents and copyrights, and principal and interest on loans made with Federal award funds. Interest earned on advances of Federal funds is not program income. Except as otherwise provided in Federal statutes, regulations, or the terms and conditions of the Federal award, program income does not include rebates, credits, discounts, and interest earned on any of them. See also 2 CFR 200.407 Prior written approval (prior approval). See also 35 USC 200-212 “Disposition of Rights in Educational Awards” for inventions made under Federal awards. |
| Program Manager | <i>Program Manager</i> means the DOE official responsible for the programmatic, scientific, and/or technical aspects of a grant. The same role is filled by Program Directors, Program Officers, or Project Directors at other Federal agencies. |
| Progress report | <i>Progress report</i> means periodic, frequently annual, report submitted by the recipient and used by DOE to assess progress and to determine whether to provide funding for the budget period that covered by the report. |
| Project/performance site | <i>Project/ performance site</i> means location(s) of where the work described in the research plan will be conducted. |
| Project period | <i>Project period</i> means the total time for which Federal support of a project has been programmatically approved as shown in the award documents; however, it does not constitute a commitment by the Federal government to fund the entire period. The total award period comprises the initial competitive segment, any subsequent competitive segments resulting from a renewal award(s), and extensions. |
| Proposal | See application. |
| Re-budgeting | <i>Re-budgeting</i> means reallocation of funds available for spending between approved budget categories to allow best use of funds to accomplish the project goals. |
| Real Property | <i>Real property</i> means land, including land improvements, structures and appurtenances thereto, but excludes moveable machinery and equipment. |
| Recipient | <i>Recipient</i> means the organization or individual awarded a grant or cooperative agreement by DOE that is responsible and accountable for the use of the funds provided and for the performance of the grant-supported project or activity. The recipient is the entire legal entity even if a particular component is designated in award documents. The recipient is legally responsible and accountable to DOE for the performance and financial aspects of the grant-supported project or activity. Also known as awardee or grantee. |
| Renewal application | <i>Renewal application</i> means an application requesting additional funding for a period subsequent to that provided by a current award. Renewal applications compete for funds with all other peer reviewed applications and must be developed as fully as though the applicant is applying for the first time. |
| Research | <i>Research</i> is defined as a systematic study directed toward fuller scientific knowledge or understanding of the subject studied. See 2 CFR 200.1 Research and Development (R&D). |
| Research misconduct | <i>Research misconduct</i> means fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results, but does not include honest error or differences of opinion. See 10 CFR 733. |

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| SAM.gov | <i>SAM.gov</i> is the System for Award Management (SAM) a consolidated service that includes Entity Registration, Assistance Listings, and other services for making, managing, and receiving Federal awards. |
| Scope of work | <i>Scope of work</i> means the aims, objectives, and purposes of a grant; as well as the methodology, approach, analyses or other activities; and the tools, technologies, and timeframes needed to meet the grant’s objectives. This includes the research or training plan included with the original grant application, along with any approved modifications. |
| Senior/Key Personnel | <i>Senior/Key personnel</i> means the PD/PI and other individuals who contribute to the scientific development or execution of a project in a substantive, measurable way, whether or not they receive salaries or compensation under the grant. Typically, these individuals have doctoral or other professional degrees, although individuals at the masters or baccalaureate level may be considered senior/key personnel if their involvement meets this definition. Consultants and those with a postdoctoral role also may be considered senior/key personnel if they meet this definition. “Zero percent” effort or “as needed” is not an acceptable level of involvement for Senior/Key Personnel. |
| Significant re-budgeting | <i>Significant re-budgeting</i> means a threshold that is reached when expenditures in a single direct cost budget category deviate (increase or decrease) from the categorical commitment level established for the budget period by more than 25 percent of the total costs awarded. Significant re-budgeting is one indicator of change in scope. |
| Small business concern | <i>Small business concern</i> means a business that meets the regulatory and size requirements established by the SBA at 13 CFR 121. |
| Solicitation | See Funding Opportunity Announcement. |
| Subaward | <i>Subaward</i> means a legal instrument by which a recipient provides funds (or property in lieu of funds) to an eligible subrecipient (or a lower-tier transaction) to perform a substantive portion of the grant-supported program or project. The term includes such financial assistance when provided by any legal agreement (even if the agreement is called a contract) but does not include any form of assistance which is excluded from the definition of a grant, including the recipient’s procurement of property or services needed to carry out the project or program. The term includes consortium agreements. |
| Subrecipient | <i>Subrecipient</i> means a non-Federal entity that receives a subaward from a pass-through entity to carry out part of a Federal program; but does not include an individual that is a beneficiary of such program. A sub-recipient may also be a recipient of other Federal awards directly from a Federal awarding agency. |
| Supplement | <i>Supplement</i> means a request for an increase in support during a current budget period for expansion of the project’s scope or to meet increased costs unforeseen at the time of the new or renewal application. A supplement may increase support for future years in addition to the current year. Supplements require applications and are subject to administrative and merit review. |
| Terms and conditions of award | <i>Terms and conditions of award</i> means all legal requirements imposed on a grant by DOE, whether based on statute, regulation, policy, or other document referenced in the grant award, or specified by the grant award document itself. The award documents may include both standard and special conditions that are considered necessary to attain the grant’s objectives, facilitate post-award administration of the grant, conserve grant funds, or otherwise protect the Federal government’s interests. |
| UEI | <i>UEI</i> is the Unique Entity Identifier, a twelve-digit alphanumeric sequence established and assigned by the System for Award Management at https://www.SAM.gov to uniquely identify an entity. |

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| Unallowable costs | <i>Unallowable costs</i> mean costs that cannot be charged, directly or indirectly, to Federal awards because the costs are prohibited by law, regulation (including applicable cost principles), or the terms and conditions of award. Costs that are not allowable, allocable, or reasonable are unallowable. |
| Unliquidated obligation | <i>Unliquidated obligations</i> mean, for financial reports prepared on a cash basis, obligations incurred by the non-Federal entity that have not been paid (liquidated). For reports prepared on an accrual expenditure basis, these are obligations incurred by the non-Federal entity for which an expenditure has not been recorded. |
| Unobligated balance | <i>Unobligated balance</i> means the amount of funds under a Federal award that the non-Federal entity has not obligated. The amount is computed by subtracting the cumulative amount of the non-Federal entity's unliquidated obligations and expenditures of funds under the Federal award from the cumulative amount of the funds that the Federal awarding agency or pass-through entity authorized the non-Federal entity to obligate. |
| Validate | In the context of the data management plan requirements, <i>validate</i> means to support, corroborate, verify, or otherwise determine the legitimacy of the research findings. Validation of research findings could be accomplished by reproducing the original experiment or analyses, comparing and contrasting the results against those of a new experiment or analyses, or by some other means. |