

**DEPARTMENT OF ENERGY (DOE)
OFFICE OF SCIENCE (SC)
BIOLOGICAL AND ENVIRONMENTAL RESEARCH (BER)**



**EARTH AND ENVIRONMENTAL SYSTEMS SCIENCE RESEARCH
IN THE SOUTHEAST U.S.**

**FUNDING OPPORTUNITY ANNOUNCEMENT (FOA) NUMBER:
DE-FOA-0003420**

**FOA TYPE: Initial
CFDA NUMBER: 81.049**

FOA Issue Date:	July 25, 2024
Submission Deadline for Pre-Applications:	September 19, 2024 at 5:00 PM ET A Pre-Application is required.
Pre-Application Response Date:	October 10, 2024 at 5:00 PM ET
Submission Deadline for Applications:	November 21, 2024 at 11:59 PM ET

FOA Summary

FOA Name and Number: Earth and Environmental Systems Science Research in the Southeast U.S., DE-FOA-0003420

Deadline for pre-applications: Thursday, September 19, 2024 at 5:00 PM ET, submitted in PAMS

Deadline for applications: Thursday, November 21, 2024 at 11:59 PM ET, submitted in Grants.gov

The DOE SC program in Biological and Environmental Research (BER) hereby announces its interest in receiving applications for collaborative research in the Southeast U.S. Starting in the fall of 2024, the third Atmospheric Radiation Measurement (ARM) Mobile Facility in Bankhead National Forest in Alabama will initiate full operations to provide observations to improve process understanding and model representations of aerosol, cloud, and land-atmosphere interactions, together with key cross-coupling of those areas to quantify land-atmosphere feedbacks and aerosol-cloud interactions. This FOA will consider applications that address science challenges that are within scope of the Atmospheric System Research (ASR), Earth and Environmental System Modeling (EESM), and Environmental System Science (ESS) sub programs. Specifically, this FOA focuses on measurements, experiments, field data, modeling, analysis, and synthesis to provide improved understanding and representation of ecosystems, watersheds, atmospheric processes, and regional modeling in ways that advance the sophistication and capabilities of models that span from individual processes to Earth-system scales. This FOA will encompass four topics 1) vegetation and land-atmosphere interactions; 2) spatial heterogeneity and scaling; 3) convection, clouds, precipitation, and biogenic aerosols; and 4) extreme events and disturbance. Proposed research may integrate more than one topic. The inclusion of underrepresented, minority serving or emerging research institutions as part of research teams is encouraged.

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.
- DOE/NNSA National Laboratories are not eligible to submit applications under this FOA but may be proposed as subrecipients under another organization's application.
- Non-DOE/NNSA FFRDCs are not eligible to submit applications under this FOA but may be proposed as subrecipients under another organization's application.
- Other Federal Agencies are eligible to submit applications under this FOA and may be proposed as subrecipients under another organization's application.

Total funding available: \$12,000,000 in FY 2025 funds

Awards expected to range from \$300,000 to \$1,000,000

Awards expected to be 3 years in duration

Applications will be subject to merit review and the application of program policy factors for selection.

For additional details, the full FOA immediately follows.

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UPDATES AND REMINDERS

RECOMMENDATION

The Department of Energy (DOE) Office of Science (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.

PROMOTING INCLUSIVE AND EQUITABLE RESEARCH (PIER) PLAN

All new and renewal applications must provide a Promoting Inclusive and Equitable Research (PIER) Plan as an appendix to the project narrative. Please read the instructions in [Section IV](#) and the associated review criteria in [Section V](#).

INTERAGENCY FORMATS FOR CURRENT AND PENDING SUPPORT AND BIOGRAPHICAL SKETCHES

Interagency common instructions for preparing current and pending support and biographical sketches have been developed (https://www.nsf.gov/bfa/dias/policy/nstc_disclosure.jsp) and have been adopted by DOE. The Science Experts Network Curriculum Vitae (SciENcv) system at <https://www.ncbi.nlm.nih.gov/sciencv/> has been updated to support the forthcoming common instructions and formats. The fillable PDFs provided by the National Science Foundation are no longer available. SC strongly encourages all applicants to use the online SciENcv system to ensure that their documents are prepared in the appropriate format with the least inconvenience.

INDIVIDUALS WHO SHOULD NOT SERVE AS MERIT REVIEWERS

Follow the updated instructions in [Section VIII](#) and consider the use of the Collaborator Template available at <https://science.osti.gov/grants/Policy-and-Guidance/Agreement-Forms>. Do not include this list as part of the biographical sketch.

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.

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 <https://science.osti.gov/SW-DEI/SC-Statement-of-Commitment>.

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 FOA may be reviewed by a Committee of Visitors.

PORTABLE DOCUMENT FORMAT (PDF) GENERATION

The project narrative in an application must be one single machine-readable 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. 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 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.

Checklist for Avoiding Common Errors:

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) - Promoting Inclusive and Equitable Research (PIER) Plan - Letter(s) of Collaboration or Authorization, if any
Personally Identifiable Information	None present in the application

Item	Issue
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 new and renewal applications.

Section I – FUNDING OPPORTUNITY DESCRIPTION

GENERAL INQUIRIES ABOUT THIS FOA SHOULD BE DIRECTED TO:

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STATUTORY AUTHORITY

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

APPLICABLE REGULATIONS

Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards, codified at 2 CFR 200
U.S. Department of Energy Financial Assistance Rules, codified at 2 CFR 910
U.S. Department of Energy, Office of Science Financial Assistance Program Rule, codified at 10 CFR 605

SUMMARY

The DOE SC program in Biological and Environmental Research (BER) hereby announces its interest in receiving applications for collaborative research in the Southeast U.S. Starting in the fall of 2024, the third Atmospheric Radiation Measurement (ARM) Mobile Facility in Bankhead National Forest in Alabama will initiate full operations to provide observations to improve process understanding and model representations of aerosol, cloud, and land-atmosphere interactions, together with key cross-coupling of those areas to quantify land-atmosphere feedbacks and aerosol-cloud interactions. This FOA will consider applications that address science challenges that are within scope of the Atmospheric System Research (ASR), Earth and Environmental System Modeling (EESM), and Environmental System Science (ESS) sub programs. Specifically, this FOA focuses on measurements, experiments, field data, modeling, analysis, and synthesis to provide improved understanding and representation of ecosystems, watersheds, atmospheric processes, and regional modeling in ways that advance the sophistication and capabilities of models that span from individual processes to Earth-system scales. This FOA will encompass four topics 1) vegetation and land-atmosphere interactions; 2) spatial heterogeneity and scaling; 3) convection, clouds, precipitation, and biogenic aerosols; and 4) extreme events and disturbance. Proposed research may integrate more than one topic. The

inclusion of underrepresented, minority serving or emerging research institutions as part of research teams is encouraged.

SUPPLEMENTARY INFORMATION

Program Objective

Background

In August 2018, the U.S. Department of Energy (DOE) held a workshop for the Atmospheric Radiation Measurement ([ARM](#)) [user facility](#) that brought together representatives of the scientific community to discuss critical climate challenges where ARM observations could impact and improve Earth system models (https://science.osti.gov/-/media/ber/pdf/community-resources/2019/ARM_Mobile_Facility_Workshop_Report.pdf). In this workshop, the Southeast United States was identified as a priority region for further study. The Southeast U.S. is a warm and humid region with abundant locally forced, atmospheric convection across the region and enhanced convection along coasts. The strong atmospheric coupling with the surface supports the need to study the impacts of variations in land surface characteristics on cloud climatology and transition mechanisms between cloud regimes as well as their associated precipitation. Large amounts of secondary organic aerosols and scattered urban populations can also serve to allow for novel observations to support studies of aerosols' radiative impacts and the interaction between naturally produced and urban aerosols. Additionally, the land surface, boundary layer, vegetation, and aerosol properties in the Southeast U.S. are markedly different from those seen at ARM's fixed observatory in Oklahoma, allowing opportunities to explore new atmospheric research questions that are relevant to the Southeast U.S.

Following this workshop, BER approved a five-year deployment of the third ARM Mobile Facility (AMF3) to the Bankhead National Forest in Alabama to provide observations to improve process understanding and model representations of aerosol, cloud, and land-atmosphere interactions, together with key cross-coupling of those areas to quantify land-atmosphere feedbacks and aerosol-cloud interactions. Further information on ARM's Bankhead National Forest (BNF) observatory, including planned timelines and instrumentation, is available at <https://arm.gov/capabilities/observatories/bnf>. The BNF Science Plan, which outlines scientific objectives for the deployment is available at: <https://www.arm.gov/publications/programdocs/doe-sc-arm-23-035.pdf>.

In August 2023, the U.S. Department of Energy (DOE) held a follow-on workshop, the Southeastern Land-Atmosphere Research Opportunities (SELARO) workshop, to identify gaps in scientific understanding of terrestrial processes in the southeastern U.S. and to explore opportunities to coordinate and leverage research efforts across the region with the AMF3 deployment (<https://ess.science.energy.gov/southeast-land-atmosphere-report/>). That workshop noted that the Southeast U.S. supports a wide variety of ecosystems including natural forests, scrub, grasslands, and wetlands, as well as managed forests, farmland, and developed areas, all influenced by a generally warm and humid climate. Strong climate forcing from the Gulf of Mexico, Atlantic Ocean, and topography result in climate diversity that ranges from warm monsoonal conditions in the southern portion of the region to more temperate conditions in the

northern portion of the region. In addition, the Southeast U.S. is subject to extreme events such as hurricanes, heat waves, drought, flooding, and wildfire, which result in large-scale disturbance of vegetative processes, and changes in hydro-biogeochemical cycling and land cover. Furthermore, rapid growth of urban centers and changing land management practices result in increased stress and vulnerability of natural Southeastern ecosystems. This combination of natural and human processes is expected to cause dynamically changing interactions; however, data is currently lacking to appropriately represent these interactions and their feedbacks to the Earth system in predictive models.

The SELARO workshop identified three main research areas: flux and land-atmosphere interactions, ecology/biogeochemistry/disturbance, and hydrology/ecohydrology/terrestrial-aquatic interface. Across these research areas, common themes and challenges included spatial heterogeneity, changes in vegetation growing season and productivity due to climate change, shifts in disturbance regimes, land management and land use changes, and hydroclimatic feedbacks.

Research supported by this FOA must address one or more of the following programmatic areas within BER's Earth and Environmental Systems Sciences Division (EESSD).

- **ASR**

The goal of ASR is to quantify the interactions among aerosols, clouds, precipitation, and radiation to improve understanding of key cloud, aerosol, precipitation, and radiation processes that affect the Earth's radiative balance and hydrological cycle, especially processes that limit the predictive ability of regional and global models. For the most part, ASR investments are based on measurements of radiation, aerosols, clouds, precipitation, thermodynamics, turbulence, and state variables from the ARM user facility. ARM's continuous observational datasets are supplemented with process models, laboratory studies, and shorter-duration ground-based and airborne field campaigns to target specific atmospheric processes in different atmospheric and climatic regimes and across a range of spatial and temporal scales. ASR's four priority research areas are focused on reducing the large uncertainties in Earth system prediction that can be traced to: aerosol processes, warm boundary-layer processes, convective processes, and high-latitude processes. More information on ASR can be found at <https://asr.science.energy.gov/>.

- **EESM**

EESM develops and applies integrated modeling frameworks to rapidly advance integrative science to achieve greater predictability of climate change over a wide range over multiple time and space scales. More specifically, EESM includes development of the fully coupled Energy Exascale Earth System Model (E3SM), global and regional hierarchical models, multisector dynamics models, and data-driven computational analytic tools, to advance a predictive understanding of the Earth system with an emphasis on significant drivers, feedbacks, and uncertainties within the integrated Earth system. With its broad focus, EESM strives to understand how global climate signals project onto regional scales, how those regional signals affect critical human systems, how people will respond to rapidly changing environmental conditions, and how resulting scale-aware feedbacks influence the predictability of climate and environmental systems. EESM has emphasized research on

extreme events, impacts, and resilience; coastal systems; integrated water cycle, floods, droughts, and sea level rise; high latitudes and impacts on lower latitudes; biogeochemistry, carbon cycle, and feedbacks; urban systems, urban morphology and urban-rural gradients; and energy transitions and changing, connected infrastructure. The resulting highly integrated modeling capabilities and suite of integrated modeling tools are a hallmark of EESM, as is developing and deploying a broad suite of advanced technologies in pursuit of its research goals, including machine learning/artificial intelligence (AI/ML), hierarchical and multi-scale modeling, Digital Earth, exascale computing, advanced software architectures, local to regional test beds, and a range of evaluation tools, from benchmarking to uncertainty quantification. Additionally, EESM is fully committed to open science and strengthening its research-to-operations-to-research framing. More information on EESM can be found at <https://climatemodeling.science.energy.gov/>.

- **ESS**

The goal of ESS is to advance an integrated, robust, and scale-aware predictive understanding of terrestrial systems and their interdependent microbial, biogeochemical, ecological, hydrological, and physical processes. To support this goal, ESS uses a systems approach to develop an integrative framework to elucidate the complex processes and controls on the structure, function, feedbacks, and dynamics of terrestrial systems, that span from molecular to global scales and extend from the bedrock through the soil, rhizosphere, and vegetation to the atmosphere. The ESS scope advances foundational process knowledge with an emphasis on understudied ecosystems. Supported research emphasizes ecological and hydro-biogeochemical linkages among system components and characterization of processes across interfaces (e.g., terrestrial-aquatic, coastal, urban) to address key knowledge gaps and uncertainties across a range of spatial and temporal scales. Incorporation of scientific findings into process and system models is an important aspect of the ESS strategy, both to improve predictive understanding as well as to enable the identification of new research questions and directions. ESS research includes lab- and field-based studies as well as model development, and will continue to use the Modeling-Experimental (ModEx) paradigm (<https://ess.science.energy.gov/modex/>) to examine terrestrial and watershed system properties that exhibit large uncertainties in their functions, feedbacks, and dynamics, and that are insufficiently captured in open-source or community models. Such models are used to generate predictions, and these are compared against laboratory as well as field observations to identify critical uncertainties and inform future research directions. More information on ESS can be found at <https://ess.science.energy.gov/>.

These programs seek to coordinate and collaborate closely with other research activities within BER, other DOE research programs, research efforts supported by other federal agencies, and capabilities available at a variety of DOE user facilities. The EESSD Strategic Plan (<https://ess.science.energy.gov/eessd-strategic-plan/>) highlights scientific grand challenge needs for basic research that address key uncertainties in the understanding of Earth system components, as well as complex uncertainties that arise from the interactions and interdependencies of these components in the coupled Earth system.

More information on BER activities can be found at <https://science.osti.gov/ber/>.

Application Information

All submissions (pre-applications and applications) to this FOA are required to clearly delineate knowledge gaps limiting the understanding of fundamental atmospheric, ecological, or watershed processes and describe how these knowledge gaps link to existing needs/gaps in state-of-the-art models that motivate the proposed research. Applicants must propose specific science questions and/or testable hypotheses and approaches to resolve these knowledge gaps and are expected to provide details on how the results of the proposed research will be used to improve the predictability and sophistication of atmospheric, hydrologic, terrestrial ecosystem, regional and/or Earth system models (ESMs).

Science Research Topics

For this FOA, we consider the domain of the Southeast U.S. to include states bounded by the Gulf of Mexico and the Atlantic Ocean to the south and east, respectively, the Mississippi River to the west, and extends through Tennessee and North Carolina. While the foci of the FOA topics are limited to this region, modeling in response to these topics can include larger meteorological patterns and broader interactions of terrestrial, coastal, and atmospheric processes that affect this region. Requests for research support under this FOA **must** address one or more of the following research topics. Principal Investigators (PIs) should clearly indicate to which topic or topics they are responding. Applications responding to multiple topics will not receive special priority over applications responding to a single topic.

Topic 1: Vegetation and Land-Atmosphere Interactions

Basic understanding of the interactions and feedbacks between the atmospheric boundary layer and terrestrial ecosystems, and predicting how these interactions will change under future climate and disturbance scenarios in the Southeast U.S., is a recognized knowledge gap. Exchanges of water, energy, gases, and particles between the land and atmosphere provide important influences on atmospheric and terrestrial vegetation processes but are poorly constrained in state-of-the-art models. Eddy covariance methodologies have provided powerful insights on local-scale land-atmosphere exchanges, however, larger synoptic or meso-scale processes are not readily observable in the footprint of an eddy covariance tower. Additionally, there are knowledge gaps of turbulent flows across vegetation types and within different forest structures, as well as the spatial interactions across landforms (e.g., natural to urban gradients or forested to non-forested gradients). Furthermore, vegetation has important regulatory control on several hydrological and biogeochemical pathways and processes. Unfortunately, these ecophysiological controls on land-atmosphere interactions are poorly understood or represented in ecosystem and regional models, especially under the influence of chronic and acute disturbances.

The goal of this topic is to improve our predictive understanding of land-atmosphere interactions in the Southeast U.S. While the focus is on smaller/local scale (e.g., vegetation and ecohydrological processes), applicants are encouraged to consider their influence on larger scale land-atmosphere interactions. Specifically, we seek applications that focus on the coupling of

land-atmosphere processes and interactions, with a particular emphasis on the role of vegetation processes. Examples of research under this topic could include:

- Improved representation of the role of vegetation in the regulation of water and carbon cycling through the soil-plant-atmosphere continuum (e.g., ecohydrology) and, where possible, their implications on atmospheric processes such as atmospheric boundary-layer turbulence or boundary layer structure.
- Improved understanding of spatial and temporal changes in land-atmosphere fluxes (e.g., water, carbon, etc.) across landscape and disturbance gradients such as natural to urban or forest to agricultural.
- Advanced understanding of the partitioning between evaporation and transpiration.
- Elucidating the production and regulation of biogenic volatile organic compounds (BVOCs) from vegetation as an indicator for ecosystem stress and/or their role in atmospheric aerosol formation.

Integrated experiments, observations, and modeling of vegetation-atmosphere processes and feedbacks across soil-plant-atmosphere continuum that lead to better translation from individual scales to larger spatial and temporal scales are encouraged. Submissions to this topic should have a clear pathway to upscaling results beyond individual plot, site, or focal species.

Topic 2: Spatial Heterogeneity and Scaling

The Southeast U.S. is characteristically heterogeneous due to the complex, overlapping distributions of vegetation, soils, topography, disturbance, and human land use over both long and short temporal and spatial scales. This multi-scale heterogeneity affects carbon, nutrient, water, and energy processes and fluxes, complicating efforts to generalize, model, and predict coupled biogeochemical processes. Uncertainties associated with spatial heterogeneity manifest at scales ranging from tens of m² to hundreds of km². At the larger scale, there are considerable uncertainties regarding how the spatial arrangement of land cover/use types affects processes such as coupled biogeochemistry, hydrology, and atmospheric interactions. However, at the small scale, microtopographic differences at the soil surface and vegetation may be manifested in distinct patterns in biogeochemistry (carbon-water, carbon-nitrogen, etc.), leaf level turbulence, aerosol production, etc. in sites that experience seasonal or periodic fluctuations in temperature as well as variations of local water table elevation. Bridging or crossing these scales is a unique challenge that requires scientific attention, such as the impacts of heterogeneous precipitation events on local to regional flooding and nutrient flow. Furthermore, micro scale heterogeneity, (e.g., subsurface soil heterogeneity or aerosol precursor production) can drive biogeochemical processes that have profound influences at higher organizational scales, but it is not typically refined or represented by a non-dynamic surrogate in modeling applications. Improvements to state-of-the-art models require an understanding of how patch/plot-scale processes aggregate upwards across a diverse landscape mosaic and how changes in landscape heterogeneity are represented and transferable key ecological and atmospheric processes.

The goal of this topic is to improve our predictive understanding of spatial heterogeneity of key coupled ecological, hydrological, and atmospheric processes in the Southeast U.S. Of particular

interest are applications that consider the transferability of process knowledge between appropriate spatial and temporal scales. Examples of research under this topic could include:

- Improved understanding of coupled biogeochemical transformations across land cover gradients, as well as rhizosphere-plant interactions/transformations across scales.
- Transformation of coupled atmospheric, biogeochemical, or hydrological processes due to heterogenous precipitation events.
- Improved model representation of how coupling of patch-scale processes scale across a diverse landscape mosaic and how changes are influenced by landscape heterogeneity.
- New insights on the influence of disturbances (e.g., droughts, floods, wildfires, and extreme storms) on coupled ecological and/or atmospheric processes.
- Improved description of the role surface heterogeneity plays in driving the spatial and temporal patterns of surface-atmosphere turbulence, mass, and energy exchanges and the evolution of thermals within the atmospheric boundary layer.

Submissions to this topic should have a clear pathway to scale results beyond individual plot, site, or focal species.

Topic 3: Convection, Clouds, Precipitation, and Biogenic Aerosols in the Southeast U.S.

Atmospheric processes in the Southeast U.S. are profoundly impacted by several features including abundant atmospheric moisture from the Gulf of Mexico. In addition, the characteristically heterogenous land surface with varied topography and vegetation types strongly influence the spatio-temporal patterns of atmospheric thermodynamic variables including temperature, humidity, and sensible and latent heat fluxes. The abundance of atmospheric moisture and solar heating leads the Southeast U.S. to experience frequent convection, cloud formation, and precipitation. Locally forced convection is a frequent occurrence in this region throughout the year. This locally forced convection has a diurnal cycle and is strongly influenced by the high degree of local thermodynamic variability. Synoptically forced organized convection, including mesoscale convective systems and severe thunderstorms, is prevalent in the spring and fall. The timing and spatial distribution of shallow cloud formation, transition to deeper convection, and onset of precipitation in the Southeast U.S. have been challenging for models to represent, as have the factors leading to organization of both locally- and synoptically-forced convection and development of mesoscale convective systems. Another characteristic of atmospheric processes in the Southeast U.S. is the large number of biogenic aerosols. Some of these aerosols, such as pollen, are sourced from primary emissions and are referred to as primary biological aerosol particles. Secondary organic aerosols (SOA) can form through chemical reactions involving biogenic volatile organic compounds emitted by vegetation. Biogenic aerosol lifecycle, distribution, and climatology are currently not well-represented in models, nor are the impacts of these aerosols on cloud condensation nuclei (CCN) and ice-nucleating particle (INP) populations and cloud properties and processes.

This topic is focused on improving fundamental understanding, predictability, and model representation of climate-relevant convection, cloud, precipitation, and biogenic aerosol processes in the Southeast U.S. Applicants are encouraged to consider how the thermodynamic and land surface environments in the Southeast U.S. interact to affect these atmospheric

processes. Of particular interest are applications focused on improved atmospheric process understanding; development of improved cloud, aerosol, and convection parameterizations; analysis of model performance; and/or other forms of model development. The use of AMF3 observations is strongly encouraged for this topic; additional observational data sources should be considered as appropriate. Research under this topic could focus on:

- The dynamic, thermodynamic, and microphysical factors regulating the life cycle of convective clouds in the Southeast U.S., including onset, organization, timing, and precipitation properties;
- The impacts of land-atmosphere coupling and environmental heterogeneity on cloud formation and transitions between cloud regimes; and/or
- The life cycle, radiative effects, and impacts on cloud properties and processes involving Southeast U.S. biogenic aerosols.

Topic 4. Extreme Events and Disturbance in the Southeast U.S.

Extreme weather and climate events have disproportionate consequences on natural and human systems. In the Southeast U.S., extreme weather events such as tropical cyclones, mesoscale-convective systems, and intense thunderstorms are prevalent. These can induce significant disturbances on terrestrial ecosystems, streamflow changes, changes in soil moisture, soil carbon, vegetation dieback or community shifts, and wildfire. With climate change, the Southeast U.S. is becoming increasingly vulnerable to these extremes, and the characteristics of these extremes are also changing. In addition to extreme events, the region is also influenced by large-scale dynamics such as the different modes of climate variability, and local climatic influences such as moisture/wind transport from the Gulf of Mexico and Atlantic Ocean serve as critical drivers. Regionally distinguishing features also include topographic influences from the Appalachian Mountains, urban-rural gradients, and forested areas.

The goal of this topic is to solicit applications that focus on the use of high-resolution or regionally refined models to enhance understanding and representation of extreme events and their associated impacts in the Southeast U.S. with particular attention to the regional details that can influence the evolution, intensity, and duration of extreme events. Model development, process research, and analysis that improve representation and understanding of extreme events, their impacts and feedbacks is solicited. The increased spatial resolution in ESMs along with the prevalence of regionally refined models enables better representation of these extreme events and their consequences. For example, with higher model resolutions, atmosphere models can produce stronger vertical motions by better resolving the temperature and moisture gradients associated with fronts and tropical cyclones and representing the orographic uplift associated with mountains.

Examples of research under this topic could include:

- Enhanced understanding of the representation of the characteristics of extreme events (including cascading and compounding extremes) in the Southeast U.S. in current ESMs, their associated processes and drivers, their impacts on and interactions with the natural Earth system, and how these might change in a changing climate.

- Multiscale modeling and process level research which will help delineate the relative roles of large-scale, regional, coupled processes and/or microphysical processes that are important to the development and characteristics of extreme events in the Southeast U.S.
- Better representation of the impact of single, cascading, and/or recurring extreme events in the terrestrial system, including on vegetation and/or hydrology. Of interest are unique aspects such as scalable traits to represent vegetation dynamics and/or inundation while examining the hydrologic system. Development of metrics, benchmarks, and other relevant syntheses to evaluate extreme events, and their impacts on the terrestrial system.

All applications must have a clear relevance to the Southeast U.S. and address a research gap relevant to the Southeastern U.S. region. Comparisons to non-Southeastern U.S. sites are permitted, but the application should clearly justify the approach and ensure the primary focus of work is in the Southeast U.S.

Applicants are encouraged to make appropriate linkages and connections between EESSD program areas within and among each of the FOA topics. The use of novel approaches and methods and the leveraging of existing infrastructure, capabilities, models, datasets, and networks is encouraged. DOE has heavily invested in the development and use of various models (e.g., E3SM, FATES, etc.), observational systems (e.g., AmeriFlux Network, ARM, etc.), and data repositories and model benchmarking products (e.g., ILAMB, ESS-DIVE, MSD-LIVE, ARM Data Center, etc.). Applications are encouraged to use E3SM and its component models to address modeling science challenges, where appropriate. The use of other multi-model frameworks, or a hierarchy of models, to complement the use of E3SM is encouraged. Applications that develop metrics or benchmarks should include plans to add them to the appropriate DOE-supported community package. Extreme event metrics should be added to the PCMDI Metrics Package (PMP) and benchmarks related to the impacts of extremes on the terrestrial system should be added to the International Land Model Benchmarking (ILAMB) package. Applicants are strongly encouraged to leverage the DOE investments described above to reduce duplication of efforts within the community. Additionally, the leveraging of other federal investments (e.g., NEON, NASA satellite products, USGS stream gage network, etc.) is encouraged.

Collaboration with the DOE National Laboratories is allowed for this FOA, but funding to the National Laboratories is limited to 10% of the total award budget. Collaboration with the DOE National Laboratories is neither a requirement nor an expectation for this FOA.

The application of a coupled model-experiment approach (sometimes called ModEx; <https://ess.science.energy.gov/modex/>) is encouraged where appropriate.

The potential impact, probability of success, and the risk-reward balance will be considered when making funding decisions.

DOE/SC/BER anticipates holding one or more merit review panel of experts to evaluate applications obtained through this FOA.

Annual Meetings: To ensure that the program meets the broadest needs of the research community and the specific needs of the DOE EESSD, a representative (preferably the lead PI) from successful applications is required to attend at least one of the annual principal investigator/science team meetings. The Joint ARM User Facility and ASR Principal Investigators Meeting is a week-long meeting typically held in the spring. EESM holds a one-week meeting in either the summer or fall. ESS meetings are usually two days in the spring. Travel funds should be budgeted to allow for at least one representative to attend one of these meetings in the Washington DC area for each year of the project.

Limitation on Number of Applications: An individual may be listed as the PI on no more than one pre-application or application. All senior or key personnel (identified by name in a pre-application or application) may only be named in two separate submissions. E.g., an individual could be named as a Co-Investigator on two applications but could be named PI on only one application.

Data Management and Data Sharing Policy: Research data obtained through public funding are a public trust. As such, these data must be publicly accessible. As noted in Section IV of this FOA, a Data Management Plan (DMP) is a required element for all applications. The DMP should include a clear description of the applicant's strategy for collecting, validating, curating, preserving, quality assuring, metadata tagging, standardizing, and sharing of data acquired during the course of the funded research effort. This includes data from extensive, long-term observations and experiments and from long-term Earth system model simulations and other simulations that would be costly to duplicate.

In accordance with DOE/EESSD data management requirements (<https://science.osti.gov/ber/Funding-Opportunities/Digital-Data-Management>), and SC's open-data philosophy, all data used, and all resultant products must be made accessible through or archived in the and appropriate repository. EESSD currently supports several archives, including the Environmental System Science – Data Infrastructure for a Virtual Ecosystems (ESS-DIVE; <https://ess-dive.lbl.gov/>); the ARM Data Center (<https://www.arm.gov/data/>); [the Earth System Grid Federation \(ESGF; https://esgf.llnl.gov/](#)); and the MultiSector Dynamics-Living, Intuitive, Value-adding, Environment (MSD-LIVE; <https://msdlive.org/>). Successful applicants and collaborative teams are required to annually share their data, data products, and metadata from their funded project publicly in one of these BER supported data repositories. If successful applicants store some or all of their data in an established, public, long-term archive other than one of the above listed BER-supported archives (e.g., AmeriFlux Archive, NASA DAAC, NCBI, DOE user facilities), they are also required to, at a minimum, archive metadata describing the data with the appropriate BER supported archive, including links/DOI's to the archived data. Details of what has been provided to the specified data archive, including citations and URLs of data packages, must be provided in the project's annual progress report to DOE. Failure to provide evidence of data submission may jeopardize release of the continuation of financial support for the supported application. These archiving requirements are not intended to interfere with data management activities at the home institution(s) of the project PI(s). Applications that represent multiple PIs and/or institutions must describe the data management strategy across the entire team.

Individual PIs and teams are allowed an initial period of up to one year of exclusive use of the data from the date of acquisition to quality check the data and to publish papers based on the data, as outlined in the additional EESSD requirements regarding digital data management (<https://science.osti.gov/ber/Funding-Opportunities/Digital-Data-Management>). However, some data sources or facilities may have more limited exclusive use policies. The appropriate BER program manager must approve exceptions to this requirement, based upon a written request from the lead PI that fully explains the basis or extenuating circumstances for the request. Successful applicants are strongly encouraged to engage the respective BER supported data archive team to identify appropriate standards and training for submitting the data and making the data openly available as soon as possible. Explicit data management and data sharing plans are required to be included as an appendix to the narrative (Appendix 4), and not as an attachment in Grants.gov. DMPs are limited to 3 pages in length (i.e., they are not included in the narrative page length). Criteria for review of DMPs are provided to the reviewers, as described in [Section V](#).

Field campaign approvals and letters of authorization (where applicable):

ARM sites/Bankhead National Forest: Note that all field campaign activities at ARM-managed sites require submission of an ARM field campaign request (<https://www.arm.gov/research/campaigns>). Additionally, any field campaign activities proposed to be conducted in the Bankhead National Forest will require approval by the United States Forest Service (USFS). Examples of field campaign activities include (but are not limited to) deployment of a PI-owned instrument, collection of samples, or requests for special operation of ARM instruments. ARM will help BER-funded investigators coordinate approvals for work in the Bankhead National Forest with the USFS. More details on these requirements and timelines for approvals are available in Appendix E of the ARM Field Campaign Guidelines, available at <https://arm.gov/publications/programdocs/doe-sc-arm-14-032.pdf>.

Please be aware that mid- or high-impact activities (e.g., soil samples, tree tapping/coring, harvesting or removing any samples from the forest, non-eye-safe laser applications, tree removal, excavation, construction, and/or unmanned aerial system flights) proposed to be conducted in the Bankhead National Forest will require USFS research permits and may take significant lead time. Researchers are encouraged to discuss these types of proposed activities with ARM facility managers as soon as possible, and to consider whether locations outside of the National Forest may be more suitable for their proposed research. Researchers may contact ARM to discuss potential field campaign activities through the “Ask Us” link at the bottom of any ARM web page.

Field campaign submissions to the ARM user facility should be made by the deadline of this FOA. Indications of ARM field campaign submission, when applicable, should be provided as an appendix to the narrative (Appendix 7: Other Information, as described in [Section IV](#)), and not as an attachment in Grants.gov.

Authorization Letter for Field Research: For all applications involving field-based sampling or research at an established site (other than at ARM-managed sites) whose access is not controlled by the lead PI or their institution, a letter of collaboration and/or authorization from the lead

individual responsible for the specified field site should be provided in the full application for evaluation of project feasibility. The letter should verify the field site is available for use by the proposed effort, as well as the availability of any expertise/resources for the proposed effort described in the proposal narrative. Authorization letters, when applicable, should be provided as an appendix to the narrative (Appendix 7: Other Information, as described in [Section IV](#)), and not as an attachment in Grants.gov.

Flux Measurements and Sites: Applications that include the collection of flux measurements for carbon, water, and/or energy must contribute to the AmeriFlux Network (<https://ameriflux.lbl.gov/>) and must specify the nature and timing of data submission to AmeriFlux as part of the DMP. The establishment of new flux measurement locations will be considered carefully against the value of existing sites. Potential applicants are encouraged to review scientific activity and data associated with the existing AmeriFlux locations and to consider opportunities for collaboration as alternatives to the establishment of new sites. For applications that seek to sustain existing AmeriFlux locations, priority will be placed on hypothesis-based research and sites that have a strong record of measurement performance and prompt delivery of data products to the AmeriFlux archive, with demonstrated use by the broader scientific community. There is an established archive for reporting AmeriFlux data (<https://ameriflux.lbl.gov/data/how-to-uploaddownload-data/>), and supported projects will be expected to comply rigorously with reporting guidelines and standards.

OTHER SUPPLEMENTARY INFORMATION

Availability of User Facilities and Other Specialized Resources: DOE has responsibility for User Facilities (<https://science.osti.gov/User-Facilities>) and programs that offer unique and complementary resources in support of research in environmental system science. Applicants are encouraged to consider using or collaborating with these experimental, observational, and computational facilities/capabilities, which have existing and dedicated financial support, to leverage their capabilities, including archived samples and long-term data sets. Potential applicants are encouraged to consider use of DOE resources/user facilities in developing their applications. The applicant must certify via written documentation (e.g., letter of collaboration and/or access) that user program coordinators, site/capability coordinators/managers, and/or advisory panels find the proposed research within their mission and would support the access or use if selected for an award. Some User Facilities have a separate proposal process, but applicants to this FOA should still provide a letter from that facility indicating the proposed interaction would be within scope of their capabilities pending successful selection through their respective process. This documentation should be in the form of a letter of agreement, signed by an individual with authority to commit the expertise/resources of the collaborating institution/project/program, and submitted with the application. Examples of available user facilities and other specialized resources can be found at <https://ess.science.energy.gov/resources>.

For ARM, indication of submission of the ARM field campaign proposal as discussed above, rather than a letter of collaboration, should be included. Download and use of data from the ARM Data Center does not require a letter of collaboration.

Teaming Arrangements

Collaborations with the DOE National Laboratories are allowed for this FOA, but total funding to the National Laboratories is limited to 10% of the total award budget. Collaboration with the DOE National Laboratories is not a requirement or expectation for this FOA. For applications that focus on E3SM model development, applicants are encouraged to include one or more E3SM team member(s) as collaborator(s), either funded or unfunded. Because of the fast-evolving nature of E3SM, a close collaboration will facilitate coordination and increase the likelihood of impactful research outcomes.

BER encourages applications from institutions located in the Southeast U.S. region, as well as institutions and investigators not represented by prior awards (e.g., Minority Serving Institutions, Emerging Research Institutions, and EPSCoR institutions (<https://science.osti.gov/bes/epscor>)). Applicants are encouraged to review the merit review criteria and the program policy factors listed in Section V of this FOA before developing their application narrative.

References

1. The Carnegie Classifications of Institutions of Higher Education can be found at <https://carnegieclassifications.acenet.edu/>. A list of institutions with very high research activity (R1 institutions) is available at https://carnegieclassifications.acenet.edu/institutions/?inst=&basic2021_du%5B%5D=15. A list of institutions with high research activity (R2 institutions) is available at https://carnegieclassifications.acenet.edu/institutions/?inst=&basic2021_du%5B%5D=16. For this FOA, an institution's designation is determined by its presence on this list as of the deadline for any submission.
2. MSIs are understood broadly to include, but not be limited to, Historically Black Colleges and Universities (HBCUs), Hispanic Serving Institutions (HSIs), Tribally Controlled Colleges and Universities (TCCUs), Asian American Native American and Pacific Islander Serving Institutions (AANAPISIs), Alaska Native and Native Hawaiian Serving Institutions (ANNHs), Native American Serving Non-Tribal Institutions (NASNTIs), and Predominantly Black Institutions (PBIs). Institutions listed in the Strengthening Institutions Program (SIP) are not MSIs. The US Department of Education list of HBCUs can be found at: <https://sites.ed.gov/whhbcu/one-hundred-and-five-historically-black-colleges-and-universities/> The US Department of Education maintains records of institutions eligible for recognition as MSIs at <https://www2.ed.gov/about/offices/list/ope/itudes/eligibility.html>. For the purposes of this FOA, institutions marked in the most recent eligibility matrix as either being eligible to receive funding or as receiving funding for any program other than SIP will be considered an MSI. For this FOA, an institution's designation is determined by its presence on these lists as of the deadline for any submission.
3. Emerging Research Institutions (ERIs) are defined in the CHIPS and Science Act of 2022 as institutions of higher education receiving less than \$50 million in Federal research expenditures, using data tabulated by the National Science Foundation's Higher Education Research and Development (HERD) Survey at <https://www.nsf.gov/statistics/srvyherd/>. For the purposes of this FOA, institutions listed in the most recent HERD data as receiving less than \$50 million in Federal research expenditures are ERIs, as of the deadline for any submission.

4. SC has posted a list of institutions with their Carnegie Classifications, designations as MSIs, and ERIs at <https://science.osti.gov/grants/Applicant-and-Awardee-Resources/Institution-Designations>. This list is offered as a convenience and is not exhaustive.

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.

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 \$5,000) 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.

Multi-Institutional Teams

SUBAWARDS¹

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

DOE/National Nuclear Security Administration (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.

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 FOA 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/>

Section II – AWARD INFORMATION

II.A. TYPE OF AWARD INSTRUMENT

DOE anticipates awarding grants/interagency agreements/National Laboratory authorizations under this FOA.

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

II.B. ESTIMATED FUNDING

DOE anticipates that, subject to the availability of future year appropriations, a total of \$12 million in fiscal year 2025 funds will be used to support awards under this FOA.

DOE is under no obligation to pay for any costs associated with preparation or submission of applications. DOE reserves the right to fund, in whole or in part, any, all, or none of the applications submitted in response to this FOA.

II.C. MAXIMUM AND MINIMUM AWARD SIZE

(See [B. Estimated Funding](#) above.)

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

Note that the ceiling and floor specified below apply to each institution's proposed budget inclusive of any proposed subawards.

The ceiling and floor specified below are for total costs, both direct and indirect costs.

Ceiling

\$1,000,000 total for 3-year awards

The award ceiling applies to the total budget, regardless of whether the application is from a single institution or from a multi-institutional team. Applications requesting more than this amount of support may be declined without further review.

Floor

\$300,000 total for 3-year awards.

Applications requesting less than this amount of support may be declined without further review.

II.D. EXPECTED NUMBER OF AWARDS

(See [B. Estimated Funding](#) above.)

The exact number of awards will depend on the number of meritorious applications and the availability of appropriated funds.

II.E. ANTICIPATED AWARD SIZE

(See [B. Estimated Funding](#) above.)

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

II.F. PERIOD OF PERFORMANCE

(See [B. Estimated Funding](#) above.)

DOE anticipates making awards with a project period of 3 years.

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.

II.G. TYPE OF APPLICATION

DOE will accept only new applications under this FOA.

Section III – ELIGIBILITY INFORMATION

III.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.

Federally affiliated⁴ entities must adhere to the eligibility standards below:

III.A.1. DOE/NNSA National Laboratories

DOE/NNSA National Laboratories are not eligible to submit applications under this FOA 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 FOA will apply to the laboratory or any laboratory subcontractor. Additional instructions for securing authorization from the cognizant Contracting Officer are found in [Section VIII](#) of this FOA.

III.A.2. Non-DOE/NNSA FFRDCs

Non-DOE/NNSA FFRDCs are not eligible to submit applications under this FOA 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 VIII](#) of this FOA.

III.A.3. Other Federal Agencies

Other Federal Agencies are eligible to submit applications under this FOA and may be proposed as subrecipients under another organization's application. If recommended for funding as a lead applicant, funding will be provided through an interagency agreement. 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 VIII](#) of this FOA.

Notes for applicants of all types:

- Individual applicants are unlikely to possess the skills, abilities, and resources to successfully accomplish the objectives of this FOA. Individual applicants are encouraged to address this

⁴ Institutions that are not DOE/NNSA National Laboratories, a non-DOE/NNSA FFRDC, or another Federal agency are not Federally affiliated, even if they receive Federal funds or perform work under a Federal award or contract.

concern in their applications and to demonstrate how they will accomplish the objectives of this FOA.

This FOA 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.

Applications that are submitted by applicants that have not submitted a required pre-application may be declined without further review.

Applicants may propose non-domestic entities as subrecipients in their applications. Applicants are advised that successful applications that propose non-domestic entities as subrecipients include a detailed demonstration of how the proposed non-domestic subrecipients possess skills, resources, and abilities that do not exist among potential domestic subrecipients.

III.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.

III.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.

III.D. LIMITATIONS ON SUBMISSIONS

DOE will consider the latest received submissions to be the institution's intended submissions.

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.

Funds requested by a DOE/NNSA National Laboratory are limited to no more than ten percent of the total budget of the multi-institutional team.

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 ten 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

An individual may be listed as the PI on no more than one pre-application or application. All senior or key personnel (identified by name in a pre-application or application) may only be named in two separate submissions.

Individuals receiving more than 25% of their salary and benefits from a DOE/NNSA National Laboratory may not be named as the PI or senior personnel in an application submitted by an applicant other than a DOE/NNSA National Laboratory, regardless of any arrangement between the employing Laboratory and the applicant institution.

Section IV – APPLICATION AND SUBMISSION INFORMATION

IV.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) number (81.049) and/or the FOA number shown on the cover of this FOA. 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>.

IV.B. LETTER OF INTENT (LOI) AND PRE-APPLICATION

IV.B.1. Letter of Intent (LOI)

Not applicable.

IV.B.2. Pre-application

PRE-APPLICATION DUE DATE

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

ENCOURAGE/DISCOURAGE DATE

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

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

Pre-applications will be reviewed for responsiveness of the proposed work to the research topics identified in this FOA. DOE will send a response by email to each applicant encouraging or discouraging the submission of an application by the date indicated on the cover of the FOA. 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
Principal Investigator Name, Job Title
[Lead] Institution
PI Phone Number, PI Email Address

FOA Number: Include the FOA Number indicated on the cover of this FOA
 DOE /SC Program Office: Biological and Environmental Research, Earth and Environmental
 Systems Sciences Division
 DOE/SC Program Office Technical Contacts: Dr. Renu Joseph, Dr. Shaima Nasiri, and/or Dr.
 Daniel Stover

(for all senior/key personnel and unfunded collaborators, if applicable)

Name, Job Title, Institution

The FOA topic(s), specified in Section I, primarily addressed by the proposed work*

Project Keywords [up to five *descriptive* keywords describing the proposed research]

PI Name	Institution	Anticipated Year 1 Budget	Anticipated Year 3 Budget	Anticipated Year 3 Budget	Anticipated Total Budget
Lead PI					
PI/Collaborator**					
Federal Agency/FFRDCC PI**					
Unfunded Collaborator**					
Total Budget					

* Note that you must identify which topic or topics (as described in Section I of this FOA) the preapplication is primarily targeting.

Note that you must include **all team members (funded and unfunded), including federal agencies and sub awardees, when applicable, with their respective anticipated budgets even if they will be funded separately.

The material listed here defines the minimum acceptable information on a cover page. Additional information may be provided at the applicant’s discretion within the page limit.

This information must be followed by a clear and concise description of the objectives and technical approach of the proposed research and how the proposed research addresses at least one of the FOA topics. The pre-application may not exceed two 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 two-page limit. Pre-applications that exceed the two-page limit may not be reviewed. It is the responsibility of the applicant to include sufficient information in the pre-application to enable evaluation of responsiveness to the terms of this FOA.

The pre-application narrative should address the following four areas: Objectives/Goals, Background, Methods/Approach, and Program/FOA/Topic Relevance.

1. Objectives/Goals – Description of the research objectives and goals along with at least one proposed testable hypothesis(es)/research questions that motivates the

- proposed effort.
2. Background/Justification – A description of the background related to the proposed research topic and justification for the scientific need.
 3. Methods/Approach – A high-level description of the proposed technical and methodological approaches to address the proposed hypothesis/research question.
 4. Program, FOA, and topic relevance – A description of how the proposed research addressed the scientific research needs highlighted by this FOA’s topics, as well as the program strategic needs (e.g., program website, program workshop reports, EESSD strategic plan, etc.).

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 (i.e., your advisees/advisors and ongoing and recent collaborators and coauthors). Detailed instructions for how to craft the required listings are provided in [Section VIII](#) of this FOA. **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 PAMS.

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

PRE-APPLICATION REVIEW

Program Managers may evaluate all or some portion of pre-applications to determine their competitiveness within a scientific topic.

Any review will be based on the following criteria:

1. Responsiveness to the objectives of the FOA as stated in Section I.
2. Scientific and technical merit.
3. Appropriateness of the proposed research approaches.
4. Likelihood of scientific impact.

The decision to encourage or discourage the submission of an application may also be influenced by the following factors.

- Relevance of the proposed activity to SC priorities
- Ensuring an appropriate balance of activities within SC programs
- Performance under current awards
- Ensuring a distribution of supported researchers at various career stages
- Promoting the diversity of supported investigators and institutions.
- Increasing participation of institutions historically underrepresented in the SC research portfolio

Any such review will be conducted by no less than three federal program managers chosen for their topical knowledge and diversity of perspective.

Reviews within a topical field will be a comparative review with priority given to scientifically innovative and forward-looking basic research with the highest likelihood of success as an application. The results of the review will be documented.

Applicants with the highest rated pre-applications will be encouraged to submit applications; others will be discouraged from submitting applications.

Written feedback about pre-applications will be provided upon request after award selections have been announced.

Topics with comparatively few pre-applications may not make use of such pre-application reviews. The ratio of encourage/discourage results may differ between topical subjects.

SC is committed to ensuring that a sufficient number of applicants will be encouraged to submit applications to foster a competitive merit review of the applications. SC's intent in discouraging submission of certain applications is to save the time and effort of applicants in preparing and submitting applications with a low likelihood of success.

The PI will be automatically notified when the pre-application is encouraged or discouraged. The DOE SC Portfolio Analysis and Management System (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 Portfolio Analysis and Management System (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 VIII](#) of this FOA.

IV.C. GRANTS.GOV APPLICATION SUBMISSION AND RECEIPT PROCEDURES

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

IV.D. CONTENT AND APPLICATION FORMS

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 FOA.

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

Letters of collaboration or authorization should be placed in Appendix 7 (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 authorization is encouraged to adhere to the following format:

Dear <Principal Investigator Name>:

If your application entitled, "<Application Name>," is selected for funding under the FOA Name, it is my intent to collaborate in this research by < 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 7.

If the proposed research includes activities at the DIII-D National Fusion Facility, a U.S. DOE Office of Science user facility, then a Record of Discussion from the facility must be included in the submission. The Record of Discussion documents potential resources required by the facility to support the proposed research scope. Information on the Record of Discussion process at DIII-D is available at <https://d3dfusion.org/become-a-user/> under the "Records of Discussion" header. An ROD form is available for download from that site.

IV.D.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 Assurances⁵. Applicants are bound by their representations and certifications in 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: Do not select the checkbox for “Pre-application.”

IDENTIFYING NUMBERS (FIELD 4)

Do not enter anything in Fields 4a and 4b. If submitting an updated version of an application, you may enter the previous Grants.gov Tracking ID in Field 4c, though this is not required.

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.

Applications for supplemental support of an existing award should be marked as “Revision.”

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

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.

⁵ No separate form or submission is required for the Certifications and Assurances.

IV.D.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/or unfunded collaborators 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) A. Zhang, Institution 2 (Unfunded Collaborator)</p> <p>Text of abstract (no more than one page, excluding Project Title and list of investigators)</p>
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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:

Title of Application
Principal Investigator Name, Job Title
[Lead] Institution
Mailing Address
PI Phone Number, PI Email Address

Administrative Point of Contact name, telephone number, email:

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

DOE /SC Program Office: Biological and Environmental Research, Earth and Environmental
Systems Sciences Division

DOE/SC Program Office Technical Contacts: Dr. Renu Joseph, Dr. Shaima Nasiri, and/or Dr.

Daniel Stover
PAMS Pre-application tracking number:

(for all senior/key personnel and unfunded collaborators, if applicable)

Name, Job Title, Institution

The FOA topic, specified in Section I, primarily addressed by the proposed work*

Project Keywords [up to five *descriptive* keywords describing the proposed research]

PI Name	Intuition	Year 1 Budget	Year 3 Budget	Year 3 Budget	Total Budget
Lead PI					
PI/Collaborator**					
Federal Agency/FFRDCC PI**					
Unfunded Collaborator**					
Total Budget					

* Note that you must identify which topic(s) (as described in Section I of this FOA) the application is primarily targeting.

**Note that you must include all team members (funded and unfunded), including federal agencies and sub awardees, with their respective budgets even if they will be funded separately.

The material listed here defines the minimum acceptable information on a title page. Additional information may be provided at the applicant’s discretion within the page limit.

Important Instructions to the Sponsored Research Office of Submitting Institutions: SC requires that you create one single machine-readable 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 15 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 FOA.

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 VIII](#) of this FOA 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, clear relevance to the Southeastern U.S. that address a research gap relevant to the southeastern region, 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 or science questions to be addressed and details of the methods to be used including the integration of experiments with theoretical and computational research efforts.
- **Timetable of Activities and Responsibilities:** Timeline and responsibility for all major activities including milestones and deliverables.

Buy America Requirement for Infrastructure Projects

Awards funded through this FOA 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 [Section VIII](#) of this FOA 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 VIII](#) of this FOA 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. Subject to the applicable cost principles, applications may request costs necessary for implementing the DMP.

- This appendix should not exceed a page limit of 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 VIII](#) of this FOA.

In addition, the DMP must specifically address:

- Additional BER requirements and guidance for digital data management (<https://science.osti.gov/ber/Funding-Opportunities/Digital-Data-Management>).

- How FAIR (Findable, Accessible, Interoperable, and Reusable)⁶ principles will apply to the anticipated data sets, software⁷, and models⁸ 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/>).

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

All new and renewal applications that are not for conference support must provide a Promoting Inclusive and Equitable Research (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 intrinsic element to advancing scientific excellence in the research project within the context of the proposing institution and any associated research group(s). Plans may include, but are not limited to: strategies of your institution (and collaborating institutions, if applicable) 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 opportunities.⁹ Plans may incorporate or build upon existing diversity, equity, accessibility, and inclusion efforts of the project key personnel or applicant institution(s), but 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).

⁶ 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>

⁷ 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>

⁸ 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>

⁹ Please see additional information at <https://science.osti.gov/SW-DEI/DOE-Diversity-Equity-and-Inclusion-Policies/Q-and-As#definitions>.

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.

APPENDIX 7: 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.

REMINDERS REGARDING ALL APPENDICES

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

IV.D.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 VIII](#) of this FOA for crafting a biographical sketch.
- Attach the person’s current and pending support, following the instructions in [Section VIII](#) of this FOA 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.

IV.D.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 FOA.

Additional information is found in [Section VIII](#) of this FOA.

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 VIII](#) of this FOA.

IV.D.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 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 essential for understanding and analyzing the proposed research.

IV.D.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.

IV.D.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.

IV.D.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 VIII](#) of this FOA. Attach this information to Field 12 of the Research and Related Other Project Information Form.

IV.D.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

IV.E. SUBMISSIONS FROM SUCCESSFUL APPLICANTS

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

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

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.

IV.F. SUBMISSION DATES AND TIMES

IV.F.1. Letter of Intent Due Date

Not Applicable

IV.F.2. Pre-application Due Date

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

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 FOA and the stated deadline.

IV.F.3. Application Due Date

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

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

IV.F.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 FOA 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.

You may be able to submit your application in response to the currently available SC Annual Solicitation. Please contact the Program Office/Manager listed in this FOA to discuss this option.

If a clerical error by administrative staff results in an incomplete submission of a letter of intent, pre-application, or application, an authorized institutional official may appeal to correct its error by emailing [the Program Office/Manager or the DOE official listed in this FOA or dedicated email address] within 48 business hours of the deadline. This grant of leniency is at DOE's sole discretion.

Section V - APPLICATION REVIEW INFORMATION

V.A. CRITERIA

V.A.1. Initial Review Criteria

Prior to a comprehensive merit evaluation, DOE will perform an initial review in accordance with 10 CFR 605.10(b) to determine that (1) the applicant is eligible for the award; (2) the information required by the FOA, 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 FOA; 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.

V.A.2. Merit Review Criteria

Applications will be subjected to scientific merit review (peer review) and will be evaluated against the following criteria, 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

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?
- To what degree is the proposed research relevant and specific to the Southeast U.S.?
- Does the application specify at least one scientific hypothesis or question motivating the proposed work? Is the investigation of it or them 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?
- Does the plan include sharing data with an appropriate BER-funded archive or repository?

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 question(s), 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 research posed in the context of representing processes in appropriate conceptual and/or numerical models? Are questions posed in the context of identified (or unrecognized) needs for models and do(es) the investigator(s) propose mechanisms whereby the results of the proposed research would be transitioned to the modeling community?
- For those applications proposing to make use of modeling, or advance existing model codes, are approaches proposed to validate model results, and consideration of using the model results to guide future experimental research?

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?

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?
- Are investments in new or enhanced research sites justified?

QUALITY AND EFFICACY OF THE PROMOTING INCLUSIVE AND EQUITABLE RESEARCH PLAN

- Is the proposed Promoting Inclusive and Equitable Research (PIER) Plan suitable for the size and complexity of the proposed project and an integral component of the proposed project?
- 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?
- 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 and are the associated mentoring resources reasonable and appropriate?

V.B. REVIEW AND SELECTION PROCESS

BER anticipates holding a merit review panel of experts to evaluate applications submitted to this FOA.

V.B.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/>.

V.B.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
- Training the next generation of researchers
- Providing career pathways for the next generation of researchers
- Maximizing the use of DOE user facilities
- Ensuring opportunities to investigators not currently supported by DOE
- Quality of international collaboration
- For applicant institutions that are not institutions of higher education: the commitment to research of a basic and fundamental nature divorced from current commercial activity and business applications
- 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 principal investigators with a commitment to improving diversity, equity, and inclusion in the STEM community
- Enhancing the capabilities of states and territories within the jurisdiction of DOE’s Established Program to Stimulate Competitive Research (EPSCoR) to conduct sustainable and nationally competitive energy-related research

V.B.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.

V.B.4. Review of Risk

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.

V.B.5. 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.

V.C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES

DOE is interested in seeing projects supported under this FOA begin work by April 1, 2025.

Section VI – AWARD ADMINISTRATION INFORMATION

VI.A. AWARD NOTICES

VI.A.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.

VI.A.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/rtrtcoverlay_march17.pdf, and DOE Agency Specific Requirements, available at <https://www.nsf.gov/awards/managing/rtc.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/rtc.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.

VI.B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

Additional policy provisions applicable to this FOA are included in the list below. Awards made under this FOA are subject to the respective Administrative and National Policy Requirements.

The full text of each provision is in [Section VIII](#) of this FOA 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. Environmental, Safety and Health \(ES&H\) Performance of Work at DOE Facilities](#)
- [8. Evaluation and Administration by Non-Federal Personnel](#)
- [9. Federal, State, and Local Requirements](#)
- [10. Funding Restrictions](#)
- [11. Government Right to Reject or Negotiate](#)
- [12. Intergovernmental Review](#)
- [13. Logos and Wordmarks](#)
- [14. Modifications](#)
- [15. National Environmental Policy Act \(NEPA\) Compliance](#)
- [16. Nondisclosure and Confidentiality Agreements Representations \(June 2015\)](#)
- [17. Notice Regarding Eligible/Ineligible Activities](#)
- [18. Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment](#)
- [19. Prohibition on Discrimination and Harassment](#)
- [20. Prohibition on Lobbying Activity](#)
- [21. Prohibition Related to Foreign Government-Sponsored Talent Recruitment Programs](#)
- [22. Proprietary Application Information](#)
- [23. Publications](#)
- [24. Registration Requirements](#)
- [25. Research Misconduct](#)
- [26. Rights in Technical Data](#)
- [27. Subaward and Executive Reporting](#)
- [28. Title to Subject Inventions](#)
- [29. U.S. Competitiveness](#)

VI.C. 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.

VI.D. 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.

VI.E. INTERIM CONFLICT OF INTEREST POLICY FOR FINANCIAL ASSISTANCE

VI.E.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.

VI.E.2. SC Implementation

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

Section VII - QUESTIONS/AGENCY CONTACTS

VII.A. QUESTIONS

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

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, 9:00 AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, Email: sc.pams-helpdesk@science.doe.gov. All submission and inquiries about this FOA should reference the FOA number on the cover of this Announcement. Please contact the PAMS help desk for technological issues with the PAMS system.

Questions regarding the specific program areas and technical requirements may be directed to the technical contacts listed for each program within the FOA or below. Please contact the program staff with all questions not directly related to the Grants.gov or PAMS systems.

VII.B. AGENCY CONTACTS

Grants.gov Customer Support	800-518-4726 (toll-free) support@Grants.gov
PAMS Customer Support	855-818-1846 (toll-free) 301-903-9610 sc.pams-helpdesk@science.doe.gov
Program Manager Scientific Contact	Biological and Environmental Research (BER) Dr. Renu Joseph Renu.Jospeh@science.doe.gov Dr. Shaima L. Nasiri Shaima.Nasiri@science.doe.gov Dr. Daniel B. Stover Daniel.Stover@science.doe.gov

Section VIII – SUPPLEMENTARY MATERIAL

VIII.A. 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 FOA, every application, or every institution.

VIII.A.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.

VIII.A.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.

VIII.A.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 FOA 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.

VIII.A.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); and
- 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 FOA, submit collaborative applications with each institution submitting its own application with an identical project narrative, resulting in multiple awards to the collaborating institutions.

VIII.A.5. How to Submit Letters of Intent

Do not submit an LOI unless an FOA 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. (Hint: You may have to sort, filter, or search through the list if it has multiple pages.) Click the “Actions” link in the Options column next to the appropriate PI to obtain a dropdown menu. From the dropdown, choose “Select PI.”
- If the PI for whom you are submitting does not appear on the list, it means he or she has not yet registered in PAMS. For your convenience, you may have PAMS send an email invitation to the PI to register in PAMS. To do so, click the “Invite PI” link at the top left of the “Select PI” screen. You can enter an optional personal message to the PI in the “Comments” box, and it will be included in the email sent by PAMS to the PI. You must wait until the PI registers before you can submit the LOI. Save the LOI for later work by clicking the “Save” button at the bottom of the screen. It will be stored in “My Letters of Intent” for later editing.
- Enter a title for your LOI.
- Select the 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 FOA 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.

VIII.A.6. How to Submit a Pre-Application

Do not submit a pre-application unless an FOA 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 FOA 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.

VIII.A.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.

Complete organization registration instructions can be found on Grants.gov here: <https://www.grants.gov/applicants/applicant-registration/>

- 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)¹⁰. 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

¹⁰ 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.

webforms within an application. For each FOA, 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/>

- 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.

VIII.A.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 FOA. 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 FOA 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 FOA to request that it be withdrawn.

After an application is withdrawn, it may be resubmitted, if this FOA is still open for the submission of applications. Such resubmissions will only count as one submission if this FOA 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 FOA 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 FOA to permit the transfer of the award to a new institution, the new institution must apply under the then-available SC “annual” or “open” FOA.

VIII.A.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.

VIII.A.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 FOA 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

VIII.A.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.

VIII.A.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>

VIII.A.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

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.
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	<p>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.</p>
<p>Section B Other Personnel</p>	<p>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.</p> <p>Include a written narrative in the budget justification that fully justifies the need for requested personnel. Within the justification, provide the number of positions being filled in each category of other personnel.</p>
<p>Section C Equipment</p>	<p>For the purpose of this budget, equipment is designated as an item of property that has an acquisition cost of \$5,000 or more and an expected service life of more than one year, 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.</p>
<p>Section D Travel</p>	<p>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.</p>
<p>Section E Participant/Trainee Support Costs</p>	<p>If applicable, submit training support costs. Educational projects that intend to support trainees (precollege, college, graduate and 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.</p> <p>Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis).</p>
<p>Section F</p>	<ul style="list-style-type: none"> • Materials and Supplies: Enter total funds requested for

Other Direct Costs	<p>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).</p> <ul style="list-style-type: none"> • Publication Costs: Enter the total publication funds requested. The proposal budget may request funds for the costs of documenting, preparing, publishing or otherwise making available to others the findings and products of the work conducted under the award. In the budget justification, include supporting information. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). • 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). • 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.
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	<ul style="list-style-type: none"> • 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. 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.

VIII.A.14. How to Register in PAMS

After you submit your application through Grants.gov, the application will automatically transfer into the Portfolio Analysis and Management System (PAMS) for processing by the DOE 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 FOA should reference the FOA number printed on the cover page.

VIII.A.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.

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

SYSTEMS TO REGISTER IN

Applicants must complete a series of registrations and enrollments to submit applications in response to this FOA. 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 Unique Entity Identifier (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). In limited circumstances, a Social Security Number (SSN) assigned by the Social Security Administration (SSA) may be used as a TIN. 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.

Applicants must register with FedConnect at www.FedConnect.net. The full, binding version of assistance agreements will be posted to FedConnect.

Recipients must register with the Federal Funding Accountability and Transparency Act Subaward Reporting System at <https://www.fhrs.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/web/grants/applicants/registration.html> 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 the Portfolio Analysis and Management System (PAMS) to submit letters of intent and pre-applications, to view merit reviewer comments, or to take a number of post-award actions.

VIII.B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

VIII.B.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).

VIII.B.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.

VIII.B.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 are defined as the articles, materials, or supplies incorporated directly into the end manufactured product(s).

Construction Materials are an article, material, or supply—other than an item primarily of iron or steel; a manufactured product; cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives—that is used in an infrastructure project and is or consists primarily of non-ferrous metals, plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables), glass (including optic glass), lumber, drywall, coatings (paints and stains), optical fiber, clay brick; composite building materials; or engineered wood products.

Domestic Content Procurement Preference Requirement – means a requirement that no amounts 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 includes, at a minimum, the structures, facilities, and equipment located in the United States, for: roads, highways, and bridges; public transportation; dams, ports, harbors, and other maritime facilities; intercity passenger and freight railroads; freight and intermodal

facilities; airports; water systems, including drinking water and wastewater systems; electrical transmission facilities and systems; utilities; broadband infrastructure; and buildings and real property; and generation, transportation, and distribution of energy—including electric vehicle (EV) charging.

The term “infrastructure” should be interpreted broadly, and the definition provided above should be considered as illustrative and not exhaustive.

Manufactured Products are items used for an infrastructure project made up of components that are not primarily of iron or steel; construction materials; cement and cementitious materials’ aggregates such as stone, sand, or gravel; or aggregate binding agents or additives.

Primarily of iron or steel means greater than 50% iron or steel, measured by cost.

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 infrastructure projects. For purposes of this guidance, infrastructure should be considered “public” if it is: (1) publicly owned or (2) privately owned but utilized primarily for a public purpose. Infrastructure should be considered to be “utilized primarily for a public purpose” if it is privately operated on behalf of the public or is a place of public accommodation.

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 public infrastructure project 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; and
- (3) all construction materials¹¹ are manufactured in the United States—this means that all manufacturing processes for the construction material occurred in the United States.

The Buy America Requirement only applies to articles, materials, and supplies that are consumed in, incorporated into, or affixed to an infrastructure project. As such, it does not apply

¹¹ Excludes cement and cementitious materials, aggregates such as stone, sand, or gravel, or aggregate binding agents or additives.

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 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 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 an 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 sub-awards, 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 sub-recipient 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 a waiver or exemption, 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 subrecipients, 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 terms and conditions of the award. Waiver requests must be reviewed by DOE and the Office of Management and Budget's Made in America Office and are subject to a public comment period of no less than 15 calendar days.

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.

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 project, its location, and the specific infrastructure involved;
- Total estimated project cost, with estimated federal share and recipient cost share breakdowns;
- Total estimated infrastructure costs, with estimated federal share and recipient cost share breakdowns;
- 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; 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, 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 IIJA/BABA and Executive Order 14017.

VIII.B.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.

VIII.B.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.

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

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

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

For purposes of these representations the following definitions apply:

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

VIII.B.7. 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.

VIII.B.8. 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.

VIII.B.9. 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.

VIII.B.10. 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 FOA 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.

VIII.B.11. Government Right to Reject or Negotiate

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

VIII.B.12. Intergovernmental Review

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

VIII.B.13. 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>.

VIII.B.14. Modifications

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

VIII.B.15. 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 would 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.

VIII.B.16. Nondisclosure and Confidentiality Agreements Representations (June 2015)

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

- (1) It **does not and will not** require its employees or contractors to sign internal nondisclosure or confidentiality agreements or statements prohibiting or otherwise restricting its employees or contractors from lawfully reporting waste, fraud, or abuse to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information.
- (2) It **does not and will not** use any Federal funds to implement or enforce any nondisclosure and/or confidentiality policy, form, or agreement it uses unless it contains the following provisions:
 - a. *“These provisions are consistent with and do not supersede, conflict with, or otherwise alter the employee obligations, rights, or liabilities created by existing statute or Executive order relating to (1) classified information, (2) communications to Congress, (3) the reporting to an Inspector General of a violation of any law, rule, or regulation, or mismanagement, a gross waste of funds, an abuse of authority, or a substantial and specific danger to public health or safety, or (4) any other whistleblower protection. The definitions, requirements, obligations, rights, sanctions, and liabilities created by controlling Executive orders and statutory provisions are incorporated into this agreement and are controlling.”*
 - b. The limitation above shall not contravene requirements applicable to Standard Form 312, Form 4414, or any other form issued by a Federal department or agency governing the nondisclosure of classified information.
 - c. Notwithstanding provision listed in paragraph (a), a nondisclosure or confidentiality policy form or agreement that is to be executed by a person connected with the conduct of an intelligence or intelligence-related activity, other than an employee or officer of the United States Government, may contain provisions appropriate to the particular activity for which such document is to be used. Such form or agreement shall, at a minimum, require that the person will not disclose any classified information received in the course of such activity unless specifically authorized to do so by the United States Government. Such nondisclosure or confidentiality forms shall also make it clear that they do not bar disclosures to Congress, or to an authorized official of an executive agency or the Department of Justice, that are essential to reporting a substantial violation of law.

VIII.B.17. 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.

VIII.B.18. 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.

VIII.B.19. 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 FOA 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).

VIII.B.20. 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.

VIII.B.21. 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 FOA. Should an award result from this FOA, 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) 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.

VIII.B.22. 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 FOA. 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.

VIII.B.23. Publications

The recipient is expected to publish or otherwise make publicly available the results of the work conducted under any award resulting from this FOA. Publications and other methods of public communication describing any work based on or developed under an award resulting from this FOA 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 FOA are subject to DOE’s [Public Access Plan](#). Full-text versions of scientific publications must be made publicly accessible at no charge to readers.

VIII.B.24. 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.

VIII.B.25. 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 FOA 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>.

VIII.B.26. 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.

VIII.B.27. 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: www.eCFR.gov). Prime recipients must register with the new FSRs database at <https://www.fsr.gov> and report the required data on their first tier subrecipients. Prime recipients must report the executive compensation for their own executives as part of their registration profile in SAM.

VIII.B.28. 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 FOA 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 FOA, in advance of or within 30 days after the effective date of the award. Even if such advance waiver is not requested or the request is denied, the recipient will have a continuing right under the award to request a waiver of the rights of the United States in identified inventions, i.e., individual inventions conceived or first actually reduced to practice in performance of the award. Any patent waiver that may be granted is subject to certain terms and conditions in 10 CFR 784. For more information, see <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 FOA shall include the U.S. Competitiveness Provision in accordance with [Section VIII](#) of this FOA. 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 FOA. 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 FOA 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 FOA shall include the U.S. Competitiveness Provision in accordance with [Section VIII](#) of this FOA. 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 FOA for any domestic large business that is a recipient, or

subrecipient at any tier to this FOA 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).

VIII.B.29. 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 VIII](#).

VIII.C. REFERENCE MATERIAL

Glossary of Useful Grants and Cooperative Agreement terms

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 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 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.

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 \$5,000. 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.

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.
Funding opportunity announcement (FOA)	<i>Funding opportunity announcement (FOA)</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. FOAs 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. FOAs can be found at www.Grants.gov . An FOA may also be known as a solicitation.
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 (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.
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.

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.

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.

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.

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.