FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT

Department of Energy (DOE)
Office of Electricity (OE)

Grid-Enhancing Data Analytics Demonstrations for Operations, Monitoring and Control
Funding Opportunity Announcement (FOA) Number: DE-FOA-0003127
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FOA Issue Date:	December 12, 2023
Submission Deadline for Concept Papers:	January 23, 2024/5:00PM ET*
Submission Deadline for Full Applications:	April 4, 2024/5:00 PM ET*
Expected Date for Concept Paper Notifications:	March 7, 2024
Expected Date for Selection Notifications:	June 21, 2024
Expected Date for Award:	September 30, 2024

*Applicants who do not submit a concept paper cannot submit a Full Application.

Amendments

All Amendments to the FOA are [HIGHLIGHTED] in the body of the FOA.

Amendment No.	Date	Description of Amendment
1	12/19/2023	Page 19, added: "DOE/NNSA FFRDCs are eligible to apply for funding as a subrecipient, but are not eligible to apply as a prime recipient. Page 69, added the term Foreign National Participation (April 2023) Page 70, added the term Export Control Responsibilities (April 2023)
1	3/15/2024	The purpose of this amendment is to provide the budget justification workbook. The Budget Justification workbook can be found at the link below, labeled SF 424 Budget Justification Workbook (3 Budget Periods). Please show Phase 1 research and development costs in "Budget Period 1" and Phase 2 demonstration costs in "Budget Period 2": See: https://netl.doe.gov/business/business-forms/financial-assistance This same information was added to Section xi titled "Budget Justification File" on Page 38

Registration Requirements

There are several one-time actions that must be completed before submitting an application in response to this Funding Opportunity Announcement (FOA) (e.g., register with the System for Award Management (SAM), obtain a Unique Entity Identifier (UEI) number, register with Grants.gov, and register with FedConnect.net to submit questions). It is vital that applicants address these items as soon as possible. Some may take several weeks, and failure to complete them could interfere with an applicant's ability to apply to this FOA.

- **SAM** Applicants must register with SAM at https://www.sam.gov/ prior to submitting an application in response to this FOA (unless the applicant is exempt from those requirements under 2 CFR 25.110). Designating an Electronic Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in SAM registration. Failure to register with SAM will prevent your organization from applying through Grants.gov. The applicant must maintain an active SAM registration with current information at all times during which it has an active Federal award or application under consideration. More information about SAM registration for applicants is found at:
  https://www.fsd.gov/gsafsd_sp?id=gsafsd_kb_articles&sys_id=650d493e1bab7c105465eaccac4bcbcb.

  NOTE: If clicking the SAM links do not work, please copy and paste the link into your browser.

  Due to the high demand of SAM registrations and UEI requests, entity legal business name and address validations are taking longer than expected to process. Entities should start the SAM and UEI registration process as soon as possible. If entities have technical difficulties with the SAM registration or UEI validation 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. Additional entity validation resources can be found here: GSAFSD Tier 0 Knowledge Base - Validating your Entity.

- **UEI** Applicants must obtain an UEI from the SAM to uniquely identify the entity. The UEI is available in the SAM entity registration record.

  NOTE: Subawardees/subrecipients at all tiers must also obtain an UEI from the SAM and provide the UEI to the Prime Recipient before the subaward can be issued.

- **Grants.gov** - Applicants must register with Grants.gov and set up your WorkSpace. You cannot submit an application through Grants.gov unless you are registered. Please read the registration requirements carefully and start the process immediately.

1) The Authorized Organizational Representative (AOR) must register at: https://apply07.grants.gov/apply/OrcRegister
2) An email is sent to the E-Business (E-Biz) POC listed in SAM. The E-Biz POC must approve the AOR registration using their MPIN from their SAM registration.

More information about the registration steps for Grants.gov is provided at:
https://www.grants.gov/web/grants/applicants/registration.html

In addition:

- 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 for the organization in the UEI field while adding a profile. For more detailed instructions about creating a profile on Grants.gov, refer to: https://www.grants.gov/web/grants/applicants/registration/add-profile.html
- *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 EBiz POC. The EBiz POC will then log in to Grants.gov and authorize the appropriate roles, which may include the 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.

  NOTE: 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.**

  For more detailed instructions about creating a profile on Grants.gov, refer to: https://www.grants.gov/web/grants/applicants/registration/authorize-roles.html

  To track your role request, refer to: https://www.grants.gov/web/grants/applicants/registration/track-role-status.html

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

- **FedConnect.net** - Applicants must register with FedConnect to submit questions. FedConnect website: www.fedconnect.net.

  See Section IV for Application and Submission Information (including how to create a WorkSpace).

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I. Funding Opportunity Description

A. Authorizing Statutes

i. The programmatic authorizing statutes are:

- Public Law (PL) 95-91, DOE Organization Act
- Section 925(a) of the Energy Policy Act of 2005 (Public Law 109-58) as amended by the Energy Act of 2020 (Public Law 116-260) (42 U.S.C. 16215)

Awards made under this announcement will fall under the purview of 2 Code of Federal Regulations (CFR) Part 200 as amended by 2 CFR Part 910.

B. Background/Description

i. Background and Purpose

The Department of Energy's (DOE's) National Energy Technology Laboratory (NETL), on behalf of the Office of Electricity (OE), is releasing a funding opportunity announcement (FOA) to solicit applications to enhance grid reliability and resilience with demonstrations of sensors and advanced analytics to develop the grid of the future.

This FOA aims to build on current best practices, standards, and frameworks to advance the state of the art in utility data analytics. Technologies developed through this FOA should leverage information in the potential for rapid deployment and widescale deployment of these new technologies into the power sector.

The power system is changing due to electrification, fossil generation retirements, increases in inverter-based resources (IBR)s and distributed energy resources. Data and analytics using power system sensors are instrumental in maintaining and improving the reliability, affordability, and resilience of the grid in this unprecedented time of change. However, to make use of raw power sector data, contextual information is required to fuel data analytics that can provide the information to decision makers.

The electric industry sector is facing an "explosion" of data coming from a variety of sources. Advanced Metering Infrastructure (AMI) as well as new types of sensors with fast-streaming data sets (such as phasor measurement units) have

been deployed – but data is not useful unless it can be used to create actionable information for decision makers. Traditional methods of data acquisition, labeling, use, and storage in utilities are insufficient to meet the growing need for actionable information from data. For example, data sharing within utilities is often siloed into different uses (planning, protection, operations, and markets), making management of data sets and models expensive and time consuming. Interoperability of data sets from across these different areas of the electricity utility business can provide the contextual information required for new tool development. Resulting tools need to incorporate best practices for human factors, decision science, and cognitive science as much as physics and mathematical methods to be effective.

- New sensors with higher fidelity, are important for understanding and unlocking the potential of inverter-based resources to impact power quality. For example, inverter-based resources can result in new types of system oscillations, and changes to fault-induced delayed voltage recovery (FIDVR) that need to be accounted for in system operations and planning and interconnection standards/procedures.
- Real system data is required to update and validate models that help drive decisions for system planning and operations.
- Tools and applications that leverage AMI and other sources of data can create new business opportunities for utilities, help provide insights for operations and planning, and manage market-driven change.
- Sensor data is important for developing procedures and control strategies for wildfires, heatwaves, cold snaps, and other challenging conditions facing the power sector.

System visibility is key to developing robust controls and decision strategies. Traditionally, utilities owned the infrastructure that created all the data they needed to operate the power system, but this may no longer be possible. With the addition of DERs, EVs, and microgrids, utilities may be required to work with outside organizations to obtain the data they need to insure reliability and resilience. New tools are needed that allow electric sector stakeholders to capitalize on large data sets, both the ones they create and own and data from other sources (like weather data, building data, transportation data, etc), to improve reliability and resilience and meet the changing system dynamics from renewable integration.

Data Analytics demonstrations that involve direct partnerships with data providers and power sector utilities ensures that the sensor data is useful for the humans that operate, maintain and plan the power system. Information derived from sensor data should be clear and the tools developed intuitive enough to limit the need for user training.

The U.S. Department of Energy Office of Electricity (OE) is committed to

accelerating research, development, and demonstration of new technologies and tools within the electricity sector to advance reliability, resilience, and affordable operation of the power system. OE has a history of supporting this type of work through previous funding opportunities, such as FOA 1861 (Big Data Synchrophasor Analysis | Department of Energy). This past fall, OE showcased ongoing work in this space with the Power Sector Transmission & Distribution Data and Information Webinar Series that culminated in an in-person workshop. In those webinars and at the workshop OE highlighted state of the art research and development in:

- Transmission and Distribution (T&D) information sharing
- Cross-sector and Open data Sharing and Risks
- Sensors Systems and Platforms
- Sensor Data and Device Research

The webinars culminated in a summit in Washington DC, where participants discussed the importance of rapid advancement in the space of utility data analytics. Some key areas discussed where:

- Data at the Distribution and Consumer Edge
- Forecasting and Operational Analytics
- Data for Controls and Operations
- Data for T&D Coordination

The summit participants discussed the role of the standards, such as the common information model (CIM) and GridApps-D, for interoperability and to mitigate technology risks and costs associated with maintaining data sets for a variety of analytical users. It was clear from the discussions that there needs to be a shift from investment in data procurement and sensors for a single purpose, to investment in platforms and practices that allow for existing electricity system sensors to be used for multiple applications and purposes both within an organization and across organizations.

C. Objectives/Areas of Interest

The objective of this FOA is to enhance grid reliability and resilience through R&D with demonstrations of analytics that utilize power system sensors to develop tools for the grid of the future. Demonstrations with power sector utilities is required since this will help ensure that the analytics can meaningfully support power sector system planning and operations. Projects that build on/implement industry standards like CIM and existing platforms like GridAPPs-D are encouraged to help facilitate scalability, interoperability, and relevance of the work to the broader electricity industry. Primary use of synthetic data or model generated data do not meet this FOA objective.

An applicant's project team should, at a minimum, include (1) an electric utility or a system operating entity serving the area with the field demonstration, (2) a system planner relevant to the service territory of the demonstration, (3) a domestic technology product provider, and (4) a domestic technology developer. It is encouraged that teams also include universities and community organizations (such as municipalities, tribes, school districts, etc.).

The Overall FOA objectives are:

- A field demonstration of a relevant sensor utilization/data analytics technology – this should be no less than 20% of the project scope.
- Design and validate case studies that consider both rural and urban uses of sensor data for enhancing the resilience and reliability of the grid.
- Develop scalable methodologies for enabling distribution system protection using senor data.
- Develop novel methods for harnessing big data to enable automated event detection and classification.
- Establish innovative approaches for generating and recording contextual information associated with historical data to enable automated data labeling.
- Develop new approaches for capturing contextual information associated with data generated by grid sensors.
- Develop rigorously validated approaches to enable uncertainty-informed load forecasting with variable (moving) prediction time horizons as well as computationally efficient online learning; a focus on extreme weather and climate conditions is encouraged.
- Develop technology that integrates human factors and/or cognitive science considerations to enhance effectiveness of decision support systems related sensor data analytics.
- Develop uncertainty-informed data-integration methods to enable integrating data from multiple sensors and sources with variable degrees of data veracity.

Projects should have a distribution focus, but projects that look at both transmission and distribution are encouraged.

There is one area of interest for this FOA: **Sensor Data Analytics Demonstrations**

This FOA's single area of interest will be Sensor Data Analytics Demonstrations for system monitoring and control. Projects should support **at least one** of the following:

1. Demonstration of applications utilizing existing AMI data

2. Demonstration utilizing high fidelity synchronized measurement for grid stability monitoring and control
3. Demonstration of applications utilizing mixes of different sensors for improving grid resilience, security, and safety leveraging commercial off-the-shelf sensors

Demonstration of applications utilizing existing AMI data could include, but is not limited to:

- Demonstration of AMI data analysis tools for event detection that have robust data cleaning, quality control, and processing methods, and supporting tools.
- Develop and validate uses of AMI data for utility business, operations, and planning purposes. For example, using AMI load data to improve load modeling and forecasting for operations.
- Study of historical AMI data to detect load changes over time and develop methods for automatically update load models, asset health assessments, etc.
- Explore detection and study of load changes on the grid from new resources, IBRs, and changes to system power flow.
- Determine limits and tradeoffs for sensor placement, number, and visibility. Understand how visibility of the system changes with fewer, higher fidelity sensors and the associated tradeoffs.
- Collect sharable data on methods and value of data analysis utilizing AMI data.
- Develop tools that can use higher fidelity data (such as PMUs or other synchronized measurement) to improve data quality assurance for AMI data

Demonstration utilizing high fidelity synchronized measurement for grid stability monitoring and control could include, but is not limited to:

- Demonstrate and validate uses for high fidelity data synchronized measurement for power systems operations.
- Study of ambient data to identify new types of information for grid monitoring, maintenance, and control.
- Use of historical sensor data sets and event logs to create automated tools for signature identification that have automated processes for improving over time.
- Explore detection and study of dynamic changes on the grid from new resources, power electronics, IBRs, and changes to system inertia.
- Study impact of changes to short circuit level and FIDVR so that information can be used to improve and validate system models.
- Collect sharable data on methods and value of data analysis utilizing high fidelity data.

Demonstration of applications utilizing mixes of different sensors could include, but is not limited to:

- Determine limits and tradeoffs for sensor number, type, locations, and mobility.
- Develop tools that can use limited amounts of high-fidelity data to improve data quality assurance for lower fidelity grid data.
- Develop remote infrastructure monitoring for informing maintenance and control.
- Improve decision making around fire mitigation and prevention, heatwave preparedness, and other climate related reliability events.
- Incorporate new sensing technologies that identify physical security threats and improve technician and inspection safety or improve detection of physical access enabled cybersecurity attacks.
- Identify environmental hazard.

Projects should have a distribution focus but projects that include both transmission and distribution are encouraged.

Total federal funding of $7.0M will be available to research and development (R&D) and demonstrations tasks. Projects must include an R&D phase and a demonstration phase and must break out funding allocated to each. Applicant organization(s) must provide 20% cost share for the R&D phase and 50% cost share for the demonstration phase. Projects should culminate in a field demonstration – the demonstration portion of the project should be no less than 20% of the total project scope.

D. Applications Specifically Not of Interest

The following types of applications will be deemed nonresponsive and will not be reviewed or considered (See Section III, Eligibility Information; Responsiveness Criteria):

- Submissions that fall outside the technical parameters specified in Section I, “Funding Opportunity Description; Areas of Interest” of the FOA.
- Submissions for proposed technologies that are not based on sound scientific principles (e.g., violates the laws of thermodynamics).
- Projects that rely solely on “synthetic” or model generated data.
- Projects that are not focused both on R&D and Demonstration tasks.
- Submissions for proposed technologies that are not based on sound scientific principles (e.g., violates the laws of thermodynamics).

- Submissions for basic research aimed solely at discovery and/or fundamental knowledge generation.
- Submissions for large-scale demonstration projects of existing technologies.
- Submissions for proposed technologies that represent incremental improvements to existing technologies.

II. Award Information

A. Type of Application

DOE will accept only new applications under this announcement.

B. Type of Award Instrument

Cooperative Agreements
DOE anticipates awarding cooperative agreements under this FOA (See Section VI, "Award Administration Information; Statement of Substantial Involvement").

Cooperative Agreements that result from this FOA will be structured to include the R&D effort as Phase I and the demonstration effort as Phase II. A go/no-go decision point will be incorporated prior to initiation of the demonstration phase (Phase II).

C. Award Overview

DOE anticipates making between four (4) and seven (7) awards.

Federal funds available for obligation through this FOA total $7 M; funding under an award will be up to $1.00M of federal funds. Award recipient cost share must be at least 20% of the total R&D phase costs and at least 50% of the demonstration phase costs.

APPLICATIONS WHICH EXCEED THE "MAXIMUM DOE SHARE OF AWARD" SPECIFIED ABOVE WILL BE CONSIDERED NONCOMPLIANT (SEE SECTION III, "ELIGIBILITY INFORMATION; COMPLIANCE CRITERIA"). DOE WILL NOT REVIEW OR CONSIDER NONCOMPLIANT APPLICATIONS.

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. DOE may issue one, multiple or no awards.

Cooperative Agreements that result from this FOA will be structured to include the R&D effort and demonstration effort as separate phases and will include a go/no-go decision point prior to initiation of the demonstration phase. Accordingly, applications need to be prepared so that research and development (Phase I) and demonstration (Phase II) tasks (along with associated budget estimates) are segregated and can be readily identified. Moreover, since cost

share requirements differ for research and development (20%) and demonstration (50%) projects, the ability to distinguish between research and development and demonstration work will result in a more accurate determination of overall project cost share for non-government project team members.

Project continuation will be contingent upon satisfactory performance and go/no-go decision review. At the go/no-go decision points, DOE will evaluate project performance, project schedule adherence, meeting milestone objectives, compliance with reporting requirements, and overall contribution to the program goals and objectives. As a result of this evaluation, DOE will make a determination to continue the project, re-direct the project, or discontinue funding the project. If at the end of Phase I, DOE makes a determination that sufficient progress has not been made under the award and further demonstration is not in the best interest of additional government funding, DOE may decide not to proceed with the Phase II effort.

DOE expects to make Federal funding available for new awards under this FOA as follows:

Areas of Interest with Cost Share

Area of Interest	Estimated Federal Funding	Anticipated No. of Awards	Anticipated Individual Award Size		
			DOE Share $/%	Cost Share $/%	Total $
1	$7,000,000	7	$1,000,000/71%	$400,000/29%	$1,400,000
Total					

i. Estimated Project Period of Performance

DOE anticipates making awards with an estimated project period of performance not to exceed 3 years. All awards will have a single budget period. It is anticipated that the research and development phase would be approximately up to 2 years and the demonstration phase would be a portion or the entirety of the remaining year. The demonstration phase must be at least 20% of the project period of performance.

III. Eligibility Information

To be considered for substantive evaluation, an applicant's submission must meet the criteria set forth below. If the application does not meet these eligibility requirements, it will be considered ineligible and removed from further evaluation.

A. Eligible Applicants

i. Restricted Eligibility

In accordance with 2 CFR 910.126, Competition, eligibility for award is restricted to applications that include a utility as either the prime recipient or sub-recipient in a team structure. DOE is restricting eligibility to allow for a more targeted approach that closely couples the resulting analytical RD&D projects and maximizes the impact. Utilities can provide realistic operational data so that researchers can better understand the unique challenges and develop practical solutions for broad adoption. This approach aligns with congressional direction while optimizing the effectiveness of the demonstration activities.

Eligible Applicants

The proposed project team must include a prime recipient and/or subrecipient(s) that meets the below definition of a domestic utility. Under this FOA, a utility is defined as follows:

1. Rural electric cooperatives;
2. Utilities owned by a political subdivision of a State, such as a municipally owned electric utility;
3. Utilities owned by any agency, authority, corporation, or instrumentality of one or more political subdivisions of a State;
4. Investor-owned electric utilities (IOUs)
5. Electric wire owning and/or operating entities.

To be eligible, proposed projects must include a utility with the following mandatory roles and responsibilities:

1. Any developed analytical technologies are to culminate in an integrated demonstration within a utility's systems, such as those for planning or operations, using field data to build the confidence that the developed solutions function as expected within the utility environment. A field demonstration within the utility space is a critical key to success.

2. The utility must provide advice and guidance on the proposed solution in

terms of use, performance, scalability, integration, feasibility, and practicality in an operational setting.

ii. Individuals

U.S. citizens and lawful permanent residents are eligible to apply for funding as a prime recipient or subrecipient.

iii. Domestic Entities

The proposed prime recipient and subrecipient(s) must be domestic entities. The following types of domestic entities are eligible to participate as a prime recipient or subrecipient of this FOA:

1. Institutions of higher education;
2. For-profit entities;
3. Non-profit entities; and
4. State and local governmental entities, and Indian Tribes.

To qualify as a domestic entity, the entity must be organized, chartered or incorporated (or otherwise formed) under the laws of a particular state or territory of the United States; have majority domestic ownership and control; and have a physical place of business in the United States.

DOE/NNSA FFRDCs are eligible to apply for funding as a subrecipient, but are not eligible to apply as a prime recipient.

NETL is not eligible for award under this announcement and may not be proposed as a subrecipient on another entity's application. An application that includes NETL as a prime recipient or subrecipient will be considered non-responsive.

Non-DOE/NNSA FFRDCs are eligible to participate as a subrecipient, but are not eligible to apply as a prime recipient.

Federal agencies and instrumentalities (other than DOE) are eligible to participate as a subrecipient, but are not eligible to apply as a prime recipient.

Entities banned from doing business with the United States government, such as entities debarred, suspended, or otherwise excluded from or ineligible for participating in Federal programs, are not eligible.

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

Foreign Entities

In limited circumstances, DOE may approve a waiver to allow a foreign entity to participate as a prime recipient or subrecipient. A foreign entity may submit a Full Application to this FOA, but the Full Application must be accompanied by an explicit written waiver request. Likewise, if the applicant seeks to include a foreign entity as a subrecipient, the applicant must submit a separate explicit written waiver request in the Full Application for each proposed foreign subrecipient.

Appendix B lists the information that must be included in a foreign entity waiver request. The applicant does not have the right to appeal DOE's decision concerning a waiver request.

A. Cost Sharing

Cost Share 20% and 50%

The cost share must be at least 20% of the total allowable costs[1] for research and development projects and 50% of the total allowable costs for demonstration and commercial application projects and must come from non-Federal sources unless otherwise allowed by law. The sum of the government share, including FFRDC/NL costs if applicable, and the recipient share of allowable costs equals the total allowable cost of the project. (See 2 CFR part 200.306 as amended by 2 CFR part 910.130 for the applicable cost sharing requirements.) Applications need to be prepared so that research and development (Phase I) and demonstration (Phase II) tasks (along with associated budget estimates) are segregated and can be readily identified. Moreover, since cost share requirements differ for research and development (20%) and demonstration (50%) scope, the ability to distinguish between research and development and demonstration work will result in a more accurate determination of overall project cost share.

DOE understands that projects selected under this FOA may require the use of existing data. For purposes of this FOA, DOE will consider data that is commercially available at an established market price to be an allowable cost under the project (either as DOE share or non-federal cost share) but DOE will not consider in-kind data (e.g., data, owned by an entity, that is not routinely sold commercially but is instead donated to the project and assigned a value) to be an allowable cost under the project, including as Recipient cost share. Estimation methods used by the Recipient to assign a value to in-kind data cannot be objectively verified by DOE and therefore will not be accepted by DOE

[1] Total project costs is the sum of the government share, including FFRDC costs if applicable, and the recipient share of project costs.

as an allowable cost under any project selected from this FOA. Consequently, DOE will not recognize in-kind data costs in any resulting DOE-approved budget.

To assist applicants in calculating proper cost share amounts, DOE has included a cost share information sheet and sample cost share calculation in the "Cost Share Information" Appendix A of this FOA.

i. Legal Responsibility

Applicants will be bound by the cost share proposed in their applications and incorporated into their award.

The cost share requirement applies to the project as a whole, including work performed by members of the project team other than the Prime Recipient. The Prime Recipient is legally responsible for paying the entire cost share. The Prime Recipient's cost share obligation is expressed in the Assistance Agreement as a static amount in U.S. dollars (cost share amount) and as a percentage of the Total Project Cost (cost share percentage). If the funding agreement is terminated prior to the end of the project period, the Prime Recipient is required to contribute at least the cost share percentage of total expenditures incurred through the date of termination.

The Prime Recipient is solely responsible for managing cost share contributions by the Project Team and enforcing cost share obligation assumed by Project Team members in subawards or related agreements.

ii. Cost Share Allocation

Each Project Team is free to determine how best to allocate the cost share requirement among the team members. The amount contributed by individual Project Team members may vary, as long as the cost share requirement for the project as a whole is met.

iii. Cost Share Types and Allowability

Every cost share contribution must be allowable under the applicable Federal cost principles, as described in Section IV, "Application and Submission Information; Funding Restrictions". In addition, cost share must be verifiable upon submission of the Full Application. Cost share may be provided in the form of cash or cash equivalents, or in-kind contributions. Cost share must come from non-federal sources (unless otherwise allowed by law), such as project participants, state or local governments, or other third-party financing. A DOE Loan or Loan Guarantee cannot be leveraged by applicants to provide the required cost share or otherwise support the same scope that is proposed under a project.

Cost share may be provided by the prime recipient, subrecipients, or third parties (entities that do not have a role in performing the scope of work). Vendors/contractors may not provide cost share. Any partial donation of goods or services is considered a discount and is not allowable.

Cash contributions include, but are not limited to: personnel costs, fringe costs, supply and equipment costs, indirect costs and other direct costs.

In-kind contributions are those where a value of the contribution can be readily determined, verified and justified but where no actual cash is transacted in securing the good or service comprising the contribution. Allowable in-kind contributions include but are not limited to: the donation of volunteer time or the donation of space or use of equipment.

Project teams may use funding or property received from state or local governments to meet the cost share requirement, so long as Federal Government did not provide the funding to the state or local government.

The Recipient may not use the following sources to meet its cost share obligations including, but not limited to:

- Revenues or royalties from the prospective operation of an activity beyond the project period;
- Proceeds from the prospective sale of an asset of an activity;
- Federal funding or property (e.g., Federal grants, equipment owned by the Federal Government); or
- Expenditures that were reimbursed under a separate Federal Program.

Project Teams may not use the same cash or in-kind contributions to meet cost share requirements for more than one project or program.

Cost share contributions must be specified in the project budget, verifiable from the Prime Recipient's records, and necessary and reasonable for proper and efficient accomplishment of the project. As all sources of cost share are considered part of total project cost, the cost share dollars will be scrutinized under the same Federal regulations as Federal dollars to the project. Every cost share contribution must be reviewed and approved in advance by the Contracting Officer and incorporated into the project budget before the expenditures are incurred.

Applicants are encouraged to refer to 2 CFR 200.306 as amended by 2 CFR 910.130 for additional cost sharing requirements.

Please refer to the "Cost Share Information" Appendix A of the FOA.

iv. Cost Share Verification

Applicants are required to provide written assurance of their proposed cost share contributions in their Full Applications.

Upon selection for award negotiations, applicants are required to provide additional information and documentation regarding their cost share contributions. Please refer to the "Cost Share Information" Appendix A of the FOA.

v. Cost Share Contributions by FFRDCs

Because FFRDCs and NLs are funded by the Federal Government, costs incurred by FFRDCs and NLs generally may not be used to meet the cost share requirement. FFRDCs and NLs may contribute cost share only if the contributions are paid directly from the contractor's Management Fee or another non-Federal source. In such instance, the FFRDC and NLs must certify in writing that the cost share comes from non-Federal sources.

B. Compliance Criteria

A review of all submitted documents and information is performed to determine if the submissions are in compliance with the FOA requirements. **All submitted information and documents must meet all Compliance Criteria listed below to be eligible for review or the submission will be considered noncompliant. DOE will NOT review or consider noncompliant submissions**.

Concept Papers. Concept Papers are deemed compliant if:

- The Concept Paper complies with the content and form requirements in Section IV, "Application and Submission Information; Form and Content Requirements" and Section IV, "Application and Submission Information; Concept Papers" of the FOA; and
- The applicant successfully emailed all required documents to ConceptPapersFOA3127@netl.doe.gov by the deadline stated in this FOA. DOE will not extend the submission deadline for applicants that fail to submit required information by the applicable deadline due to server/connection congestion.

Full Applications. Full Applications are deemed compliant if:

- The applicant submitted a compliant/responsive Concept Paper;

- The Full Application complies with the DOE share of the individual award size in Section II, “Award Information; Award Overview” of the FOA;
- The Full Application complies with the content and form requirements in Section IV, “Application and Submission Information; Form and Content Requirements,” and Section IV, “Application and Submission Information; Full Applications “of the FOA; and
- The applicant successfully uploaded all required documents and clicked the “Submit” button in Grants.gov by the deadline stated in the FOA. DOE will not extend the submission deadline for applicants that fail to submit required information by the applicable deadline due to server/connection congestion.

C. Responsiveness Criteria

A review of all submitted documents and information is performed to determine if the submissions are responsive to the FOA requirements. **All submitted information and documents must meet all of the Responsiveness Criteria listed below to be eligible for review or the submission will be considered non-responsive. DOE will NOT review or consider non-responsive submissions.**

Concept Papers. Concept Papers are deemed responsive if:

- They meet the Concept Paper review criteria set forth in Section V, “Application and Review Information; Concept Paper Review” of the FOA.

Only applicants who have submitted a compliant/responsive Concept Paper will be eligible to submit a Full Application.

Full Applications. Full Applications are deemed responsive if:

- The application meets the technical requirements as described in the “Objectives/Areas of Interest” contained in Section I, “Funding Opportunity Description” of the FOA; and
- The Applicant/application meets the Eligibility Criteria in Section III of the FOA.

Only compliant/responsive applications will be eligible for a comprehensive merit review.

D. Number of Submittals Eligible for Review

Applicants may submit multiple applications under the area of interest of this FOA; Each submitted application should be distinct and tailored to the area of interest.

E. Questions Regarding Eligibility

DOE will not make eligibility determinations for potential applicants prior to the date on which applications to this FOA must be submitted. The decision whether to submit an application in response to this FOA lies solely with the applicant.

IV. Application and Submission Information

F. Form and Content Requirements

All submissions must conform to the following form and content requirements, including maximum page limits (described below) and must be submitted as specifically stated. DOE will not review or consider submissions submitted through means other than specifically stated in the FOA, submissions submitted after the applicable deadline, and incomplete submissions. DOE will not extend deadlines for applicants who fail to submit required information and documents by the applicable deadline due to server/connection congestion.

The Concept Paper and Full Application must conform to the following requirements:

- Each must be submitted in Adobe PDF format unless stated otherwise.
- Each must be written in English.
- All pages must be formatted to fit on 8.5 x 11" paper with margins not less than one inch on every side. Use Times New Roman typeface, a black font color, and a font size of 11 point or larger (except in figures or tables, which may be 10 point font). A symbol font may be used to insert Greek letters or special characters, but the font size requirement still applies. References must be included as footnotes or endnotes in a font size of 10 or larger. Footnotes and endnotes are counted toward the maximum page requirement.
- Each submission must not exceed the specified maximum page limit when printed using the formatting requirements set forth above and **single** spaced. The maximum page limit includes the cover page, references, charts, graphs, data, maps, photographs, and other reference material the applicant may include with the submission. If applicants exceed the maximum page limits indicated below, DOE will review only the authorized number of pages and disregard any additional pages.

Applicants are responsible for meeting each submission deadline. Applicants are strongly encouraged to submit their Concept Paper and Full Applications at least 48 hours in advance of the submission deadline. Under normal conditions (i.e., at least 48 hours in advance of the submission deadline), applicants should allow at least 1 hour to submit a Concept Paper or Full Application. Once the Concept Paper or Full Application is submitted, applicants may revise or update that submission until the expiration of the applicable deadline. If changes are made, the applicant must resubmit the Concept Paper and/or Full Application, before the applicable deadline.

DOE urges applicants to carefully review their Concept Papers and Full Applications and to allow sufficient time for the submission of required information and documents. All Full Applications that pass the initial eligibility review will undergo comprehensive technical merit review according to the criteria identified in Section V, "Application and Submission Information; Review Criteria" of the FOA.

G. Concept Papers

To be eligible to submit a Full Application, applicants must submit a Concept Paper by the specified due date and time on the FOA cover page. Save the Concept Paper in a single file named " RecipientName.PDF".

Concept Papers must be submitted via email to ConceptPapersFOA3127@netl.doe.gov. The subject line of the e-mail MUST include the Area of Interest the Applicant is responding to and read as follows "Area of Interest 1 Concept Paper FOA 3127". Any other form of submission will not be accepted. **APPLICANTS WHO DO NOT SUBMIT A CONCEPT PAPER CANNOT SUBMIT A FULL APPLICATION.**

DOE makes an independent assessment of each Concept Paper based on the criteria in Section V, "Application Review Information; Review Criteria" of the FOA. DOE will encourage a subset of applicants to submit Full Applications. Other applicants will be discouraged from submitting a Full Application. An applicant who receives a "discouraged" notification may still submit a Full Application. DOE will review all eligible Full Applications; however, by discouraging the submission of Full Application, DOE intends to convey its lack of programmatic interest in the proposed project in an effort to save the applicant the time and expense of preparing an application that is unlikely to be selected for award negotiations.

DOE may include general comments provided from reviewers on an applicant's Concept Paper in the encourage/discourage notification sent to applicants at the close of that phase.

i. Content and Form Requirements for Concept Papers

DOE will not review or consider ineligible Concept Papers (see Section III, "Eligibility Information; Compliance Criteria" of the FOA).

Each Concept Paper must be limited to a **single** area of interest. Concepts or technologies unrelated to the specific area of interest should not be consolidated into a single Concept Paper.

The Concept Paper must conform to the following content requirements:

Section	Maximum Page Limit*	Description
Cover Page	Included in the page limitation	The cover page should include the project title, the specific FOA area of interest being addressed, both the technical and business points of contact, names of all team member organizations, and any statements regarding confidentiality. A sample Concept Paper Cover Page is included as an attachment to this announcement.
Technology Description	Included in the page limitation	Applicants are required to describe succinctly: • The proposed technology, including its basic operating principles and how it is unique and innovative; • The proposed technology's target level of performance (applicants should provide technical data or other support to show how the proposed target could be met); • The current state-of-the-art in the relevant field and application, including key shortcomings, limitations, and challenges; • How the proposed technology will overcome the shortcomings, limitations, and challenges in the relevant field and application; • How the project will use existing industry standards, best practices and platforms/frameworks that address interoperability and scalability of the technology; • The key technical risks/issues associated with the proposed technology development plan and potential mitigations; and • The potential impact that funding the proposed project would have on developing the proposed technology for the relevant field and application.

Project Team/Addendum	Included in the page limitation	Applicants are required to describe succinctly the qualifications, experience, and capabilities of the proposed Project Team, including: • Whether the Principal Investigator (PI) and Project Team have the skill and expertise needed to successfully execute the project plan; • Whether the applicant has prior experience which demonstrates an ability to perform tasks of similar risk and complexity; • Whether the applicant has worked together with its teaming partners on prior projects or programs; and • Whether the applicant has adequate access to equipment and facilities necessary to accomplish the effort and/or clearly explain how it intends to obtain access to the necessary equipment and facilities. Applicants may also use the Project Team/Addendum section to provide photographs, maps, references, graphs, charts, or other data to supplement their Technology Description. However, the Project Team/ Addendum section, inclusive of any supplemental photograph, maps, references, graphs, charts, or other data, may not exceed the maximum page limit for the section specified in the preceding column.

*As indicated above, maximum page limits have been established for the concept paper (inclusive of references inserted as footnotes and/or endnotes) and when totaled together should not exceed 5 pages.

H. Full Applications

Applicants must submit a Full Application by the specified due date and time to be considered for funding under this FOA. Applicants must complete the mandatory forms and any applicable optional forms (e.g., SF-LLL- Disclosure of Lobbying Activities) in accordance with the instructions on the forms and the additional instructions below. Files that are attached to the forms must be in Adobe Portable Document Format (PDF) unless otherwise specified in this announcement.

i. Application Package

Application forms and instructions are available at https://www.grants.gov/.

ii. Content and Form of Full Application

DOE will not review or consider ineligible Full Applications (see Section III, "Eligibility Information; Compliance Criteria" of the FOA).

Each Full Application must be limited to a **single** area of interest. Concepts or technologies unrelated to the specific area of interest should not be consolidated into a single Full Application.

Full Applications must conform to the following requirements:

Submission	Components	Format	File Name
Full Application (PDF, unless stated otherwise)	SF-424	Form	N/A
	Project/Performance Site Location(s)	Form	N/A
	Project Narrative (25 page limitation, see chart below for further instruction)	PDF	Project.pdf
	Summary for Public Release (1 page limit)	PDF	Summary.pdf
	Project Management Plan (20 page limitation, see chart below for further instruction)	PDF	PMP.pdf
	Resume	PDF	Resume.pdf
	SF424A Budget Information – Non-Construction Programs File	Microsoft Excel	SF424A.xls or .xlsx
	Budget Justification – SEE DETAILED INSTRUCTIONS BELOW	Microsoft Excel	RecipientBudget Justification.xls or .xlsx
	Subaward Budget Justification, if applicable – SEE DETAILED INSTRUCTIONS BELOW	Microsoft Excel	Subawardee_name BudgetJustification.xls or xlsx
	Budget for DOE/NNSA FFRDC/NL or non-DOE/NNSA FFRDC/NL, if applicable	PDF	Use up to 10 letters of the FFRDC/NL name plus "Budget" as the file name (e.g., FFRDC/NL_nameBudget.xls or xlsx), and click on "Add Optional Other Attachment" to attach.

	Authorization from cognizant Contracting Officer for DOE/NNSA FFRDC/NL or non-DOE FFRDC/NL, if applicable	PDF	Use up to 10 letters of the FFRDC/NL name plus FFRDC as the file name (e.g. anlFFRDC or lincolnFFRDC.pdf)
	Environmental Questionnaire	PDF	Env.pdf
	Cost Share Commitment Letters, if applicable	PDF	CSCL.pdf
	Team Member Commitment Letter(s), if applicable		TMCL.pdf
	SF-LLL Disclosure of Lobbying Activities, if applicable	Form	N/A
	Foreign Entity Participation Waiver Requests if applicable	PDF	FN_Waiver.pdf
	Performance of Work in the United States waiver request, if applicable	PDF	PerformanceofWork_Waiver.pdf
	Data Management Plan	PDF	DMP.pdf
	Current and Pending Support	PDF	CPS.pdf
	Transparency of Foreign Connections	PDF	BusinessSensitive.pdf
	Potentially Duplicative Funding	PDF	PDFN.pdf

Note: The maximum file size that can be uploaded to the Grants.gov website is 10MB. Files in excess of 10MB cannot be uploaded, and hence cannot be submitted for review. If a file exceeds 10MB but is still within the maximum page limit specified in the FOA, it must be broken into parts and denoted to that effect. For example:

Project Part 1
Project Part 2, etc.

DOE will not accept late submissions that resulted from technical difficulties due to uploading files that exceed 10MB.

Detailed guidance on the content and form of each component is listed below.

iii. SF-424: Application for Federal Assistance

Complete the SF 424 form first to populate data in other forms. Complete all required fields in accordance with the instructions on the form. The list of certifications and assurances in Field 21 can be found at

https://www.energy.gov/management/financial-assistance-forms-and-information-applicants-and-recipients, under Certifications and Assurances.

iv. Project/Performance Site Location(s)

Indicate the primary site where the work will be performed by the prime recipient or subrecipient(s). 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.

v. Other Attachments Form

Submit the following files with your application and attach them to the Other Attachments Form. Click on "Add Mandatory Other Attachment" to attach the Project Narrative. Click on "Add Optional Other Attachment," to attach the other files.

vi. Project Narrative File – Mandatory Other Attachment

The Project Narrative File must be submitted in Adobe PDF format. The project narrative must not exceed 25pages, including cover page, table of contents, footnotes/endnotes, charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard 8.5" by 11" paper with 1"margins (top, bottom, left, and right) **single** spaced. The font must not be smaller than 11 point. The **Identification of Potential Conflicts of Interest or Bias in Selection of Reviewers, and Bibliography sections are NOT included in the project narrative page limitation**. Do not include any Internet addresses (URLs) that provide information necessary to review the application. See Section VIII, "Other Information; Treatment of Application Information" for instructions on how to mark proprietary application information.

EVALUATORS WILL REVIEW ONLY THE NUMBER OF PAGES INDICATED ABOVE.

Save the information in a single file named "Project.pdf," and click on "Add Mandatory Other Attachment" to attach.
The project narrative (**25** page limitation) must include:

SECTION	MAXIMUM PAGE LIMIT* (if applicable)	DESCRIPTION
Cover Page	Included in the page limitation (1-page maximum)	The cover page should include the project title, the Applicant's name, and the names of all team member organizations. In addition, provide the Applicant's technical and business points of contact along with e-mail addresses and telephone numbers, names of project manager, Senior/Key personnel and their organizations. The cover page should also include the federal and non-federal share of costs associated with each team member's proposed effort. Applicants should ensure the cost information is consistent with the submitted budget justification(s). A sample Project Narrative Cover Page is included as an attachment to this announcement.
Table of Contents	Included in the page limitation	Applicant to capture, at a minimum, all of the required sections identified in this table.
Project Objectives	Included in the page limitation	This section should provide a clear, concise statement of the specific objectives/aims of the proposed project. Buy America Requirements for Infrastructure Projects: Within the first two (2) pages of the Narrative, include a short statement on whether the project will involve the construction, alteration, and/or repair of infrastructure in the United States. See the "Required Use of American Iron, Steel, Manufactured Products, and Construction Materials – Buy America Requirements for Infrastructure Projects" Appendix C for applicable definitions and other information to inform this statement.
Merit Review Criterion Discussion	Included in the page limitation	The section should be formatted to address each of the merit review criterion and sub-criterion listed in Section V, "Application Review Information; Review Criteria". Provide sufficient information so that reviewers will be able to evaluate the application in accordance with these merit review criteria. DOE/NNSA WILL EVALUATE AND CONSIDER ONLY THOSE APPLICATIONS THAT ADDRESS SEPARATELY EACH OF THE MERIT REVIEW CRITERION AND SUB-CRITERION.

Statement of Project Objectives	**Included in the page limitation**	The project narrative must contain a single, detailed Statement of Project Objectives that addresses how the project objectives will be met. The Statement of Project Objectives must contain a clear, concise description of all activities to be completed during project performance. It is therefore required that it shall not contain proprietary or confidential business information. The Statement of Project Objectives is generally less than five (5) pages in total for the proposed work. Applicants shall prepare the Statement of Project Objectives in the format provided in the "Statement of Project objectives Template" Appendix D of the FOA.
Relevance and Outcomes/Impacts	Included in the page limitation	This section should explain the relevance of the effort to the objectives in the program announcement and the expected outcomes and/or impacts. The justification for the proposed project should include a clear statement of the importance of the project in terms of the utility of the outcomes and the target community of beneficiaries.
Roles of Participants	Included in the page limitation	For multi-organizational or multi-investigator projects, describe the roles and the work to be performed by each participant/investigator, business agreements between the applicant and participants, and how the various efforts will be integrated and managed.
Multiple Principal Investigators	Included in the page limitation	The applicant, whether a single organization or team/partnership/consortium, must indicate if the project will include multiple PIs. This decision is solely the responsibility of the applicant. If multiple PIs will be designated, the application must identify the Contact PI/Project Coordinator and provide a "Coordination and Management Plan" that describes the organization structure of the project as it pertains to the designation of multiple PIs. This plan should, at a minimum, include: - process for making decisions on scientific/technical direction; - publications; - intellectual property issues; - communication plans; - procedures for resolving conflicts; and - PIs' roles and administrative, technical, and scientific responsibilities for the project.

Facilities and Other Resources	Included in the page limitation	Identify the facilities (e.g., office, laboratory, computer, etc.) to be used at each performance site listed and, 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. Provide any information describing the other resources available to the project such as machine and electronics shops.
Equipment	Included in the page limitation	List important items of equipment already available for this project and, if appropriate, note the location and pertinent capabilities of each. If you are proposing to acquire equipment, describe comparable equipment, if any, already at your organization and explain why it cannot be used.
Identification of Potential Conflicts of Interest or Bias in Selection of Reviewers	**Not included in the page limitation**	Provide the following information in this section: ▪ Collaborators and Co-editors: List in alphabetical order all persons, including their current organizational affiliation, who are, or who have been, collaborators or co-authors with you on a research project, book or book article, report, abstract, or paper during the 48 months preceding the submission of this application. Also, list any individuals who are currently, or have been, co-editors with you on a special issue of a journal, compendium, or conference proceedings during the 24 months preceding the submission of this application. If there are no collaborators or co-editors to report, state "None." ▪ Graduate and Postdoctoral Advisors and Advisees: List the names and current organizational affiliations of your graduate advisor(s) and principal postdoctoral sponsor(s) during the last 5 years. Also, list the names and current organizational affiliations of your graduate students and postdoctoral associates.
Bibliography	Not included in the page limitation	If applicable: Provide a bibliography for any references cited in the Project Narrative section. This section must include only bibliographic citations.

*As indicated above, a maximum page limit has been established for the project narrative so when the project narrative sections identified in the table above as included in the page limitation are totaled together (including the cover page, table of contents, footnotes/endnotes, charts, graphs, maps, photographs, and other pictorial presentations) it

should not exceed 25 pages. Full Applications which do not conform to ALL of the requirements listed above will be considered noncompliant (See Section III, "Eligibility Information; Compliance Criteria"). DOE will not review or consider noncompliant submissions.

vii. Summary for Public Release File (April 2023)

The project summary/abstract must contain a one-page summary of the proposed activity suitable for dissemination to the public. It should be a self-contained document that identifies the name of the applicant, the project director/principal investigator(s), the project title, the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (i.e., benefits, outcomes), major participants (for collaborative projects). This document must not include any proprietary or sensitive business information as the Department may make it available to the public after selections. The project summary must not exceed one (1) page when printed using standard 8.5" by 11" paper with 1" margins (top, bottom, left and right) **single** spaced with font no smaller than 11 point. Save this information in a file named "Summary.pdf," and click on "Add Optional Other Attachment" to attach.

viii. Project Management Plan

The Project Management Plan (PMP) must not exceed twenty (20) pages including cover page, table of contents, footnotes/endnotes, charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard 8.5" by 11" paper with 1" margins (top, bottom, left and right) **single** spaced with font no smaller than 11 point. Applicants shall prepare the PMP in the format provided in the "Project Management Plan Template" Appendix E of the FOA. Save this information in a file named "PMP.pdf," and click on "Add Optional Other Attachment" to attach.

ix. Resume File (April 2023)

Provide a resume for each key person proposed, including subawardees and consultants if they meet the definition of key person. A key person is any individual who contributes in a substantive, measurable way to the execution of the project. The biographical information for each resume must not exceed 3 pages when printed on 8.5" by 11" paper with 1" margins (top, bottom, left, and right) **single** spaced with font no smaller than 11 point and should include the following information, if applicable:

- Contact Information;

- Education and Training. Undergraduate, graduate and postdoctoral training, provide institution, major/area, degree and year.
- Research and Professional Experience. Beginning with the current position list, in chronological order, professional/academic positions with a brief description. List all current academic, professional, or institutional appointments, foreign or domestic, at the applicant institution or elsewhere, whether or not remuneration is received, and, whether full-time, part-time, or voluntary;
- Awards and honors;
- 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. 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;
- Patents, copyrights, and software systems developed may be provided in addition to or substituted for publications.
- Synergistic Activities. List no more than 5 professional and scholarly activities related to the effort proposed.
- There should be no lapses in time over the past ten years or since age 18, which ever time period is shorter.

As an alternative to a resume, it is acceptable to use the biographical sketch format approved by the National Science Foundation (NSF). The biographical sketch format may be generated by the Science Experts Network Curriculum Vita (SciENcv), a cooperative venture maintained at https://www.ncbi.nlm.nih.gov/sciencv/, and is also available at https://nsf.gov/bfa/dias/policy/nsfapprovedformats/biosketch.pdf. The use of a format required by another agency is intended to reduce the administrative burden to researchers by promoting the use of common formats.

Save all resumes in a single file named "Resume.pdf" and click on "Add Optional Other Attachment" to attach.

x. SF 424A Budget Information – Non-Construction Programs (SF424) File

You must provide a separate budget for each year of support requested and a cumulative budget for the total project period of performance. Use the SF 424 A Excel, "Budget Information - Non Construction Programs" form on the DOE Financial Assistance Forms Page at

https://www.energy.gov/management/financial-assistance-forms-and-information-applicants-and-recipients under DOE budget forms.

You may request funds under any of the Object Class Categories as long as the item and amount are necessary to perform the proposed work, meet all the criteria for allowability under the applicable Federal cost principles, and are not prohibited by the funding restrictions in this announcement (See Section IV, "Application and Submission Information; Funding Restrictions"). Save the information in a single file named "SF424A.xls or xlsx," and click on "Add Optional Other Attachment" to attach.

xi. Budget Justification File

Applicants are required to provide a detailed budget justification for the project as a whole, including all work to be performed by the Applicant and its Subrecipients and Contractors, and provide all requested documentation (e.g., a Federally-approved rate agreement, contractor quotes). Applicants should include costs associated with the Buy America Requirements for Infrastructure projects required annual audits and incurred cost proposals in their proposed budget documents. Such costs may be reimbursed as direct or indirect costs.

The ~~A~~ Budget Justification workbook for use and to describe the level of detail required in the budget justification is ~~included as an attachment to this announcement~~ at the link below, labeled SF 424 Budget Justification Workbook (3 Budget Periods). Although the data requested is mandatory, the use of the budget justification workbook is not. Please show Phase 1 research and development costs in "Budget Period 1" and Phase 2 demonstration costs in "Budget Period 2":

See: https://netl.doe.gov/business/business-forms/financial-assistance

The "Instructions and Summary" included with the Budget Justification workbook will auto-populate as the applicant enters information into the workbook. Applicants must carefully read the "Instructions and Summary" tab provided within the Budget Justification workbook. In addition, Applicants must carefully read and note each "Instructions" Summary contained within each individual tab of the Budget Justification workbook. **As stipulated within the Budget Justification workbook, all direct costs must be identified by specific task. All cost should include the basis of cost and justification of need, as applicable. Of specific note is the necessity to identify personnel costs for each individual proposed for all tasks to which they are assigned.** Note EXAMPLES provided within each tab for further clarification.

DOE understands that projects selected under this FOA may require the use of existing data. For purposes of this FOA, DOE will consider data that is commercially available at an established price to be an allowable cost under the project (either as DOE share or non-federal cost share) but DOE will not consider in-kind data (e.g., data, owned by an entity, that is not routinely sold commercially but is instead donated to the project and assigned a value) to be an allowable cost under the project, including as Recipient cost share. Estimation methods used by the Recipient to assign a value to in-kind data cannot be objectively verified by DOE and therefore will not be accepted by DOE as an allowable cost under any project selected from this FOA. Consequently, DOE will not recognize in-kind data costs in any resulting approved DOE budget.

~~See: https://netl.doe.gov/business/business-forms/financial-assistance~~

Save the Budget Justification workbook in a single file named "RecipientBudgetJustification.xls or xlsx" and click on "Add Optional Other Attachment" to attach.

xii. Subaward Budget Justification (if applicable)

Applicants must provide a separate detailed budget justification for each subrecipient that is expected to perform work estimated to be more than $250,000 or 25% of the total work effort (whichever is less). A Budget Justification workbook is included as an attachment to this announcement. Although the data requested is mandatory, the use of the budget justification workbook is not. Applicants are requested to reflect costs for Phase 1 (20% cost share requirement) of the workbook and for Phase 2 (50% cost share requirement) of the workbook.

The level of detail to be included in the subaward budget justification (if applicable) must be commensurate with that provided by the Prime Recipient. Save the information in a single file named "Subawardee_name BudgetJustification.xls or xlsx" and click on "Add Optional Other Attachment" to attach.

xiii. Budget for DOE/NNSA FFRDC/NLs or non-DOE/NNSA FFRDC/NLs, (if applicable)

If proposed, FFRDC/NLs will be treated as subawards for applicants. Therefore, prepare the budgets utilizing rates appropriate for such an arrangement. You must provide a separate detailed budget justification for each FFRDC/NL proposed that is expected to perform work estimated to be more than $250,000

or 25% of the total work effort (whichever is less). A Budget Justification workbook is included as an attachment to this announcement. Although the data requested is mandatory, the use of the budget justification workbook is not. The level of detail to be included in the FFRDC/NL budget justification (if applicable) must be commensurate with that provided by the Prime Recipient. Use up to 10 letters of the FFRDC/NL name plus "Budget" as the file name (e.g., FFRDC/NL_nameBudget.xls or xlsx), and click on "Add Optional Other Attachment" to attach.

If a DOE/NNSA FFRDC/NL is to perform a portion of the work, you shall use the Department's Strategic Partnership Projects program in accordance with the requirements of DOE Order 481.1 Strategic Partnership Projects (SPP) [formerly known as "Work for Others" (WFO)]. This order and the applicable terms and conditions are available at https://www.directives.doe.gov/directives-documents/400-series/0481.1-BOrder-e-chg1-ltdchg. Subawards to other FFRDCs will utilize the terms and conditions of the sponsoring agency.

xiv. Authorization for DOE/NNSA FFRDC/NLs or non-DOE/NNSA FFRDCs/NLs (if applicable)

The cognizant contracting officer for the DOE/NNSA FFRDC/NL or the non-DOE/NNSA Federal agency sponsoring the FFRDC must authorize in writing the use of the FFRDC on the proposed project, and this authorization, as specified in Section III, "Eligibility Information" of the FOA, must be submitted with the application. The use of a FFRDC must be consistent with the contractor's authority under its award. Use up to 10 letters of the FFRDC name plus FFRDC as the file name (e.g., lanlFFRDC.pdf or lincolnFFRDC.pdf), and click on "Add Optional Other Attachment" to attach.

xv. Environmental Questionnaire

The Applicant must submit an environmental questionnaire providing for the work of the entire project. The Applicant is also responsible for submitting a separate environmental questionnaire for each proposed subrecipient performing at a different location. The environmental questionnaire is available at https://netl.doe.gov/sites/default/files/2018-02/451_1-1-3.pdf. Save the questionnaire in a single file named "Env.pdf" (or "Env-FILL IN TEAM MEMBER.pdf" if more than questionnaire is submitted) and click on "Add Optional Other Attachment" to attach.

NOTE: If selected for award and if a subrecipient's location is not known at the time of application, a subsequent environmental questionnaire will be needed prior to them beginning work at an alternate location.

xvi. Cost Share Commitment Letters (if applicable)

Cost share commitment letters are required from any party (other than the organization submitting the application) proposing to provide all or part of the required cost share (including subrecipients). The letter should state the party is committed to providing a specific minimum dollar amount of cost share, identify the type of proposed cost share (e.g., cash, services, and/or property) to be contributed, and be signed by the person authorized to commit the expenditure of funds by the entity. The applicant should submit the letter(s) in PDF format. Save this information in a single file named “CSCL.pdf" and click on "Add Optional Other Attachment” to attach.

xvii. Team Member Commitment Letter(s) (if applicable)

Letters should demonstrate the team member’s level of commitment to the project, such as data access and/or advisory services. Letter(s) must be signed by the person authorized to commit resources on behalf of the organization and be provided in PDF format. Save this information in a single file named “TMCL.pdf” and click on “Add Optional Other Attachment” to attach.

xviii. SF-LLL: Disclosure of Lobbying Activities (if applicable)

Recipients and Subrecipients may not use any Federal funds to influence or attempt to influence, directly or indirectly, congressional action on any legislative or appropriation matters.

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

xix. Waiver Requests (if applicable) (April 2023)

i. Foreign Entity Participation

For projects selected under this FOA, all recipients and subrecipients must qualify as domestic entities. See Section III, “Eligibility Information; Eligible Applicants”. To request a waiver of this requirement, the applicant must submit an explicit waiver request in the Full Application. The “Waiver Requests: Foreign Entity Participation as the Prime Recipient and

Performance of Work in the United States" Appendix B lists the information that must be included in a waiver request.

ii. Foreign Work Waiver Request

As set forth in Section IV, "Application and Submission Information; Performance of Work in the United States (Foreign Work Waiver), all work for projects selected under this FOA must be performed in the United States. To request a waiver of this requirement, the applicant must submit an explicit waiver request in the Full Application. The "Waiver Requests: Foreign Entity Participation and Performance of Work in the United States Appendix B lists the information that must be included in a foreign work waiver request.

Save the Waivers in a single PDF file using the following naming convention for the title "FN_Waiver.pdf" and click on "Add Optional Other Attachment" to attach.

xx. Data Management Plan

Applicants are required to submit a Data Management Plan as part of their Full Application. The Data Management Plan is a document that outlines the proposed plan for data generation, sharing, and/or preservation. Submission of this plan is required with the full application, and failure to submit the plan may result in rejection of the application without further consideration. Applicants shall prepare the DMP in the format provided in the "Data Management Plan" Appendix F of this FOA. Save this plan in a single file named "DMP.pdf" and click on "Add Optional Other Attachment" to attach. The submitted DMP may include the following:

- Details of the types, format, and size of data as well as software, curriculum content, and other types of information to be produced during the project.
- Details of the standards to be used for data and information format with adequate risk mitigation strategies
- Rigorous provisions for ethical data access, as well as preservation of privacy as well as protection of security and intellectual property
- Risk-informed provisions for data reuse and the production of data and information derivatives as well as archiving data, information and other relevant research products

xxi. Current and Pending Support (April 2023)

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. As part of the application, the principal investigator and all senior/key personnel at the applicant and subrecipient level 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. All connections with foreign government-sponsored talent recruitment programs must be identified in 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 and cost share. For pending proposals, provide the total amount of requested funding;
- The award period (start date through end date); and
- The person-months of effort per year being dedicated to the award or activity.

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

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. Supporting documents of any identified source of support must be provided to DOE on request, including certified translations of any document.

PIs and senior/key personnel must provide a separate disclosure statement listing the required information above regarding current and pending support. Each individual must sign and date their respective disclosure statement and include the following certification statement:

> *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 project period of performance of the award should circumstances change which impact the responses provided above.

The information may be provided in the approved common disclosure format available at Common Form for Current and Pending (Other) Support (nsf.gov).

The use of a format required by another agency is intended to reduce the administrative burden to researchers by promoting the use of common formats. If the NSF format is used, the individual must still include a signature, date, and a certification statement using the language included in the paragraph above.

Save this plan in a single file named "CPS.pdf" and click on "Add Optional Other Attachment" to attach.

Definitions:

Current and pending support – (a) All resources made available, or expected to be made available, to an individual in support of the individual's RD&D efforts, regardless of (i) whether the source is foreign or domestic; (ii) whether the resource is made available through the entity applying for an award or directly to the individual; or (iii) whether the resource has monetary value; and (b) includes in-kind contributions requiring a commitment of time and directly supporting the individual's RD&D efforts, such as the provision of office or laboratory space, equipment, supplies, employees, or students. This term has the same meaning as the term Other Support as applied to researchers in NSPM-33: For researchers, Other Support includes all resources made available to a researcher in support of and/or related to all of their professional RD&D efforts, including resources provided directly to the individual or through the organization, and regardless of whether or not they have monetary value (e.g., even if the support received is only in-kind, such as office/laboratory space, equipment, supplies, or employees). This includes resource and/or financial support from all foreign and domestic entities, including but not limited to, gifts provided with terms or conditions, financial support for laboratory personnel, and participation of student and visiting researchers supported by other sources of funding.

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 United States 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.

Senior/Key Personnel – An individual who contributes in a substantive, meaningful way to the scientific development or execution of a research, development and demonstration (RD&D) project proposed to be carried out with DOE award.[2]

xxii. U.S. Competitiveness

A primary objective of DOE's multibillion-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 the following U.S. Competitiveness Provision as part of an award under this FOA.

U.S. Competitiveness
The Recipient agrees that any products embodying any subject invention or produced through the use of 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. In the event DOE agrees to foreign manufacture, there will be a requirement that the Government's support of the technology be recognized in some appropriate manner, e.g., alternative binding commitments to provide an overall net benefit to the U.S. economy. The Recipient agrees that it will not license, assign or otherwise

[2] 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, graduate students, and those with a postdoctoral role also may be considered senior/key personnel if they meet this definition.

transfer any subject invention to any entity, at any tier, unless that entity agrees to these same requirements. Should the Recipient or other such entity receiving rights in the invention(s): (1) undergo a change in ownership amounting to a controlling interest, or (2) sell, assign, or otherwise transfer title or exclusive rights in the invention(s), then the assignment, license, or other transfer of rights in the subject invention(s) is/are suspended until approved in writing by DOE. The Recipient and any successor assignee will convey to DOE, upon written request from DOE, title to any subject invention, upon a breach of this paragraph. The Recipient will include this paragraph in all subawards/contracts, regardless of tier, for experimental, developmental or research work.

Please note that a subject invention is any invention conceived or first actually reduced to practice in performance of work under an award. An invention is any invention or discovery which is or may be patentable. The recipient shall ensure that these requirements also apply to subrecipients.

As noted in the U.S. Competitiveness Provision, if any 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. If not granted, the requesting entity must continue to perform according to the existing terms and conditions. More information and guidance on the waiver and modification request process can be found in the DOE Financial Assistance Letter on this topic.

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, “Other Information; Intellectual Property Developed Under This Program” of this FOA for more information on the DEC and DOE Patent Waiver.

xxiii. Transparency of Foreign Connections

Applicants must provide the following as it relates to the proposed recipient and subrecipients. Include a separate disclosure for the applicant and each proposed subrecipient. U.S. National Laboratories, domestic government entities, and institutions of higher education are only required to respond to items 1, 2 and 9, and if applying as to serve as the prime recipient, must provide complete responses for project team members that are not U.S. National Laboratories, domestic government entities, or institutions of higher education.

1. Entity name, website address, and mailing address;
2. The identity of all owners, principal investigators, project managers, and senior/key personnel who are a party to any *Foreign Government-Sponsored Talent Recruitment Program* of a foreign country of risk (i.e., China, Iran, North Korea, and Russia);
3. The existence of any joint venture or subsidiary that is based in, funded by, or has a foreign affiliation with any foreign country of risk;
4. Any current or pending contractual or financial obligation or other agreement specific to a business arrangement, or joint venture-like arrangement with an enterprise owned by a foreign state or any foreign entity;
5. Percentage, if any, that the proposed recipient or subrecipient has foreign ownership or control;
6. Percentage, if any, that the proposed recipient or subrecipient is wholly or partially owned by an entity in a foreign country of risk;
7. Percentage, if any, of venture capital or institutional investment by an entity that has a general partner or individual holding a leadership role in such entity who has a foreign affiliation with any foreign country of risk;
8. Any technology licensing or intellectual property sales to a foreign country of risk, during the 5-year period preceding submission of the proposal;
9. Any foreign business entity, offshore entity, or entity outside the United States related to the proposed recipient or subrecipient;
10. Complete list of all directors (and board observers), including their full name, citizenship and shareholder affiliation, date of appointment, duration of term, as well as a description of observer rights as applicable;
11. Complete capitalization table for your entity, including all equity interests (including LLC and partnership interests, as well as derivative securities). Include both the number of shares issued to each equity holder, as well as the percentage of that series and all equity on a fully diluted basis. Identify the principal place of incorporation (or organization) for each equity holder. If the equity holder is a natural person, identify the citizenship(s). If the recipient or subrecipient is a publicly traded company, provide the above information for shareholders with an interest greater than 5%;

12. A summary table identifying all rounds of financing, the purchase dates, the investors for each round, and all the associated governance and information rights obtained by investors during each round of financing; and
13. An organization chart to illustrate the relationship between your entity and the immediate parent, ultimate parent, and any intermediate parent, as well as any subsidiary or affiliates. Identify where each entity is incorporated.

DOE reserves the right to request additional or clarifying information based on the information submitted.

Save this plan in a single file named "BusinessSensitive.pdf" and click on "Add Optional Other Attachment" to attach.

xxiv. Potentially Duplicative Funding Notice

If the applicant or project team member has other active awards of federal funds, the applicant must determine whether the activities of those awards potentially overlap with the activities set forth in its application to this FOA. If there is a potential overlap, the applicant must notify DOE in writing of the potential overlap and state how it will ensure any project funds (i.e., recipient cost share and federal funds) will not be used for identical cost items under multiple awards. Likewise, for projects that receive funding under this FOA, if a recipient or project team member receives any other award of federal funds for activities that potentially overlap with the activities funded under the DOE award, the recipient must promptly notify DOE in writing of the potential overlap and state whether project funds from any of those other federal awards have been, are being, or are to be used (in whole or in part) for one or more of the identical cost items under the DOE award. If there are identical cost items, the recipient must promptly notify the DOE Contracting Officer in writing of the potential duplication and eliminate any inappropriate duplication of funding.

Save this plan in a single file named "PDFN.pdf" and click on "Add Optional Other Attachment" to attach.

I. Post Selection Information Requests (April 2023)

If selected for award negotiations, DOE reserves the right to require that selected applicants provide additional or clarifying information regarding the application submissions, the project, the project team, the award requirements, and any other matters related to anticipated award. The following is a non-exhaustive list of examples of information that may be required:

- Personnel proposed to work on the project and collaborating organizations (See Section VI, "Award Administration Information; Participants and Collaborating Organizations");
- Current and Pending Support (See Section VI, "Award Administration Information; Current and Pending Support");
- 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);
- Listing of Protected Data and Unlimited Rights Data, if applicable;
- Representation of Limited Rights Data and Restricted Software, if applicable;
- Updated Commitment Letters from Third Parties Contributing to Cost Share, if applicable;
- Updated Environmental Questionnaire, if applicable;
- Foreign National Participation;
- Information for the DOE Office of Civil Rights to process assurance reviews under 10 CFR 1040.

J. Submission Dates and Times

Concept Papers and Full Applications
Concept Papers and Full Applications must be received no later than the time/dates provided on the cover page of this FOA. **CONCEPT PAPERS AND/OR APPLICATIONS RECEIVED AFTER THE DEADLINE WILL NOT BE REVIEWED OR CONSIDERED FOR AWARD.**

K. Intergovernmental Review

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

L. Other Submission and Registration Requirements

i. Registration Process

There are several one-time actions before submitting an application in response to this FOA, and it is vital that applicants address these items as soon as possible. Some may take several weeks, and failure to complete them could interfere with an applicant's ability to apply to this FOA, or to meet the negotiation deadlines and receive an award if the application is

selected. These requirements are provided immediately following the FOA cover page or modification summary, if applicable.

ii. Where to Submit

Concept Papers must be submitted via e-mail to ConceptPapersFOA3127@netl.doe.gov.

Full Application Submission
You cannot submit an application through Grants.gov unless you are registered. Please read the registration requirements carefully and start the process immediately. **Applications submitted via e-mail will not be accepted.**

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

Below is an overview of submitting an application using Workspace on Grants.gov. For access to complete instructions on how to apply for opportunities using Workspace, refer to: https://www.grants.gov/web/grants/applicants/workspace-overview.html

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. 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/web/grants/applicants/adobe-software-compatibility.html

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:* The forms are designed to fill in common required fields across other forms, such as theapplicant name, address, and 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 Submission:* After successfully submitting a workspace application, a Grants.gov Tracking Number (GRANTXXXXXXXX) is automatically assigned to the application. The number will be listed on the Confirmation page that is generated after submission. Using the tracking number, access the Track My Application page under the Applicants tab or the Details tab in the submitted workspace.

For additional training resources, including video tutorials, refer to: https://www.grants.gov/web/grants/applicants/applicant-training.html
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.
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 the DOE with tracking your issue and understanding background information on the issue.

iii. Full Application Proof of Timely Submissions

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 with the AOR role who submitted the application will receive an acknowledgement of receipt and a tracking number (GRANTXXXXXXXX) from Grants.gov with the successful transmission of their application. The applicant with the AOR role will also receive the official date/time stamp and Grants.gov Tracking number in an email

serving as proof of their timely submission. The Grants.gov Support Center reports that some applicants end the transmission because they think that nothing is occurring during the transmission process. Please be patient and give the system time to process the application.

When DOE 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 who submitted the application. 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 FOA will be considered non-compliant.

iv. Electronic Authorization of Applications and Award Documents

Submission of an application and supplemental information under this FOA through electronic systems used by the DOE, including Grants.gov and FedConnect.net, constitutes the authorized representative's approval and electronic signature.

M. Funding Restrictions (April 2023)

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.

Costs must be allowable, allocable and reasonable in accordance with the applicable federal cost principles referenced in 2 CFR part 200 as amended by 2 CFR part 910. Pursuant to 2 CFR 910.352, the cost principles in the Federal Acquisition Regulations (48 CFR 31.2) apply to for-profit entities. The cost principles contained in 2 CFR Part 200, Subpart E apply to all entities other than for-profits.

N. Pre-Award Costs

Recipients may charge to an award resulting from this announcement pre-award costs that were incurred within the ninety (90) calendar day period immediately preceding the effective date of the award, if the costs are allowable in accordance with the applicable Federal cost principles referenced in 2 CFR part 200 as amended by 2 CFR part 910 [DOE Financial Assistance Regulation]. Recipients must obtain the prior approval of the contracting officer for any pre-award costs that are for periods greater than this 90-day calendar period.

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

O. Pre-Award Costs Related to National Environmental Policy Act (NEPA) Requirements

DOE's decision whether and how to distribute Federal funds under this FOA is subject to NEPA. Applicants should carefully consider and should seek legal counsel or other expert advice before taking any action related to the proposed project that would have an adverse effect on the environment or limit the choice of reasonable alternatives prior to DOE completing the NEPA review process.

DOE does not guarantee or assume any obligation to reimburse pre-award costs incurred prior to receiving written authorization from the Contracting Officer. If the applicant elects to undertake activities that DOE determines may have an adverse effect on the environment or limit the choice of reasonable alternatives prior to receiving such written authorization from the Contracting Officer, the applicant is doing so at risk of not receiving Federal funding for the project and such costs may not be recognized as allowable cost share. Nothing contained in the pre-award cost reimbursement regulations or any pre-award costs approval letter from the Contracting Officer override these NEPA requirements to obtain the written authorization from the Contracting Officer prior to taking any action that may have an adverse effect on the environment or limit the choice of reasonable alternatives. Likewise, if a project is selected for negotiation of award, and the Prime Recipient elects to undertake activities that are not authorized for Federal funding by the Contracting Officer in advance of DOE completing a NEPA review, the Prime Recipient is doing so at risk of not receiving Federal Funding and such costs may not be recognized as allowable cost share.

P. Performance of Work in the United States (Foreign Work Waiver) (April 2023)

i. Requirement

All work performed under DOE awards issued under this FOA must be performed in the United States. The prime recipient must flow down this requirement to its subrecipients.

ii. Failure to Comply

If the prime recipient fails to comply with the Performance of Work in the United States requirement, DOE may deny reimbursement for the work conducted outside the United States and such costs may not be recognized as allowable recipient cost share. The prime recipient is responsible should any work under this award be performed outside the United States, absent a waiver, regardless of whether the work is performed by the prime recipient, subrecipients, contractors or other project partners.

iii. Waiver

To seek a foreign work waiver, the applicant must submit a written waiver request to DOE. The "Waiver Requests: Foreign Entity Participation and Performance of Work in the United States" Appendix B lists the information that must be included in a request for a foreign work waiver.

It is noted that direct labor associated with foreign travel to attend or present at a scientific/technical conference or consortium that has been approved by DOE does not require a waiver.

Q. Foreign Travel

Foreign travel and associated costs are not allowable under this FOA.

R. Equipment and Supplies

Property disposition may be required at the end of a project if the current fair market value of property exceeds $5,000. For-profit entity disposition requirements are set forth at 2 CFR 910.360. Property disposition requirements for other non-Federal entities are set forth in 2 CFR 200.310 – 200.316.

However, pursuant to the FY23 Consolidated Appropriations Act (Pub. L. No. 117-328), Division D, Title III, Section 309, the Secretary, or a designee of the Secretary may, at their discretion, vest unconditional title or other property interests acquired under this project regardless of the fair market value of the property at the end of the award period.

S. Buy America Requirements for Infrastructure Projects (April 2023)

Pursuant to the Build America Buy America Act, subtitle IX of the Infrastructure Investment and Jobs Act[3], more commonly known as the Bipartisan Infrastructure Law (BIL) (Buy America, or "BABA"), Federally assisted projects that involve infrastructure work, undertaken by applicable recipient types, require that:

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

Whether a given project must apply this requirement is project-specific and dependent on several factors, such as the recipient's entity type, whether the work involves "infrastructure," as that term is defined in Section 70914 of the Bipartisan Infrastructure Law, and whether the infrastructure in question is publicly owned or serves a public function.

Applicants are strongly encouraged to consult the "Required Use of American Iron, Steel, Manufactured Products, and Construction Materials-Buy America Requirement for Infrastructure Projects" Appendix C of this FOA to determine whether their project may have to apply this requirement, both to make an early determination as to the need of a waiver, as well as to determine what impact, if any, this requirement may have on the proposed project's budget.

Please note that, based on the implementation guidance from the Office of Management and Budget (OMB) issued on April 18, 2022, the Buy America requirements of the BIL do not apply to DOE projects in which the prime recipient is a for-profit entity; the requirements only apply to projects whose prime recipient is a "non-Federal entity," e.g., a State, local government, Indian tribe, Institution of Higher Education, or nonprofit organization. Subawards should conform to the terms of the prime award from which they flow; in other words, for-profit prime recipients are not required to flow down these Buy America requirements to subrecipients, even if those subrecipients are non-Federal entities as defined above. Conversely, prime recipients which are non-Federal entities must flow the Buy America requirements down to all subrecipients, even if those subrecipients are for-profit entities. Finally, for all applicants—both non-Federal entities and for-profit entities—DOE is including a Program Policy Factor that the Selection Official may consider in determining which Full Applications to select for award negotiations that considers whether the applicant has made a commitment to procure U.S. iron, steel, manufactured products, and construction materials in its project.

[3] Infrastructure Investment and Jobs Act, Public Law 117-58 (November 15, 2021). https://www.congress.gov/bill/117th-congress/house-bill/3684.

The DOE financial assistance agreement will require each recipient: (1) to fulfill the commitments made in its application regarding the procurement of U.S.-produced products and (2) to fulfill the commitments made in its application regarding the procurement of other key component metals and manufactured products domestically that are deemed available in sufficient and reasonably available quantities or of a satisfactory quality at the time of award negotiation. Applicants may seek waivers of these requirements in very limited circumstances and for good cause shown. Further details on requesting a waiver can be found in The "Required Use of American Iron, Steel, Manufactured Products, and Construction Materials – Buy America Requirements for Infrastructure Projects" Appendix C and the terms and conditions of an award

Applicants are strongly encouraged to consult the "Required Use of American Iron, Steel, Manufactured Products, and Construction Materials – Buy America Requirements for Infrastructure Projects" Appendix C for more information.

V. Application Review Information

A. Review Criteria

i. Compliance/Responsiveness Review

Prior to a comprehensive merit evaluation, DOE will (1) perform a compliance review to determine that submissions are timely and the information required by the FOA has been submitted (form and content requirements); and (2) perform a responsiveness review to determine that the Applicant is eligible for an award and the proposed project is responsive to the objectives of the FOA. Applications that fail the compliance and responsiveness review will not be forwarded for merit review and will be eliminated from further consideration.

ii. Concept Paper Review

Concept Papers are evaluated based on consideration the following factors. All sub-criteria are of equal weight.

Concept Paper Criterion: Overall FOA Responsiveness and Viability of the Project (Weight: 100%)

- The proposed work, if successfully accomplished, would clearly meet the objectives as stated in the FOA.
- The applicant clearly describes the proposed technology, describes how the technology is unique and innovative, and how the technology will advance the current state-of-the-art;
- The applicant has identified risks and challenges, including possible mitigation strategies, and has shown the impact that DOE funding and the proposed project would have on the relevant field and application;
- The proposed project makes use of existing industry standards, best practices and/or platforms that address interoperability and scalability of the technology; and
- The applicant has the qualifications, experience, capabilities and other resources necessary to complete the proposed project.

iii. Full Application Merit Review Criteria

The following evaluation criteria will be utilized by the Technical Evaluation Committee and Federal Merit Review Panel members in conducting their evaluations of applications subjected to comprehensive merit review.

CRITERION 1: TECHNICAL MERIT AND INNOVATION (40%)

This criterion will evaluate the technical merit and feasibility of the proposed concept/project as detailed in the application. This criterion will also be used to gauge the degree of innovation of the proposed solution in comparison to contemporary technology, along with the effectiveness of the proposal in addressing the technical requirements specified in the FOA.

1. Level of the Applicant's/project team's understanding of the state of existing and emerging technology as indicated by the degree of clarity and thoroughness articulated in the description of the proposed solution/approach.
2. Extent to which the proposed technical concept/project is innovative compared to previous and ongoing work, and existing and emerging approaches and technologies.
3. Extent to which the project leverages related industry standards, best practices, platforms, and frameworks that address interoperability and scalability of the technology.
4. Extent to which the application clearly and convincingly demonstrates how the proposed technical concept/project will advance the relevant technology beyond the current level of development.
5. Validity/viability of the proposed technical concept/project as evidenced by peer reviewed or collaborated data, and/or results of previous and ongoing work.
6. Degree to which the proposed technical concept/project addresses the key objectives outlined in the FOA.
7. Adequacy of the technology development strategy to move the technology solution and/or methodology to the next logical stage of RD&D.
8. Level of clarity and rigor in any description of data analytics methods such as specificity and justification of artificial intelligence/machine learning approaches proposed in the project.
9. The proposed project field demonstration aligns with the corresponding area of interest requirements outlined in "Area of Interest."

CRITERION 2: SIGNIFICANCE AND IMPACT (25%)

This criterion will evaluate the significance of implementation of the proposed technical concept/project; and the resultant impact to operational efficiency, safety, resiliency and reliability of electricity delivery systems and the overall energy sector in a cost-effective manner.

1. Extent to which the proposed technical concept/project outcomes meets or exceeds the goals or performance targets specified in the FOA.
2. Degree to which the application clearly and convincingly describes/explains the cost-effectiveness and/or performance improvement of the proposed technical concept/project over existing and emerging approaches and technologies.
3. Magnitude of the cost-effectiveness and/or performance improvement of the proposed technical concept/project over existing and emerging approaches and technologies.
4. Degree to which the application clearly and convincingly conveys the potential for broad adoption and sustainable use of the proposed technical concept/project.
5. Extent of the expected adoption, commercialization, and/or technology transfer of the proposed technical concept/project.
6. Extent to which the proposed approach fosters collaboration and would lead to dissemination of data, results, and lessons learned to relevant entities not immediately involved with the project.
7. Extent to which the proposed technology could address historical energy justice concerns.

CRITERION 3: PROJECT EXECUTION AND MANAGEMENT APPROACH (20%)

This criterion will evaluate the level of the Applicant's management skills and the adequacy, appropriateness, and reasonableness of the proposed management strategy to achieve the stated goals and objectives of both the FOA and the proposed technical concept/project as articulated through the Project Management Plan (PMP) and Statement of Project Objectives (SOPO).

1. Level of the Applicant's project management skills and thoroughness of the PMP as demonstrated by the use of sound project management principles to clearly define the roles and responsibilities of the project team, an appropriate schedule of tasks, with associated interdependencies, milestones, and the use of sound risk mitigation strategies and plans. At a minimum, the PMP must address the following elements:
   - Executive Summary/Technical Approach – clarity and conciseness of the project description which, at a minimum, must discuss the objectives, goals, expected results, and technical approach.
   - Key Personnel – appropriate utilization of the project team's key personnel; including the principal investigator (PI), business point of contact, and any other individuals having significant tasks or responsibilities in the execution of the project.
   - Funding and Costing Profile – adequacy of detail (including a Budget Table and Quarterly Spending Plan) in describing how the Applicant will manage and monitor the execution of the project budget.
   - Milestone Log – extent to which each milestone in the Milestone Log is appropriate, specific, measurable, achievable, relevant, timely, verifiable, and

shows progress toward achievement of project goals. At a minimum, each milestone must include a description, planned completion date, and verification method.

- Project Schedule – adequacy and relevance of interdependencies between tasks. The schedule must clearly indicate milestones identified in the Milestone Log and include a proposed project timeline broken down by phase and task (as identified in the SOPO) with team members and their roles. The schedule must also indicate the deliverables identified in the Project Deliverables Log, which must include each deliverable's title, associated phase/task, and planned completion date.
- Risk Management – extent to which the application identifies and defines the potential risks that may impact project success and the adequacy of the proposed approach to continue to assess and address risks throughout the project.

2. Degree to which the SOPO provides a sufficiently detailed, concise, and understandable description of the tasks, subtasks, and deliverables by which the overall project scope will be performed, and the project objectives will be achieved. At a minimum, the SOPO must address the following:
   - Objectives – extent to which the overall objectives of the project, and the objective for each phase of work (if applicable), are clearly described.
   - Scope of Project – appropriateness of the focus and effort to achieve the objectives of the proposed technical concept/project.
   - Tasks (and Subtasks) to be Performed – extent to which tasks (and subtasks) are clearly defined and organized in a logical sequence that increases the likelihood of achieving the objectives of the proposed technical concept/project. As warranted, go/no-go decision point(s) are to be included that demonstrate meaningful and measurable technical progress and provide justification for the continuance of the proposed technical concept/project.
   - Technical Deliverables – appropriateness of proposed deliverables (beyond those required by this FOA) and their relevance to the corresponding task.
   - Briefings/Technical Presentations – appropriateness of the Applicant's planned briefing(s) and/or technical presentation(s).

CRITERION 4: TEAM AND RESOURCES (15%)

This criterion will evaluate the likelihood that the project team, facilities, and other resources are appropriate and sufficient to achieve the project's proposed goals and objectives.

1. Adequacy and appropriateness of the qualifications, expertise, and experience of key personnel and team members.
2. Availability of key personnel.

3. (As applicable) The appropriateness, and quality of past peer reviewed publications of key personnel and team members demonstrate the team's technical expertise and past results.
4. Degree of demonstrated experience and past collaboration of the project team in completing comparable efforts that yielded successful technology development and deployment (as applicable).
5. Level of dedication of the project team as demonstrated by letters of commitment that clearly identify each participant's role, contribution, and amount of proposed cost share.
6. Availability, appropriateness, adequacy, and condition of facilities and equipment.
7. Availability, appropriateness, and adequacy of utility data sources and sensors made available to the project.

B. Other Selection Factors

i. Program Policy Factors

In addition to the above criteria, the Selection Official may consider the following program policy factors in determining which Full Applications to select for award negotiations:

- It may be desirable to select for award a project, or group of projects, that represent a diversity of technical approaches and methods under this FOA or the overall program.
- It may be desirable to support complementary and/or similar projects which, when taken together, will best achieve the program's research goals and objectives.
- It may be desirable that different kinds and sizes of organizations be selected for award in order to provide a balanced programmatic effort and a variety of technical perspectives under this FOA or the overall program.
- In order to best achieve the program's research goals and objectives, it may be desirable to select for award a project or group of projects with a broad or specific geographic distribution under this FOA or the overall program.
- It may be desirable to select a project, or group of projects, if such a selection will optimize use of available funds.
- It may be desirable to select a project, or group of projects, if such a selection presents lesser schedule risk, lesser budget risk, lesser technical risk, and/or lesser environmental risks. Environmental risk includes, but is not limited to, an adverse impact to air, soil, water, or increase in overall

cradle to grave greenhouse gas footprint (carbon dioxide equivalent, CO2e).

- DOE is including a Program Policy Factor that the Selection Official may consider in determining which Full Applications to select for award negotiations that considers whether the applicant has made a commitment to procure U.S. iron, steel, manufactured products, and construction materials in its project.

C. Other Review Requirements

i. Risk Assessment (May 2023)

Pursuant to 2 CFR 200.206, DOE will conduct an additional review of the risk posed by applications submitted under this FOA. Such risk assessment will consider:

- Financial stability;
- Quality of management systems and ability to meet the management standards prescribed in 2 CFR 200 as amended by 2 CFR 910;
- History of performance;
- Audit reports and findings; and
- The applicant's ability to effectively implement statutory, regulatory, or other requirements imposed on non-Federal entities.

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

Depending on the severity of the findings and whether the findings were resolved, DOE may elect not to fund the applicant.

In addition to this review, DOE must comply with the guidelines on government-wide suspension and debarment in 2 CFR 180, and must require non-Federal entities to comply with these provisions. These provisions restrict Federal awards, subawards and contracts with certain parties that are debarred, suspended or otherwise excluded from or ineligible for participation in Federal programs or activities.

Further, as DOE invests in critical infrastructure and funds critical and emerging technology areas, DOE also considers threats to United States research, technology, and economic security from undue foreign government influence when evaluating risk. If high risks are identified and cannot be sufficiently mitigated, DOE may elect to not fund the applicant.

ii. Recipient Responsibility and Qualifications (May 2023)

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 responsibility and qualification information about the applicant that is in entity information domain in SAM.gov (see 41 U.S.C. 2313).

The applicant, at its option, may review information in the entity information domain in SAM.gov and comment on any information about itself that a federal awarding agency previously entered and is currently in the entity information domain in SAM.gov.

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

D. Review and Selection Process

i. Merit Review

Applications that pass the compliance/responsiveness review will be subjected to a merit review in accordance with the Merit Review Criteria listed in the FOA and the guidance provided in the "Merit Review Guide for Financial Assistance and Unsolicited Proposals." This guide is available at https://energy.gov/management/financial-assistance.

ii. Selection

The Selection Official may consider the merit review, program policy factors, and the amount of funds available in arriving at selections for this FOA.

iii. Discussions and Award

The Government may enter into discussions with a selected applicant for any reason deemed necessary, including but not limited to: (1) the budget is not appropriate or reasonable for the requirement; (2) only a portion of the application is selected for award; (3) the Government needs additional information to determine that the recipient is capable of complying with the requirements in 2 CFR part 200 as amended by 2 CFR part 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.

VI. Award Administration Information

A. Notices

i. Ineligible Submissions

Ineligible Concept Papers and Full Applications will not be further reviewed or considered for award. The Contracting Officer will send a notification letter by email to the technical and administrative points of contact designated by the applicant. The applicant points of contact are designated as follows:

Concept Papers: on the Concept Paper cover page
Full Applications: in Grants.gov

The notification will state the basis upon which the Concept Paper and/or Full Application is ineligible and not considered for further review.

ii. Concept Paper Notifications

DOE will notify applicants of its determination to encourage or discourage the submission of a Full Application. DOE will send a notification letter by email to the technical and administrative points of contact designated by the applicant in on the Concept Paper cover page.

Applicants may submit a Full Application even if they receive a notification discouraging them from doing so. By discouraging the submission of a Full Application, DOE intends to convey its lack of programmatic interest in the proposed project. Such assessments do not necessarily reflect judgments on the merits of the proposed project. The purpose of the Concept Paper phase is to save applicants the considerable time and expense of preparing a Full Application that is unlikely to be selected for award negotiations.

A notification letter encouraging the submission of a Full Application does not authorize the applicant to commence performance of the project. Please refer to Section IV, “Application and Submission Information; Pre-Award Costs” of the FOA for guidance on Pre-Award costs.

DOE anticipates completing Concept Paper reviews by the specified date on the FOA cover page and providing notifications by email immediately following.

iii. Full Application Notifications

DOE will notify applicants of its determination via a notification letter by email to the technical and administrative points of contact designated by the applicant in Grants.gov. The notification letter will inform the applicant whether or not its Full Application was selected for award negotiations. Alternatively, DOE may notify one or more applicants that a final selection determination on particular Full Applications will be made at a later date, subject to the availability of funds or other factors.

(a) Successful Applicants

Receipt of a notification letter selecting a Full Application for award negotiations does not authorize the applicant to commence performance of the project. If an application is selected for award negotiations, it is not a commitment by DOE to issue an award. Applicants do not receive an award until award negotiations are complete and the Contracting Officer executes the funding agreement, accessible by the Prime Recipient in FedConnect.

The award negotiation process may take up to 60 days. Applicants must designate a primary and a backup point-of-contact in Grants.gov with whom DOE will communicate to conduct award negotiations. The applicant must be responsive during award negotiations (i.e., provide requested documentation) and meet the negotiation deadlines. If the applicant fails to do so or if award negotiations are otherwise unsuccessful, DOE will cancel the award negotiations and rescind the Selection. DOE reserves the right to terminate award negotiations at any time for any reason.

Please refer to Section IV, “Application and Submission Information; Pre-Award Costs” of the FOA for guidance on pre-award costs.

(b) Unsuccessful Applicants

DOE shall promptly notify in writing each applicant whose application has not been selected for negotiation or award. This notice will explain why the application was not selected.

(c) Alternate Selection Determinations

In some instances, an applicant may receive a notification that its application was not selected for award and DOE designated the application to be an alternate. As an alternate, DOE may consider the Full

Application for Federal funding in the future. A notification letter stating the Full Application is designated as an alternate does not authorize the applicant to commence performance of the project. DOE may ultimately determine to select or not select the Full Application for award negotiations.

(d) Notice of Award

An Assistance Agreement issued by the Contracting Officer is the authorizing award document. It normally includes either as an attachment or by reference: (1) Special Terms and Conditions; (2) Applicable program regulations, if any; (3) Application, which includes the project description and budget, as approved by DOE; (4) 2 CFR part 200 as amended by 2 CFR part 910; (5) National Policy Assurances To Be Incorporated As Award Terms; (6) Budget Summary; (7) Federal Assistance Reporting Checklist and Instructions, which identifies the reporting requirements; (8) Intellectual Property; (9) Federal-wide Research Terms and Conditions; (10) Agency Specific Requirements; and (11) any award specific terms and conditions.

B. Administrative and National Policy Requirements

iv. Award Administrative Requirements

The administrative requirements for DOE grants and cooperative agreements are contained in 2 CFR Part 200 as amended by 2 CFR Part 910.

DOE Special Terms and Conditions for Use in Most Grants and Cooperative Agreements. The DOE Special Terms and Conditions for Use in Most Grants and Cooperative Agreements are located at https://www.energy.gov/management/financial-assistance-forms-and-information-applicants-and-recipients under Award Terms.

National Policy Requirements. The National Policy Assurances that are incorporated as a term and condition of award are located at: https://www.energy.gov/management/financial-assistance-forms-and-information-applicants-and-recipients.

Intellectual Property Provisions. The standard DOE financial assistance intellectual property provisions applicable to the various types of recipients are located at: https://energy.gov/gc/standard-intellectual-property-ip-provisions-financial-assistance-awards.

v. Unique Entity Identifier Requirements and System for Award Management (April 2023)

Each applicant (unless the applicant is an individual or federal awarding agency that is excepted from those requirements under 2 CFR 25.110(b) or (c), or has an exception approved by the federal awarding agency under 2 CFR 25.110(d)) is required to: (1) Be registered in the SAM at https://www.sam.gov before submitting its application; (2) provide a valid UEI number in its application; and (3) continue to maintain an active SAM registration with current information at all times during which it has an active federal award or an application or plan under consideration by a federal awarding agency. DOE may not make a federal award to an applicant until the applicant has complied with all applicable UEI and SAM requirements and, if an applicant has not fully complied with the requirements by the time DOE is ready to make a federal award, the DOE will determine that the applicant is not qualified to receive a federal award and use that determination as a basis for making a federal award to another applicant.

NOTE: Due to the high demand of UEI requests and SAM registrations, entity legal business name and address validations are taking longer than expected to process. Entities should start the UEI and SAM registration process as soon as possible. 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. Additional entity validation resources can be found here: GSAFSD Tier 0 Knowledge Base - Validating your Entity**.**

vi. Uniform Commercial Code (UCC) Financing Statements

Per 2 CFR 910.360 (Real Property and Equipment) when a piece of equipment is purchased by a for-profit recipient or subrecipient with Federal Funds (federal and/or non-federal), and when the Federal share of the financial assistance agreement is more than $1,000,000, the recipient or subrecipient must:

Properly record, and consent to the Department's ability to properly record if the recipient fails to do so, Uniform Commercial Code (UCC) financing statement(s) for all equipment in excess of $5,000 purchased with project funds. These financing statement(s) must be approved in writing by the contracting officer prior to the recording, and they shall provide notice that the Recipient's title to all equipment (not real property) purchased with

Federal funds under the financial assistance agreement is conditional pursuant to the terms of this section, and that the Government retains an undivided reversionary interest in the equipment. The UCC financing statement(s) must be filed before the Contracting Officer may reimburse the recipient for the Federal share of the equipment unless otherwise provided for in the relevant financial assistance agreement. The recipient shall further make any amendments to the financing statements or additional recordings, including appropriate continuation statements, as necessary or as the contracting officer may direct.

Note: All costs associated with filing UCC financing statements, UCC financing statement amendments, and UCC financing statement terminations, are allowable and allocable costs to be charged to the Federal award.

vii. Foreign National Participation (April 2023)

All applicants selected for an award under this FOA and project participants (including subrecipients and contractors) who anticipate involving foreign nationals in the performance of an award, will be required to provide DOE with specific information about each foreign national to satisfy requirements for foreign national participation and access approvals. The volume and type of information collected may depend on various factors associated with the award. DOE concurrence may be required before a foreign national can participate in the performance of any work under an award.

Approval for foreign nationals in Principal Investigator/Co-Investigator roles, from countries or risk (i.e., China, Iran, North Korea and Russia), or from countries identified on the U.S. Department of State's list of State Sponsors of Terrorism (https://www.state.gov/state-sponsors-of-terrorism/) may require written authorization from DOE before they can participate in the performance of any work under an award.

A "foreign national" is defined as any person who is not a United States citizen by birth or naturalization. DOE may elect to deny a foreign national's participation in the award. Likewise, DOE may elect to deny a foreign national's access to DOE sites, information, technologies, equipment, programs, or personnel.

Applicants selected for award negotiations must include this requirement in subawards.

viii. Export Control Responsibilities (April 2023)

The United States government regulates the transfer of information, commodities, technology, and software considered to be strategically important to the United States to protect national security, foreign policy, and economic interest without imposing undue regulatory burdens on legitimate international trade. There is a network of federal agencies and regulations that govern exports that are collectively referred to as "Export Controls". All recipients and subrecipients are responsible for ensuring compliance with all applicable United States Export Control laws and regulations relating to any work performed under a resulting award.

The selected applicant must immediately report to DOE any export control violations related to the projected funding under the DOE award, at the prime or subrecipient level, and provide corrective action(s) to prevent future violations

ix. Statement of Federal Stewardship

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

x. Statement of Substantial Involvement

Cooperative agreements will be awarded under this announcement. There will be substantial involvement between the DOE and the Recipient during performance of this Cooperative Agreement.

Recipient's Responsibilities. The Recipient is responsible for:

- Performing the project activities supported by the award in accordance with the Statement of Project Objectives and Project Management Plan, including providing the required personnel, facilities, equipment, supplies and services.
- Managing and controlling project activities in accordance with its own established processes and procedures to ensure tasks and subtasks are

completed within schedule and budget constraints defined by the current Project Management Plan.

- Implementing an approach to identify, analyze, and respond to project risks that is commensurate with the complexity of the project.
- Defining and revising approaches and plans, submitting the plans to DOE for review, and incorporating DOE comments.
- Coordinating related project activities with team members and external stakeholders to ensure effective integration of all work elements.
- Attending periodic program review meetings and reporting project status.
- Submitting technical reports and addressing DOE comments.

Presenting the project results at appropriate technical conferences or meetings as directed by the DOE Project Officer (number of conferences/meetings shall be determined by the Project Officer).

DOE Responsibilities. DOE is responsible for:

- Reviewing project plans, including as required: project management, testing, cybersecurity, interoperability, data management, and technology transfer/commercialization plan in a timely manner then recommending alternate approaches if the plans do not address critical programmatic objectives.
- Participating in project management planning activities, including risk analysis, to ensure DOE program requirements or limitations are considered in performance of the SOPO tasks.
- Conducting periodic reviews to ensure adequate progress and that the work accomplishes the program and project objectives. Recommending alternate approaches or shifting work emphasis, if needed.
- Integrating, coordinating, and redirecting the work effort to ensure that project activities address programmatic goals established by the DOE OE, including coordination with other OE R&D Programs.
- Reviewing scientific/technical reports to ensure programmatic needs and the requirements of the Financial Assistance award instrument, including intellectual property rights, are satisfied and providing comments to the Recipient in a timely manner.
- Promoting and facilitating technology transfer activities, including disseminating program results through presentations and publications.
- Serving as scientific/technical liaison between recipients and other DOE programs.
- Participating in major project decision-making processes associated with:
- Establishing performance goals, metrics, and data requirements;
- Developing a strategy for dissemination of results and lessons learned;

- Preliminary plans, documents, designs, and/or functional specifications;
- Serving as the liaison between the Recipient and other agencies and organizations;
- Deciding on open source software strategy and distribution plans
- Determining testing and demonstration performance expectations and developing baseline metrics and performance goals prior to demonstrating developed technologies and systems

xi. Environmental Review in Accordance with National Environmental Policy Act (NEPA)

DOE's decision whether and how to distribute federal funds under this FOA is subject to the National Environmental Policy Act (42 USC 4321, *et seq.*). NEPA requires Federal agencies to integrate environmental values into their decision-making processes by considering the potential environmental impacts of their proposed actions. For additional background on NEPA, please see DOE's NEPA website, at http://nepa.energy.gov/.

While NEPA compliance is a Federal agency responsibility and the ultimate decisions remain with the Federal agency, all recipients selected for an award will be required to assist in the timely and effective completion of the NEPA process in the manner most pertinent to their proposed project. If DOE determines certain records must be prepared to complete the NEPA review process (e.g., biological evaluations or environmental assessments), the recipient may be required to prepare the records and the costs to prepare the necessary records may be included as part of the project costs.

xii. Conference Spending

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.

xiii. Indemnity

Awards resulting from this FOA will contain the following provision reminding Recipients of DOE's rights of indemnification.

The Recipient shall indemnify the Government and its officers, agents, or employees for any and all liability, including litigation expenses and attorneys' fees, arising from suits, actions, or claims of any character for death, bodily injury, or loss of or damage to property or to the environment, resulting from the project, except to the extent that such liability results from the direct fault or negligence of Government officers, agents or employees, or to the extent such liability may be covered by applicable allowable costs provisions.

xiv. Go/No-Go Review

Each project selected under this FOA will be subject to a periodic project evaluation referred to as a Go/No-Go Review. At the Go/No-Go decision points, DOE will evaluate project performance, project schedule adherence, meeting milestone objectives, compliance with reporting requirements, and overall contribution to the DOE program goals and objectives. Federal funding beyond the Go/No Go decision point (continuation funding), is contingent on (1) the availability of funds appropriated by Congress for the purpose of this program; (2) the availability of future-year budget authority; (3) recipient's technical progress compared to the Milestone Summary Table stated in Attachment 1 of the award; (4) recipient's submittal of required reports; (5) recipient's compliance with the terms and conditions of the award; (6) DOE's Go/No-Go decision; (7) the recipient's submission of a continuation application; and (8) written approval of the continuation application by the Contracting Officer.

As a result of the Go/No Go Review, DOE may, at its discretion, authorize the following actions: (1) continue to fund the project, contingent upon the availability of funds appropriated by Congress for the purpose of this program and the availability of future-year budget authority; (2) recommend redirection of work under the project; (3) place a hold on federal funding for the project, pending further supporting data or funding; or (4) discontinue funding the project because of insufficient progress, change in strategic direction, or lack of funding.

The Go/No-Go decision is distinct from a non-compliance determination. In the event a recipient fails to comply with the requirements of an award, DOE

may take appropriate action, including but not limited to, redirecting, suspending or terminating the award.

xv. Interim Conflict of Interest Policy for Financial Assistance

The DOE interim Conflict of Interest Policy for Financial Assistance (COI Policy)[4] 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. The term "Investigator" means the PI and any other person, regardless of title or position, who is responsible for the purpose, design, conduct, or reporting of a project funded by DOE or proposed for funding by DOE. Recipients must flow down the requirements of the interim COI Policy to any subrecipient non-Federal entities. Further, for DOE funded projects, the recipient must include all financial conflicts of interest (FCOI) (i.e., managed and unmanaged/ unmanageable) in their initial and ongoing FCOI reports.

It is understood that non-Federal entities and individuals receiving DOE financial assistance awards will need sufficient time to come into full compliance with DOE's interim COI Policy. To provide some flexibility, DOE allows for a staggered implementation. **Specifically, prior to award, applicants selected for award negotiations must: ensure all Investigators complete their significant financial disclosures; review the disclosures; determine whether a FCOI exists; develop and implement a management plan for FCOIs; and provide DOE with an initial FCOI report that includes all FCOIs (i.e., managed and unmanaged/ unmanageable).** Recipients will have 180 days from the date of the award to come into full compliance with the other requirements set forth in DOE's interim COI Policy. **Prior to award, the applicant must certify that it is, or will be within 180 days of the award, compliant with all requirements in the interim COI Policy.**

xvi. Participants and Collaborating Organizations

If selected for award negotiations, the selected applicant must submit a list of personnel who are proposed to work on the project, both at the recipient and subrecipient level and a list of proposed collaborating organizations within 30 days after the applicant is notified of the selection. Recipients will have an ongoing responsibility to notify DOE of changes to the personnel and

[4] DOE's interim COI Policy can be found at PF 2022-17 FAL 2022-02 Department of Energy Interim Conflict of Interest Policy Requirements for Financial Assistance.

collaborating organizations, and submit updated information during the life of the award.

xvii. Current and Pending Support

If selected for award negotiations, within 30 days of the selection notice, the selectee must submit 1) current and pending support disclosures and resumes for any new PIs or senior/key personnel and 2) updated disclosures if there have been any changes to the current and pending support submitted with the application. Throughout the life of the award, the Recipient has an ongoing responsibility to submit 1) current and pending support disclosure statements and resumes for any new PI and senior/key personnel and 2) updated disclosures if there are changes to the current and pending support previously submitted to DOE. Also See Section IV, "Application and Submission Information; Current and Pending Support".

xviii. Fraud, Waste and Abuse (April 2023)

The mission of the DOE Office of Inspector General (OIG) is to strengthen the integrity, economy and efficiency of the Department's programs and operations including deterring and detecting fraud, waste, abuse and mismanagement. The OIG accomplishes this mission primarily through investigations, audits, and inspections of DOE activities to include grants, cooperative agreements, loans, and contracts.

The OIG maintains a Hotline for reporting allegations of fraud, waste, abuse, or mismanagement. To report such allegations, please visit https://www.energy.gov/ig/ig-hotline.

Additionally, recipients of DOE awards must be cognizant of the requirements of 2 CFR § 200.113 Mandatory disclosures:

> The non-Federal entity or applicant for a Federal award must disclose, in a timely manner, in writing to the Federal awarding agency or pass-through entity all violations of Federal criminal law involving fraud, bribery, or gratuity violations potentially affecting the Federal award. Non-Federal entities that have received a Federal award including the term and condition outlined in appendix XII of 2 CFR Part 200 are required to report certain civil, criminal, or administrative proceedings to SAM. Failure to make required disclosures can result in any of the remedies described in § 200.339. (See also 2 CFR part 180, 31 U.S.C. 3321, and 41 U.S.C. 2313.) [85 FR 49539, Aug. 13, 2020]

Applicants and subrecipients (if applicable) are encouraged to allocate sufficient costs in the project budget to cover the costs associated for personnel and data infrastructure needs to support performance management and program evaluation needs including but not limited to independent program and project audits to mitigate risks for fraud, waste, and abuse.

xix. Human Subjects Research (April 2023)

Research involving human subjects, biospecimens, or identifiable private information conducted with DOE funding is subject to the requirements of DOE Order 443.1C, Protection of Human Research Subjects, 45 CFR Part 46, Protection of Human Subjects (subpart A which is referred to as the "Common Rule"), and 10 CFR Part 745, Protection of Human Subjects. Additional information on the DOE Human Subjects Research Program can be found at: https://science.osti.gov/ber/human-subjects.

xx. Flood Resilience (April 2023)

Applications should indicate whether the proposed project location(s) is within a floodplain, how the floodplain was defined, and how future flooding will factor into the project's design. The base floodplain long used for planning has been the 100-year floodplain, that is, a floodplain with a 1.0 % chance of flooding in any given year. As directed by Executive Order 13690, Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input (2015), Federal agencies, including DOE, continue to avoid development in a floodplain to the extent possible. When doing so is not possible, Federal agencies are directed to "expand management from the current base flood level to a higher vertical elevation and corresponding horizontal floodplain to address current and future flood risk and ensure that projects funded with taxpayer dollars last as long as intended." The higher flood elevation is based on one of three approaches: climate-informed science (preferred), freeboard value, or 0.2% annual flood change (500-year floodplain). EO 13690 and related information is available at https://www.energy.gov/nepa/articles/eo-13690-establishing-federal-flood-risk-management-standard-and-process-further.

C. Reporting

xxi. Reporting Requirements

Reporting requirements are identified on the Federal Assistance Reporting Checklist and Instructions, DOE F 4600.2, attached to the award agreement.

A sample checklist is available at:
https://www.netl.doe.gov/sites/default/files/netl-file/4600.2-FE.pdf.

xxii. Subaward and Executive Reporting

Prime Recipients awarded a new Federal financial assistance award greater than or equal to $30,000 as of October 1,2010 are subject to Federal Funding and Transparency Act of 2006 (FFATA) sub-award reporting requirements as outlined in 2 CFR Chapter 1, Part 170 REPORTING SUB-AWARD AND EXECUTIVE COMPENSATION INFORMATION.

The FFATA Subaward Reporting System (FSRS) is the reporting tool Federal prime awardees (i.e. prime contractors and prime grants recipients) use to capture and report subaward and executive compensation data regarding their first-tier subawards to meet the FFATA reporting requirements. Prime awardees must register with the new FSRS database and report the required data on their first tier subawardees/subrecipient at https://www.fsrs.gov.

Prime awardees must report the executive compensation for their own executives as part of their registration profile in the System for Award Management (SAM). The sub-award information entered in FSRS will then be displayed on https://www.usaspending.gov/ associated with the prime award furthering Federal spending transparency.

Applicants must ensure they have the necessary processes and systems in place to comply with the reporting requirements should they receive funding.

D. Applicant Representations and Certifications

xxiii. Lobbying Restrictions

By accepting funds under this award, the Prime Recipient agrees 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 U.S.C. §1913. This restriction is in addition to those prescribed elsewhere in statute and regulation.

xxiv. Nondisclosure and Confidentiality Agreements Representations

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

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

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:

1) ''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.''

   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.

2) Notwithstanding the 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.

xxv. Corporate Felony Convictions and Tax Liabilities Representations (March 2014)

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

(1) It is **not** a corporation that has been convicted of a felony criminal violation under any Federal law within the preceding 24 months; and

(2) 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 definition applies:

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.

VII. Questions/Agency Contacts

A. Questions

Questions regarding the **content of the funding opportunity announcement** must be submitted through the FedConnect portal. You must register with FedConnect to respond as an interested party to submit questions, and to view responses to questions. It is recommended that you register as soon after release of the FOA as possible to have the benefit of all responses. Applicants are encouraged to review previously issued Questions and Answers prior to the submission of questions. DOE/NNSA will try to respond to a question within 3 business days, unless a similar question and answer have already been posted on the website.

Questions and comments concerning this FOA shall be submitted not later than **3** business days prior to the application due date. Questions submitted after that date may not allow the Government sufficient time to respond.

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

B. Agency Contact

Name: Michelle Leaton
E-mail: michelle.leaton@netl.doe.gov

C. 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 announcement message is posted by registering with FedConnect as an interested party for this FOA. It is recommended that you register as soon after release of the FOA as possible to ensure you receive timely notice of any modifications or other announcements.

D. 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.

E. Commitment of Public Funds

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

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.

F. Treatment of Application Information (April 2023)

Applicants should not include trade secret or business sensitive, 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 secret or business sensitive, proprietary, or otherwise confidential information, it is furnished to the Federal 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 Freedom of Information Act. 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.

If an applicant chooses to submit business sensitive, trade secrets, proprietary, or otherwise confidential information, the applicant must provide **two copies** of the submission (e.g., Concept Paper, Full Application). The first copy should be marked "non-confidential" with the information believed to be confidential deleted. The second copy should be marked "confidential" and must clearly and conspicuously identify the business sensitive, trade secrets, proprietary, or otherwise confidential information and must be marked as described below. Failure to comply with these marking requirements may result in the disclosure of the unmarked information under the Freedom of Information Act or otherwise. The Government is not liable for the disclosure or use of unmarked information and may use or disclose such information for any purpose as authorized by law.

The cover sheet of the full application, and other applicant submission must be marked as follows and identify the specific pages business sensitive, trade secrets, proprietary, or otherwise confidential information:

> **Notice of Restriction on Disclosure and Use of Data**:
> Pages [**list applicable pages**] of this document may contain business sensitive, trade secrets, proprietary, or otherwise confidential 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 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]

In addition, (1) the header and footer of every page that contains business sensitive, trade secrets, proprietary, or otherwise confidential information must be marked as follows: "Contains Business Sensitive, Trade Secrets, Proprietary, Otherwise Confidential Information Exempt from Public Disclosure," and (2) every line or paragraph containing such information must be clearly marked with double brackets or highlighting. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

G. Evaluation and Administration by Non-Federal Personnel

In conducting the merit review, the Government may seek the advice of qualified non-Federal personnel as reviewers. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The applicant, by submitting its application, consents to the use of non-Federal reviewers/administrators. Non-Federal reviewers must sign conflict of interest and non-disclosure agreements prior to reviewing an application. Non-Federal personnel conducting administrative activities must sign a non-disclosure agreement.

H. Intellectual Property Developed Under This Program (September 2021)

Patent Rights: The government will have certain statutory rights in an invention that is conceived or first actually reduced to practice under a DOE award. 42 U.S.C. 5908 provides that title to such inventions vests in the United States, except where 35 U.S.C. 202 provides otherwise for nonprofit organizations or small business firms. However, the Secretary of Energy may waive all or any part of the rights of the United States subject to certain conditions.

Right to Request Patent Waiver: A selected entity may request a waiver of all or any part of the rights of the United States in inventions conceived or first actually reduced to practice in performance of an agreement as a result of this announcement, in advance of or within 30 days after the effective date of the award. Even if such advance waiver is not requested or the request is denied, the recipient will have a continuing right under the award to request a waiver of the rights of the United States in identified inventions, i.e., individual inventions conceived or first actually reduced to practice in performance of the award. Any patent waiver that may be granted is subject to certain terms and conditions in 10 CFR 784 see https://www.energy.gov/gc/services/technology-transfer-and-procurement/office-assistant-general-counsel-technology-transf-1 for further information.

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

- 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 IV, "Application and Submission Information; U.S. Competitiveness" 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 DECs prior to the issuance of awards under this FOA. DOE may require additional submissions or requirements as authorized by any applicable DEC.

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

I. Program Covered Under Special Protected Data Statute (December 2014)

This program is covered by a special protected data statute. The provisions of the statute provide for the protection from public disclosure, for a period of up to **5** years from the date of the development of data that would be trade secret, or commercial or financial information that is privileged or confidential, if the information had been obtained from a non-Federal party. Generally, the provision entitled, Rights in Data--Programs Covered Under Special Protected Data Statutes (Item 4 under 2 CFR 910 Appendix A to Subpart D), would apply to an award made under this announcement. This provision will identify data or categories of data first produced in the performance of the award that will be made available to the public, notwithstanding the statutory authority to withhold data from public dissemination and will also identify data that will be recognized by the parties as protected data. Any entity receiving an award or subaward under this announcement has the right to opt out of such data protection.

J. 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.

K. Notice of Right to Conduct a Review of Financial Capability

DOE reserves the right to conduct an independent third-party review of financial capability for applicants that are selected for negotiation of award (including personal credit information of principal(s) of a small business if there is insufficient information to determine financial capability of the organization).

L. Notice of Potential Disclosure Under Freedom of Information Act (FOIA)

Applicants should be advised that identifying information regarding all applicants, including applicant names and/or points of contact, may be subject to public disclosure under the Freedom of Information Act, whether or not such applicants are selected for negotiation of award.

M. Requirement for Full and Complete Disclosure

Applicants are required to make a full and complete disclosure of all information requested. Any failure to make a full and complete disclosure of the requested information may result in:

- The termination of award negotiations;
- The modification, suspension, and/or termination of a funding agreement;
- The initiation of debarment proceedings, debarment, and/or a declaration of ineligibility for receipt of Federal contracts, subcontracts, and financial assistance and benefits; and
- Civil and/or criminal penalties.

N. Retention of Submissions

DOE expects to retain copies of all submissions. No submissions will be returned. By applying to DOE for funding, applicants consent to DOE's retention of their submissions.

O. Protected Personally Identifiable Information

In responding to this FOA, applicants must ensure that Protected Personally Identifiable Information (PII) is not included in the application documents. These documents will be used by the Merit Review Committee in the review process to evaluate each application. PII is defined by the Office of Management and Budget (OMB) as:

Any information about an individual maintained by an agency, including but not limited to, education, financial transactions, medical history, and criminal or employment history and information that can be used to distinguish or trace an individual's identity, such as their name, social security number, date and place of birth, mother's maiden name, biometric records, etc., including any other personal information that is linked or linkable to an individual.

This definition of PII can be further defined as: (1) Public PII and (2) Protected PII.

1. Public PII: PII found in public sources such as telephone books, public websites, business cards, university listing, etc. Public PII includes first and last name, address, work telephone number, email address, home telephone number, and general education credentials.

2. Protected PII: PII that requires enhanced protection. This information includes data that if compromised could cause harm to an individual such as identity theft.

Listed below are examples of Protected PII that applicants must not include in the application files listed above to be evaluated by the Merit Review Committee. This list is not all inclusive.

- Social Security Numbers in any form
- Place of Birth associated with an individual
- Date of Birth associated with an individual
- Mother's maiden name associated with an individual
- Biometric record associated with an individual
- Fingerprint
- Iris scan
- DNA
- Medical history information associated with an individual
- Medical conditions, including history of disease
- Metric information, e.g. weight, height, blood pressure
- Criminal history associated with an individual
- Employment history and other employment information associated with an individual
- Ratings
- Disciplinary actions
- Performance elements and standards (or work expectations) are PII when they are so intertwined with performance appraisals that their disclosure would reveal an individual's performance appraisal
- Financial information associated with an individual
- Credit card numbers
- Bank account numbers
- Security clearance history or related information (not including actual clearances held)

P. Annual Compliance Audits

If an institution of higher education, non-profit organization, or state/local government is a Prime Recipient or Subrecipient and has expended $750,000 or more of Federal funds during the non-Federal entity's fiscal year, then a single or program-specific audit is required. For additional information, please refer to 2 C.F.R. § 200.501 and Subpart F.

If a for-profit entity is a Prime Recipient and has expended $750,000 or more of DOE funds during the entity's fiscal year, an annual compliance audit performed

by an independent auditor is required. For additional information, please refer to 2 C.F.R. § 910.501 and Subpart F.

Applicants and subrecipients (if applicable) should propose sufficient costs in the project budget to cover the costs associated with the audit. DOE will share in the cost of the audit at its applicable cost share ratio.

Q. Accounting System

If your application is selected for negotiation toward award, you should have an accounting system that meets government standards for recording and collecting costs. Reference 2 CFR 200 Subpart D for the applicable standards. If you have not had prior government awards or a recent accounting system review, DOE may request that the Defense Contract Audit Agency (DCAA) or an independent auditor verify that the accounting system is acceptable. A resulting award may contain a Term and Condition that prohibits DOE reimbursement until the system is deemed acceptable.

R. Indirect Rates

Potential recipients and major subrecipients will need to demonstrate how indirect rates are developed using an acceptable government methodology or current rate agreement. The Prime Recipient and major subrecipients may be subject to a DCAA or independent auditor indirect rate review if there has not been a certified rate audit within the previous twelve months. Additionally, annual indirect cost reconciliations are required, as applicable.

S. Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment (April 2023)

As set forth in 2 CFR 200.216, recipients and subrecipients are prohibited from obligating or expending project funds (federal 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 uses 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 Public Law 115-232, section 889, 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.

T. Prohibition Related to Foreign Government-Sponsored Talent Recruitment Programs (April 2023)

xxvi. 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.

xxvii. 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 U.S. 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.

U. Implementation of Executive Order 13798, Promoting Free Speech and Religious Liberty (November 2020)

States, local governments, or other public entities may not condition sub-awards in a manner that would discriminate, or disadvantage subrecipients based on their religious character.

V. Affirmative Action and Pay Transparency Requirements

All applicants must comply with all applicable federal labor and employment laws, including but not limited to Title VII of the Civil Rights Act of 1964, the Fair Labor Standards Act, the Occupational Safety and Health Act, and the National Labor Relations Act, which protects employees' right to bargain collectively and engage in concerted activities for the purpose of workers' mutual aid or protection.

All federally assisted construction contracts exceeding $10,000 annually will be subject to the requirements of Executive Order 11246:

(1) Recipients, subrecipients, contractors, and subcontractors are prohibited from discriminating in employment decisions on the basis of race, color, religion, sex, sexual orientation, gender identity, or national origin.

(2) Recipients and contractors are required to take affirmative action to ensure that equal opportunity is provided in all aspects of their employment. This includes flowing down the appropriate language to all subrecipients, contractors, and subcontractors.

(3) Recipients, subrecipients, contractors, and subcontractors are prohibited from taking adverse employment actions against applicants and employees for asking about, discussing, or sharing information about their pay or, under certain circumstances, the pay of their co-workers.

DOL's Office of Federal Contractor Compliance Programs (OFCCP) uses a neutral process to schedule compliance evaluations. Consult OFCCP's Technical

Assistance Guide[5] to gain an understanding of the requirements and possible actions the recipients, subrecipients, contractors, and subcontractors must take. Additional guidance may also be found in the National Policy Assurances, produced by DOE.

W. Foreign Collaboration Considerations

Consideration of new collaborations with foreign entities and governments. The recipient will be required to provide DOE with advanced written notification of any potential collaboration with foreign entities or governments in connection with its DOE-funded award scope. The recipient will then be required to await further guidance from DOE prior to contacting the proposed foreign entity or government regarding the potential collaboration or negotiating the terms of any potential agreement.

Existing collaborations with foreign entities and governments. The recipient will be required to provide DOE with a written list of all existing foreign collaborations in which has entered in connection with its DOE-funded award scope.

Description of collaborations that should be reported. In general, a collaboration will involve some provision of a thing of value to, or from, the recipient. A thing of value includes but may not be limited to all resources made available to, or from, the recipient in support of and/or related to the DOE award, regardless of whether or not they have monetary value. Things of value also may include in-kind contributions (such as office/laboratory space, data, equipment, supplies, employees, students). In-kind contributions not intended for direct use on the DOE award but resulting in provision of a thing of value from or to the DOE award must also be reported. Collaborations do not include routine workshops, conferences, use of the recipient's services and facilities by foreign investigators resulting from its standard published process for evaluating requests for access, or the routine use of foreign facilities by awardee staff in accordance with the recipient's standard policies and procedures.

[5] See OFCCP's Technical Assistance Guide at: https://www.dol.gov/sites/dolgov/files/ofccp/Construction/files/ConstructionTAG.pdf?msclkid=9e397d68c4b111ec9d8e6fecb6c710ec Also see the National Policy Assurances http://www.nsf.gov/awards/managing/rtc.jsp

VIII. Appendices

APPENDIX A – COST SHARE INFORMATION

Cost Sharing or Cost Matching

The terms "cost sharing" and "cost matching" are often used synonymously. The DOE Financial Assistance Regulations, 2 CFR 200.306, use both of the terms in the titles specific to regulations applicable to cost sharing. DOE almost always uses the term "cost sharing," as it conveys the concept that non-federal share is calculated as a percentage of the Total Project Cost. An exception is the State Energy Program Regulation, 10 CFR 420.12, State Matching Contribution. Here "cost matching" for the non-federal share is calculated as a percentage of the Federal funds only, rather than the Total Project Cost.

How Cost Sharing Is Calculated

As stated above, cost sharing is calculated as a percentage of the Total Project Cost. FFRDC/NL costs must be included in Total Project Costs.

The following example shows the math for calculating required cost share for a project with $2,000,000 in Federal funds with four tasks requiring different Non-federal cost share percentages:

Task	Proposed Federal Share	Federal Share %	Recipient Share %
Task 1 (R&D)	$1,000,000	80%	20%
Task 2 (R&D)	$500,000	80%	20%
Task 3 (Demonstration)	$400,000	50%	50%
Task 4 (Outreach)	$100,000	100%	0%

Federal share ($) divided by Federal share (%) = Task Cost

Each task must be calculated individually as follows:

Task 1
$1,000,000 divided by 80% = $1,250,000 (Task 1 Cost)
Task 1 Cost minus federal share = Non-federal share
$1,250,000 - $1,000,000 = $250,000 (Non-federal share)

Task 2
$500,000 divided 80% = $625,000 (Task 2 Cost)
Task 2 Cost minus federal share = Non-federal share
$625,000 - $500,000 = $125,000 (Non-federal share)

Task 3
$400,000 / 50% = $800,000 (Task 3 Cost)
Task 3 Cost minus federal share = Non-federal share
$800,000 - $400,000 = $400,000 (Non-federal share)

Task 4
Federal share = $100,000
Non-federal cost share is not mandated for outreach = $0 (Non-federal share)

The calculation may then be completed as follows:

Tasks	$ Federal Share	% Federal Share	$ Non-Federal Share	% Non-Federal Share	Total Project Cost
Task 1	$1,000,000	80%	$250,000	20%	$1,250,000
Task 2	$500,000	80%	$125,000	20%	$625,000
Task 3	$400,000	50%	$400,000	50%	$800,000
Task 4	$100,000	100%	$0	0%	$100,000
Totals	$2,000,000		$775,000		$2,775,000

Blended Cost Share %
Non-federal share ($775,000) divided by Total Project Cost ($2,775,000) = 27.9% (Non-federal)
Federal share ($2,000,000) divided by Total Project Cost ($2,775,000) = 72.1% (Federal)

What Qualifies For Cost Sharing

While it is not possible to explain what specifically qualifies for cost sharing in one or even a couple of sentences, in general, if a cost is allowable under the cost principles applicable to the organization incurring the cost and is eligible for reimbursement under a DOE grant or cooperative agreement, then it is allowable as cost share. Conversely, if the cost is not allowable under the cost principles and not eligible for reimbursement, then it is not allowable as cost share. In addition, costs may not be counted as cost share if they are paid by the Federal Government under another award unless authorized by Federal statute to be used for cost sharing.

The rules associated with what is allowable as cost share are specific to the type of organization that is receiving funds under the grant or cooperative agreement, though are generally the same for all types of entities. The specific rules applicable to:

- FAR Part 31 for For-Profit entities, (48 CFR Part 31); and
- 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.

In addition to the regulations referenced above, other factors may also come into play such as timing of donations and length of the project period of performance. For example, the value of

ten years of donated maintenance on a project that has a project period of performance of five years would not be fully allowable as cost share. Only the value for the five years of donated maintenance that corresponds to the project period of performance is allowable and may be counted as cost share.

Additionally, DOE generally does not allow pre-award costs for either cost share or reimbursement when these costs precede the signing of the appropriation bill that funds the award. In the case of a competitive award, DOE generally does not allow pre-award costs prior to the signing of the Selection Statement by the DOE Selection Official.

General Cost Sharing Rules on a DOE Award

1. Cash Cost Share – encompasses all contributions to the project made by the recipient or subrecipient(s), for costs incurred and paid for during the project. This includes when an organization pays for personnel, supplies, equipment for their own company with organizational resources. If the item or service is reimbursed for, it is cash cost share. All cost share items must be necessary to the performance of the project.

2. In-Kind Cost Share – encompasses all contributions to the project made by the recipient or subrecipient(s) that do not involve a payment or reimbursement and represent donated items or services. In-Kind cost share items include volunteer personnel hours, donated existing equipment, donated existing supplies. The cash value and calculations thereof for all In-Kind cost share items must be justified and explained in the Cost Share section of the project Budget Justification. All cost share items must be necessary to the performance of the project. If questions exist, consult your DOE contact before filling out the In-Kind cost share section of the Budget Justification.

3. Funds from other federal sources MAY NOT be counted as cost share. This prohibition includes FFRDC subrecipients. Non-federal sources include any source not originally derived from federal funds. Cost sharing commitment letters from subrecipients must be provided with the original application.

4. Fee or profit, including foregone fee or profit, are not allowable as project costs (including cost share) under any resulting award. The project may only incur those costs that are allowable and allocable to the project (including cost share) as determined in accordance with the applicable cost principles prescribed in FAR Part 31 for For-Profit entities and 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.

DOE Financial Assistance Rules 2 CFR Part 200 as amended by 2 CFR Part 910

As stated above, the rules associated with what is allowable cost share are generally the same for all types of organizations. Following are the rules found to be common, but again, the specifics are contained in the regulations and cost principles specific to the type of entity:

(A) Acceptable contributions. All contributions, including cash contributions and third party in-kind contributions, must be accepted as part of the Prime Recipient's cost sharing if such contributions meet all of the following criteria:

(1) They are verifiable from the recipient's records.

(2) They are not included as contributions for any other federally-assisted project or program.

(3) They are necessary and reasonable for the proper and efficient accomplishment of project or program objectives.

(4) They are allowable under the cost principles applicable to the type of entity incurring the cost as follows:

a. For-profit organizations. Allowability of costs incurred by for-profit organizations and those nonprofit organizations listed in Attachment C to OMB Circular A–122 is determined in accordance with the for-profit cost principles in 48 CFR Part 31 in the Federal Acquisition Regulation, except that patent prosecution costs are not allowable unless specifically authorized in the award document. (v) Commercial Organizations. FAR Subpart 31.2—Contracts with Commercial Organizations

b. Other types of organizations. For all other non-federal entities, allowability of costs is determined in accordance with 2 CFR Part 200 Subpart E.

(5) They are not paid by the Federal Government under another award unless authorized by Federal statute to be used for cost sharing or matching.

(6) They are provided for in the approved budget.

(B) Valuing and documenting contributions

(1) Valuing recipient's property or services of recipient's employees. Values are established in accordance with the applicable cost principles, which mean that amounts chargeable to the project are determined on the basis of costs incurred. For real property or equipment used on the project, the cost principles authorize depreciation or use charges. The full value of the item may be applied when the item will be consumed in the performance of the award or fully depreciated by the end of the award. In cases where the full value of a donated capital asset is to be applied as cost sharing or matching, that full value must be the lesser or the following:

a. The certified value of the remaining life of the property recorded in the recipient's accounting records at the time of donation; or

b. The current fair market value. If there is sufficient justification, the Contracting Officer may approve the use of the current fair market value of the donated property, even if it exceeds the certified value at the time of donation to the project. The Contracting Officer may accept the use of any reasonable basis for determining the fair market value of the property.

(2) Valuing services of others' employees. If an employer other than the recipient furnishes the services of an employee, those services are valued at the employee's regular rate of pay, provided these services are for the same skill level for which the employee is normally paid.

(3) Valuing volunteer services. Volunteer services furnished by professional and technical personnel, consultants, and other skilled and unskilled labor may be counted as cost sharing or matching if the service is an integral and necessary part of an approved project or program. Rates for volunteer services must be consistent with those paid for similar work in the recipient's organization. In those markets in which the required skills are not found in the recipient organization, rates must be consistent with those paid for similar work in the labor market in which the recipient competes for the kind of services involved. In either case, paid fringe benefits that are reasonable, allowable, and allocable may be included in the valuation.

(4) Valuing property donated by third parties.

a. Donated supplies may include such items as office supplies or laboratory supplies. Value assessed to donated supplies included in the cost sharing or matching share must be reasonable and must not exceed the fair market value of the property at the time of the donation.

b. Normally only depreciation or use charges for equipment and buildings may be applied. However, the fair rental charges for land and the full value of equipment or other capital assets may be allowed, when they will be consumed in the performance of the award or fully depreciated by the end of the award, provided that the Contracting Officer has approved the charges. When use charges are applied, values must be determined in accordance with the usual accounting policies of the recipient, with the following qualifications:

i. The value of donated space must not exceed the fair rental value of comparable space as established by an independent appraisal of comparable space and facilities in a privately-owned building in the same locality.
ii. The value of loaned equipment must not exceed its fair rental value.

(5) Documentation. The following requirements pertain to the recipient's supporting records for in-kind contributions from third parties:

a. Volunteer services must be documented and, to the extent feasible, supported by the same methods used by the recipient for its own employees.

b. The basis for determining the valuation for personal services and property must be documented.

APPENDIX B – WAIVER REQUESTS: FOREIGN ENTITY PARTICIPATION AND PERFORMANCE OF WORK IN THE UNITED STATES

1. Waiver for Foreign Entity Participation

Many of the technology areas DOE funds fall in the category of critical and emerging technologies (CETs). CETs are a subset of advanced technologies that are potentially significant to United States national and economy security.[6] For projects selected under this FOA, all recipients and subrecipients must be organized, chartered or incorporated (or otherwise formed) under the laws of a state or territory of the United States; have majority domestic ownership and control; and have a physical location for business operations in the United States. To request a waiver of this requirement, an applicant must submit an explicit waiver request in the Full Application.

Waiver Criteria

Foreign entities seeking to participate in a project funded under this FOA must demonstrate to the satisfaction of DOE that:

a. Its participation is in the best interest of the United States industry and United States economic development;
b. The project team has appropriate measures in place to control sensitive information and protect against unauthorized transfer of scientific and technical information;
c. Adequate protocols exist between the United States subsidiary and its foreign parent organization to comply with export control laws and any obligations to protect proprietary information from the foreign parent organization;
d. The work is conducted within the United States and the entity acknowledges and demonstrates that it has the intent and ability to comply with the U.S. Competitiveness Provision (see Section VI.B.xxi.); and
e. The foreign entity will satisfy other conditions that may be deemed necessary by DOE to protect United States government interests.

Content for Waiver Request

A Foreign Entity waiver request must include the following:

a. Information about the entity: name, point of contact, physical address, and proposed type of involvement in the project;
b. Country of incorporation, the extent of the ownership/level control by foreign entities, whether the entity is state owned or controlled, a summary of the ownership breakdown of the foreign entity and the percentage of ownership/control by foreign entities, foreign shareholders, foreign state or foreign individuals;
c. The rationale for proposing a foreign entity participate (must address criteria above);

d. A description of the project's anticipated contributions to the United States economy;
    - How the project will benefit the United States, including manufacturing, contributions to employment in the United States and growth in new markets and jobs in the United States;
    - How the project will promote manufacturing of products and/or services in the United States;
e. A description of how the foreign entity's participation is essential to the project;
f. A description of the likelihood of Intellectual Property (IP) being created from the work and the treatment of any such IP; and
g. Countries where the work will be performed (Note: if any work is proposed to be conducted outside the United States, the applicant must also complete a separate request foreign work waiver).

DOE may also require:

- A risk assessment with respect to IP and data protection protocols that includes the export control risk based on the data protection protocols, the technology being developed and the foreign entity and country. These submissions could be prepared by the project lead (if not the prime recipient), but the prime recipient must make a representation to DOE as to whether it believes the data protection protocols are adequate and make a representation of the risk assessment – high, medium or low risk of data leakage to a foreign entity.
- Additional language to be added to any agreement or subagreement to protect IP, mitigate risk or other related purposes.

DOE may require additional information before considering the waiver request.

DOE's decision concerning a waiver request is not appealable.

xxviii. Waiver for Performance of Work in the United States (Foreign Work Waiver)

As set forth in Section IV.K.iii., all work under funding under this FOA must be performed in the United States. To seek a waiver of the Performance of Work in the United States requirement, the applicant must submit an explicit waiver request in the Full Application. A separate waiver request must be submitted for each entity proposing performance of work outside of the United States.

Overall, a waiver request must demonstrate to the satisfaction of DOE that it would further the purposes of this FOA and is otherwise in the economic interests of the United States to perform work outside of the United States. A request for a foreign work waiver must include the following:

1. The rationale for performing the work outside the United States ("foreign work");
2. A description of the work proposed to be performed outside the United States;
3. An explanation as to how the foreign work is essential to the project;
4. A description of the anticipated benefits to be realized by the proposed foreign work and the anticipated contributions to the United States economy;
5. The associated benefits to be realized and the contribution to the project from the foreign work;
6. How the foreign work will benefit the United States, including manufacturing, contributions to employment in the United States and growth in new markets and jobs in the United States;
7. How the foreign work will promote manufacturing of products and/or services in the United States;
8. A description of the likelihood of Intellectual Property (IP) being created from the foreign work and the treatment of any such IP;
9. The total estimated cost (DOE and recipient cost share) of the proposed foreign work;
10. The countries in which the foreign work is proposed to be performed; and
11. The name of the entity that would perform the foreign work. Information about the entity(ies) involved in the work proposed to be conducted outside the United States. (i.e., entity seek a waiver and the entity(ies) that will conduct the work).

DOE may require additional information before considering the waiver request.

DOE's decision concerning a waiver request is not appealable.

APPENDIX C – REQUIRED USE OF AMERICAN IRON, STEEL, MANUFACTURED PRODUCTS, AND CONSTRUCTION MATERIALS - BUY AMERICA REQUIREMENTS FOR INFRASTRUCTURE PROJECTS (APRIL 2023)

A. Definitions

For purposes of the Buy America Requirements, based both on statute and OMB Memorandum M-22-11 dated April 18, 2022, the following definitions apply:

Construction materials includes an article, material, or supply—other than an item of primarily iron or steel; a manufactured product; cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives[6] — that 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; or
- drywall.

Infrastructure includes, at a minimum, the structures, facilities, and equipment for, in the United States, 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. Infrastructure includes facilities that generate, transport, and distribute energy.

Moreover, according to the OMB Memorandum M-22-11:

> When determining if a program has infrastructure expenditures, Federal agencies should interpret the term "infrastructure" broadly and consider the definition provided above as illustrative and non-exhaustive. When determining if a particular construction project of a type not listed in the definition above constitutes "infrastructure", agencies should consider whether the project will serve a public function, including whether the project is publicly owned and operated, privately operated on behalf of the public, or is a place of public accommodation, as opposed to a project that is privately owned and not open to the public. Projects with the former qualities have greater indication of infrastructure, while projects with the latter quality have fewer. Projects consisting solely of the purchase, construction, or improvement of a private home for personal use, for example, would not constitute an infrastructure project.

[6] BIL, § 70917(c)(1).

The Agency, not the applicant, will have the final say as to whether a given project includes infrastructure, as defined herein. Accordingly, in cases where the "public" nature of the infrastructure is unclear, but the other relevant criteria are met, DOE strongly recommends that applicants complete their full application with the assumption that Buy America requirements will apply to the proposed project.

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

B. Buy America Requirements for Infrastructure Projects ("Buy America" requirements)
In accordance with section 70914 of the BIL, none of the project funds (includes federal share and recipient cost share) may be used for a project for infrastructure unless:

> (1) all iron and steel used in the project are 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 materials[7] are produced in the United States—this means that all manufacturing processes for the construction material occurred in the United States.

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

These requirements must flow down to all sub-awards, all contracts, subcontracts and purchase orders for work performed under the proposed project, except where the prime recipient is a for-profit entity. Based on guidance from the OMB, the Buy America requirements of the BIL do not apply to DOE projects in which the prime recipient is a for-profit entity; the

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

requirements only apply to projects whose prime recipient is a State, local government, Indian tribe, Institute of Higher Education, or nonprofit organization.

For additional information related to the application and implementation of these Buy America requirements, please see OMB Memorandum M-22-11, issued April 18, 2022: https://www.whitehouse.gov/wp-content/uploads/2022/04/M-22-11.pdf

Note that for all applicants – both non-Federal entities and for-profit entities – DOE is including a Program policy Factor that the Selection Official may consider in determining which Full Applications to select for award negotiations that considers whether the applicant has made a commitment to procure U.S. iron, steel, manufactured products, and construction materials in its project.

C. Waivers

The DOE financial assistance agreement will require each recipient: (1) to fulfill the commitments made in its application regarding the procurement of U.S.-produced products and (2) to fulfill the commitments made in its application regarding the procurement of other key component metals and manufactured products domestically that are deemed available in sufficient and reasonable available quantities or of a satisfactory quality at the time of award negotiation.

In limited circumstances, DOE may waive the application of the Buy America Requirements where DOE determines that:

> (1) applying the Buy America requirements would be inconsistent with the 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; 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.

If an applicant or recipient is seeking a waiver of the Buy America requirements, it may submit a waiver request after it has been notified of its selection for award negotiations. A waiver request must include:

- A detailed justification for the use of "non-domestic" iron, steel, manufactured products, or construction materials to include an explanation as to how the non-domestic item(s) is essential to the project

- A certification that the applicant or recipient made a good faith effort to solicit bids for domestic products supported by terms included in requests for proposals, contracts, and nonproprietary communications with potential suppliers;
- Applicant /Recipient name and Unique Entity Identifier (UEI)
- Total estimated project cost, DOE and cost-share amounts
- Project description and location (to the extent known)
- List and description of iron or steel item(s), manufactured goods, and construction material(s) the applicant or recipient seeks to waive from Domestic Content Procurement Preference requirement, including name, cost, country(ies) of origin (if known), and relevant Product Service Codes (PSC) and North American Industry Classification System (NAICS) code for each.
- Waiver justification including due diligence performed (e.g., market research, industry outreach) by the applicant or recipient
- Anticipated impact if no waiver is issued

DOE may require additional information before considering the waiver request.

Waiver requests are subject to public comment periods of no less than 15 days and must be reviewed by the Made in America Office. There may be instances where an award qualifies, in whole or in part, for an existing waiver described at DOE Buy America Requirement Waiver Requests

The applicant does not have the right to appeal DOE's decision concerning a waiver request.

APPENDIX D – STATEMENT OF PROJECT OBJECTIVES TEMPLATE

Statement of Project Objectives (SOPO): The Project Narrative must include a detailed SOPO that addresses how the project objectives will be met. The SOPO must contain a clear, concise description of all activities that will be completed during project performance and follow the structure/format outlined below. Since the SOPO may be released (in whole or in part) to the public by DOE after award, it shall not contain proprietary or confidential business information.

The SOPO generally consists of less than five **(5)** pages to describe the proposed work. Since the SOPO is part of the Project Narrative, the number of pages must be included within the Project Narrative page limit. Applicants shall prepare the SOPO according to the following format.

Italicized text in the following template is provided as guidance and should be removed by the Applicant when preparing their SOPO. All other text is intended to be included in the Applicant's proposed SOPO.

[***BEGININNING OF SOPO TEMPLATE*****]**

STATEMENT OF PROJECT OBJECTIVES (SOPO)
Insert Project Title

A. OBJECTIVES
Clearly and concisely describe the objective(s) for each phase of the project. This section should not exceed one-half page.

B. SCOPE OF WORK
Summarize the planned effort and approach to achieve the proposed objectives (including each phase). This section should not exceed one-half page.

C. TASKS TO BE PERFORMED

Include clear and concise tasks and subtasks (if needed) organized in a logical sequence. Group the tasks and subtasks into corresponding phases, if applicable. Include go/no-go decision points, define the criteria used to demonstrate meaningful and measurable technical progress, and provide the data needed to justify continuing the project.

Task 1.0 - Project Management and Planning (Phases 1 and 2) *(REQUIRED; APPLICANT INSERT TASK 1.0 AND ALL SUBTASKS)*

Subtask 1.1 – Project Management
Within 30 days of award, the Recipient shall revise the version of the Project Management Plan (PMP) that was submitted with their application by including details from the award negotiation process and through consultation with the Federal Project Officer (FPO). The PMP

shall include all phases of the project. The Recipient shall not proceed beyond Task 1.0 until the updated PMP has been accepted by the FPO.

The PMP shall be revised and resubmitted as often as necessary to capture any major/significant changes to the planned approach, budget, key personnel, major resources, etc.

The Recipient shall manage and direct the project in accordance with the approved Project Management Plan to meet all technical, schedule and budget objectives and requirements. The Recipient will coordinate activities to effectively accomplish the work. The Recipient will ensure that project plans, results, and decisions are appropriately documented, and project reporting and briefing requirements are satisfied.

Include additional tasks and subtasks as appropriate using the following format.

Research and Development (Phase 1)

Task 2.0 – **(*State title of task and provide description)***

Subtask 2.1 - *(State title of subtask and provide description)*

Task 3.0 - ***(State title of task and provide description)***

Task x.0 - ***(State title of task and provide description)***

Go/No-Go Decision Point: The Go/No-Go Decision will be based on the completion of Phase 1 tasks and the submission of associated deliverables *[Multiple Decision Points may be added as needed based on the completion of major tasks and/or project milestones]*. **The Recipient will not begin the next phase until receiving written authorization from the DOE Contracting Officer (CO) to proceed. Written authorization can be in the form of email or letter issued by the CO.**

Demonstration (Phase 2)
(PHASE 2 MUST INCLUDE TASKS FOR "DEVELOP TEST PLAN" AND "EXECUTE TEST PLAN")

Task x.0 - ***(State title of task and provide description)***

Task x.0 - Develop Test Plan – ***(provide description)***

Go/No-Go Decision Point: The Go/No-Go Decision will be based on the completion of the Test Plan and the submission of associated deliverables *[Multiple Decision Points may be added as needed based on the completion of major tasks and/or project milestones]*. **The Recipient will not begin executing the Test Plan until**

receiving written authorization from the DOE Contracting Officer (CO) to proceed. Written authorization can be in the form of email or letter issued by the CO.

Task x.0 - Execute Test Plan – ***(provide description)***

Task x.0 - ***(State title of task and provide description)***

D. DELIVERABLES

The Recipient shall include a list of deliverables that will be submitted to the NETL FPO during the project.

Subtask 1.1 – Project Management Plan – Update due 30 days after award. Revisions to the PMP shall be submitted as needed or as requested by the NETL FPO.

Subtask x.x – Test Plan – *Due before the Go/No-Go Decision Point*

List additional deliverables as appropriate.

In addition to the deliverables listed above, the Recipient shall submit all periodic, topical, final, and other reports in accordance with the Federal Assistance Reporting Checklist and accompanying instructions.

E. BRIEFINGS/TECHNICAL PRESENTATIONS

The Recipient shall prepare, and present periodic briefings, technical presentations and demonstrations as requested by the FPO, which may be held at a DOE or Recipient's facility, other mutually agreeable location, or virtually. These may include all or a combination of the following:

Kickoff Briefing – Not more than 30 days after submission of the updated Project Management Plan, the Recipient shall prepare and present a project summary briefing as part of a Project Kickoff Meeting.

Go/No-Go Decision Point Briefing – Not less than 90 days prior to the planned start of a new phase, the Recipient shall brief the DOE on the results to date, and their plans for the subsequent phase(s) of work. The DOE will consider the information from this briefing, as well as the content of deliverables submitted to date, prior to authorizing continuing the project.

Final Project Briefing – Not less than 30 days prior to the end of the project, the Recipient shall prepare and present a Final Project Briefing on the results and accomplishments of the entire project.

Other Briefings – The Recipient shall prepare and present technical, financial, and/or

administrative briefings as requested by the DOE. Additionally, the DOE may require Recipients to make technical presentations at national and/or industry conferences.

[***END OF SOPO TEMPLATE*****]**

APPENDIX E – PROJECT MANAGEMENT PLAN TEMPLATE

REMINDER: APPLICANTS SHOULD SINGLE SPACE THE PROJECT MANAGEMENT PLAN IN ACCORDANCE WITH THE FORM AND CONTENT REQUIREMENTS IN SECTION IV AND REMOVE THIS BLOCK PRIOR TO SUBMISSION.

Title Page:

PROJECT MANAGEMENT PLAN

{*Title of Project*}

WORK PERFORMED UNDER AGREEMENT

{*Agreement Number/TBD*}

{*Recipient Organization Name*}

{*Address*}

{*City, State, Zip Code*}

Period of Performance: {*start date*} **to** {*end date*}

Current Budget Period: {start date} to {end date}

Submitted: {*date*}

Revision: {*#*}

PRINCIPAL INVESTIGATOR

{*Name*}

{*Phone Number*}

{*E-Mail*}

BUSINESS CONTACT

{*Name*}

{*Phone Number*}

{*E-Mail*}

SUBMITTED TO

U. S. Department of Energy

National Energy Technology Laboratory

DOE Project Officer: {*Name/TBD*}

This report should not contain any proprietary, business sensitive, or other information not subject to public release.

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ACRONYM LIST

DMP: Data Management Plan

DOE: Department of Energy

FOA: Funding Opportunity Announcement

FY: Fiscal Year (federal)

PMP: Project Management Plan

Q#: Quarter #

SOPO: Statement of Project Objectives

Add project specific acronyms as needed.

RECIPIENT SHOULD REMOVE ALL ITALICIZED INSTRUCTIONS AND EXAMPLES FROM EACH.

EXECUTIVE SUMMARY AND TECHNICAL APPROACH

Provide a synopsis of the overall project that briefly describes the technical approach, objective(s), goals, and expected results. Identify and discuss technology or techniques resulting from the project. Discuss technology transfer activities and information dissemination/sharing that will occur during this project.

KEY PERSONNEL

List the project team's key personnel, their role, and contact information. Key personnel are identified in the Financial Assistance Agreement and, at a minimum, include the Principal Investigator and Business Point of Contact. Note that changes to key personnel require prior DOE approval.

KEY PERSONNEL			
Role	**Name**	**Phone**	**Email**
Principal Investigator			
Business Point of Contact			

TEAM MEMBERS

Complete the following table to provide a summary of Prime Recipient and Team Member planned activities by SOPO task and/or subtask number(s).

SUMMARY OF TEAM MEMBER PLANNED ACTIVITIES	
Team Member	**Planned Activities by SOPO Task/Subtask Number(s)**
Prime Recipient	*1.0 - Manage and execute the project. Develop required plans.* *X.Y - Design evaluations.*
Utility ABC	*X.Y - Providing data.* *X.Y - Software demonstration host; will install at backup/secondary control center.*
Professor Tom Smith, (University Name)	*X.Y - Engineering code development.*

Complete the following table to provide information about the roles, location, and funding for members of the project team. If a team member has multiple roles and/or multiple locations, include a separate entry for each role and location. Include any team member:

- *receiving or providing project funds (government or cost share) equal to or greater than $25,000;*
- *providing intellectual property (include value if applicable); and/or*
- *serving as demonstration host/location regardless of value.*

For each team member listed in the table, select the role description from the following:

- *Subrecipient,*
- *Demonstration Host/Location,*
- *Vendor (e.g., services, equipment, supplies, etc.)*
- *Intellectual Property Provider (e.g., source code, data, algorithms, etc.),*
- *Cost Share Provider, and*

- *Other*

Use the address that is closest to where the team member's work will be performed.

SUMMARY OF TEAM MEMBER ROLES AND FUNDING			
Team Member	**Role**	**Location**	**Value**
Utility XYZ	*Demo Host/Location*	*123 Main Street Morgantown, WV 26505*	*$0*
Utility XYZ	*Demo Host/Location*	*14 Main Street Pittsburgh, PA 15219*	*$0*
Vendor ABC	*Vendor*	*456 Main Street Pittsburgh, PA 15219*	*$100,000*
Another Utility	*Cost Share Provider*	*1 Another Utility Drive Morgantown, PA 19543*	*$250,000*

PROJECT BUDGET AND SPEND PLAN

Complete the following tables and ensure that each budget category is consistent with the SF-424A form included with the Financial Assistance Agreement.

PLANNED BUDGET - PHASE 1 (if applicable)			
Budget Category	**Federal Share**	**Non-Federal Share**	**Total**
Personnel			
Fringe Benefits			
Travel			
Equipment			
Supplies			
Contractual (List each contract valued at $25,000 or more. Add rows as necessary)			
Remaining Contractual (Sum of all contracts that are individually valued at under $25,000)			
Construction			
Other			
Sub-Total Direct Charges			
Indirect Charges			
Total			

PLANNED BUDGET - PHASE 2 (if applicable)			
Budget Category	**Federal Share**	**Non-Federal Share**	**Total**
Personnel			
Fringe Benefits			
Travel			
Equipment			
Supplies			
Contractual (List each contract valued at $25,000 or more. Add rows as necessary)			
Remaining Contractual (Sum of all contracts that are individually valued at under $25,000)			
Construction			
Other			
Sub-Total Direct Charges			
Indirect Charges			
Total			

Complete the following table to outline the planned spending for each quarter during the project. The list should correspond to the Federal Fiscal Year (FY). For example, "FY21, Q1" would refer to the quarter that began October 1, 2020.

QUARTERLY SPEND PLAN			
Quarter	**Federal Share**	**Non-Federal Share**	**Total**
FY##, Q1			
FY##, Q2			
FY##, Q3			
FY##, Q4			
FY##, Q1			
Add/Remove rows as needed.			
TOTAL			

MILESTONE LOG

Complete the following table to identify milestones that demonstrate significant progress toward meeting the overall project goals. If the project contains any go/no-go decision points, include them and their associated decision criteria in the table. A milestone is a time-based marker that indicates that a significant activity, process, or phase of work has been initiated or completed. For each milestone, list the associated SOPO task/subtask and how the achievement of the milestone will be verified. Additional milestone guidance is provided immediately following this PMP template.

MILESTONE LOG			
Milestone (or Decision Point)	**SOPO Task/ Subtask Number**	**Planned Completion Date**	**Verification Method (or Decision Criteria)**
NDAs with industry partners are signed	*X.Y*	*MM/DD/YY*	*Confirmation email to Federal Project Officer.*
Design specification complete.	*X.Y*	*MM/DD/YY*	*Confirmed in quarterly report.*

PROJECT SCHEDULE AND DELIVERABLES

Complete the following table to provide the schedule and estimated cost for executing each of the tasks and subtasks described in the SOPO.

SCHEDULE & COST SUMMARY				
SOPO Task/ Subtask Number	**SOPO Task/ Subtask Title**	**Planned Start Date**	**Planned Completion Date**	**Planned Total Cost**
1.0	*Project Management and Planning*	*MM/DD/YY*	*MM/DD/YY*	

Complete the following table to include only the deliverables defined in the SOPO.

DELIVERABLES LOG		
SOPO Task/ Subtask Number	**Deliverable**	**Planned Completion Date**
1.1	*Project Management Plan*	*MM/DD/YY*
1.2	*Commercialization Plan*	*MM/DD/YY*

METRICS

Complete the following table to include all the metrics stipulated in the FOA, and any metrics defined by the Recipient.

PROJECT METRICS			
SOPO Task/ Subtask Number	**Tracking Metric**	**Units** (%, $, #, etc.)	**Goal**
X.X	*Estimated capital cost*	*$/unit*	*$1,000*
X.X	*Number of utilities participating in energy emergency exercises*	*#*	*15*
X.X	*System energy efficiencies*	*%*	*Improvement by >20%*
X.X	*Outage time of critical loads*	*Hours/ Interruption*	*Reduced by >98%*

RISK MANAGEMENT

Complete the following table to identify both internal and external risks (i.e., technical, resource, management, etc.), that may impact the likelihood of project success. For each identified risk, indicate any relevant task/subtask, likelihood of occurrence and the extent and potential impact on successful project completion. Provide a narrative below the table that describes the project's risk management process, including at a minimum: monitoring frequency, new risk identification, risk retirement, and team member involvement.

RISK MANAGEMENT LOG			
Risk	**Likelihood** (High, Medium, Low) **Impact** (High, Medium, Low)	**Potential Impact** (Identify SOPO Task/Subtask, if applicable)	**Mitigation Strategy**
Inability to secure required cost share.	*Low* *High*	*Scope of project will be reduced or project may be terminated.*	*{Insert appropriate mitigation strategy here}*
Loss of utility partner.	*Low* *Medium*	*Significant delay in starting demonstration phase in Task 5.0.*	*{Insert appropriate mitigation strategy here}*

Guidance for Creating Project Management Plan Milestones

A milestone is used to gauge overall progress toward achieving the project goals. In order to exhibit project progress/achievement as accurately as possible, a milestone must be specific, measurable, attainable, relevant, and timely. While DOE expects all projects to have at least one high-level milestone per year, a sufficient number of milestones should be included that demonstrate work completed or progress made towards achieving project goals. Fundamentally, a milestone:

- *Marks the end or the beginning of an event;*
- *Occurs by a specific date;*
- *Has no duration of time, expends no resources, and has no associated costs; and*
- *Can be verified.*

A milestone is not a process, task, activity, or deliverable. However, as shown in the following examples, the completion of a process, task, activity; or submission of a deliverable can be a milestone.

- ***A process**: "Oversight of the NEPA program" may be a significant element of the project, however it does not help measure actual progress. On the other hand, "Obtain a NEPA Categorical Exclusion" (as part of the NEPA process) can be a milestone.*
- ***A SOPO task/subtask or activity**: While the task "Development of the Preliminary Design" may be substantial, it is not a milestone. However, "Complete the Preliminary Design" could be a milestone since it would be a measure of progress made towards achieving the project goals.*
- ***A deliverable**: "Submit the Communications Plan" may be considered a milestone since it marks completion of a significant task, activity, phase, etc. As such, the deliverable can provide a measure of project progress. However, unless the deliverable marks the completion of an important work package or phase, it may not possess sufficient significance to warrant being a milestone.*

It is understood that Recipients will use a variety of internal indicators, benchmarks, etc. to track/gauge the progress made by the team toward completing the planned project. However, many of these may not have the significance to be included as a PMP milestone.

APPENDIX F – DATA MANAGEMENT PLAN

A Data Management Plan ("DMP") explains how data generated in the course of the research or work performed under an assistance award will be shared and preserved or, when justified, explains why data sharing or preservation is not possible or scientifically appropriate.

DMP Requirements

In order for a DMP to be considered acceptable, the DMP must address the following:

At a minimum, the DMP must describe how data sharing and preservation will enable validation of the results from the proposed work, or how results could be validated if data are not shared or preserved.

The DMP must provide a plan for making all research data displayed in publications resulting from the proposed work digitally accessible 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 in accordance with the principles stated above. 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.

The DMP should consult and reference available information about data management resources to be used in the course of the proposed work. In particular, a DMP that explicitly or implicitly commits 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 DOE 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 DOE facilities can be found in the additional guidance from the sponsoring program.

The DMP 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 laws (i.e., export control laws), and DOE regulations, orders, and policies.

Data Determination for a DMP

The Principal Investigator should determine which data should be the subject of the DMP and, in the DMP, propose which data should be shared and/or preserved in accordance with the DMP Requirements noted above.

For data that will be generated through the course of the proposed work, the Principal Investigator should indicate what types of data should be protected from immediate public disclosure by DOE (referred to as "protected data") and what types of data that DOE should be able to release immediately. Similarly, for data developed outside of the proposed work at private expense that will be used in the course of the proposed work, the Principal Investigator should indicate whether that type of data will be subject to public release or kept confidential (referred to as "limited rights data"). Any use of limited rights data or labeling of data as "protected data" must be consistent with the DMP Requirements noted above.

Suggested Elements for a DMP

The following list of elements for a DMP provides suggestions regarding the data management planning process and the structure of the DMP:

Data Types and Sources: A brief, high-level description of the data to be generated or used through the course of the proposed work and which of these are considered digital research data necessary to validate the research findings or results.

Content and Format: A statement of plans for data and metadata content and format including, where applicable, a description of documentation plans, annotation of relevant software, and the rationale for the selection of appropriate standards. Existing, accepted community standards should be used where possible. Where community standards are missing or inadequate, the DMP could propose alternate strategies for facilitating sharing, and should advise the sponsoring program of any need to develop or generalize standards.

Sharing and Preservation: A description of the plans for data sharing and preservation. This should include, when appropriate: the anticipated means for sharing and the rationale for any restrictions on who may access the data and under what conditions; a timeline for sharing and preservation that addresses both the minimum length of time the data will be available and any anticipated delay to data access after research findings are published; any special requirements for data sharing, for example, proprietary software needed to access or interpret data, applicable policies, provisions, and licenses for re-use and re-distribution, and for the production of derivatives, including guidance for how data and data products should be cited; any resources and capabilities (equipment, connections, systems, software, expertise, etc.) requested in the research proposal that are needed to meet the stated goals for sharing and preservation (this could reference the relevant section of the associated research proposal and budget request); and whether/where the data will be preserved after direct project funding ends and any plans for the transfer of responsibilities for sharing and preservation. A description of how the recipient intends to make the results of any resulting DOE-funded work available to the public, including the relevant technical community.

Protection: A statement of plans, where appropriate and necessary, to 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; and avoid significant negative impact on innovation, and U.S. competitiveness.

Rationale: A discussion of the rationale or justification for the proposed data management plan including, for example, the potential impact of the data within the immediate field and in other fields, and any broader societal impact.

Additional Guidance

In determining which data should be shared and preserved, researchers must consider the data needed to validate research findings as described in the Requirements and are encouraged to consider the potential benefits of their data to their own fields of research, fields other than their own, and society at large.

DMPs should reflect relevant standards and community best practices and make use of community accepted repositories whenever practicable.

Costs associated with the scope of work and resources articulated in a DMP may be included in the proposed research budget as permitted by the applicable cost principles.

To improve the discoverability of and attribution for datasets created and used in the course of research, DOE encourages the citation of publicly available datasets within the reference section of publications, and the identification of datasets with persistent identifiers such as Digital Object Identifiers (DOIs). In most cases, DOE can provide DOIs free of charge for data resulting from DOE-funded research through its Office of Scientific and Technical Information (OSTI) DataID Service.

Definitions

Data Preservation: Data preservation means providing for the usability of data beyond the lifetime of the research activity that generated them.

Data Sharing: Data sharing means making data available to people other than those who have generated them. Examples of data sharing range from bilateral communications with colleagues, to providing free, unrestricted access to anyone through, for example, a web-based platform.

Digital Research Data: The term digital data encompasses a wide variety of information stored in digital form including: experimental, observational, and simulation data; codes, software and algorithms; text; numeric information; images; video; audio; and associated metadata. It also encompasses information in a variety of different forms including raw, processed, and analyzed data, published and archived data.

Research Data: The recorded factual material commonly accepted in the scientific community as necessary to validate research findings, but not any of the following: preliminary analyses, drafts of scientific papers, plans for future research, peer reviews, or communications with colleagues. This 'recorded' material excludes physical objects (e.g., laboratory samples). Research data also do not include:

(A) Trade secrets, commercial information, materials necessary to be held confidential by a researcher until they are published, or similar information which is protected under law; and

(B) Personnel and medical information and similar information the disclosure of which would constitute a clearly unwarranted invasion of personal privacy, such as information that could be used to identify a particular person in a research study."

Validate: In the context of DMPs, validate 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.