

FINANCIAL ASSISTANCE FUNDING OPPORTUNITY ANNOUNCEMENT



Department of Energy (DOE)

Office of Electricity (OE)

Increasing Utilization and Reliability of Electric Infrastructure with Grid-enhancing technologies (GETs)

Funding Opportunity Announcement (FOA) Number: DE-FOA-0002948

FOA Type: **Amendment 000002**

Assistance Listing Number: 81.122

FOA Issue Date:	02/24/2023
Amendment 000001 Issue Date:	03/10/2023
Amendment 000002 Issue Date:	05/23/2023
Submission Deadline for Concept Papers:	~~3/16/2023/8:00 PM ET*~~ 3/30/2023/8:00 PM ET*
Submission Deadline for Full Applications:	~~5/9/2023/8:00 PM ET*~~ 5/23/2023/8:00 PM ET* 6/6/2023 /8:00 PM ET*
Expected Date for Concept Paper Notifications:	~~4/6/2023~~ 4/20/2023
Expected Date for Selection Notifications:	~~7/13/2023~~ 7/27/2023 9/22/2023
Expected Date for Award:	~~9/30/2023~~ 10/16/2023 12/11/2023

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

AMENDMENTS

All changes to the Funding Opportunity Announcement as a result of Amendment 000002 are highlighted in yellow.

Amendment No.	Date	Description of Amendment
000001	03/10/2023	Due dates are being updated on the cover page of the FOA. Incorrect reference to Concept Paper Cover Page sample is removed in Section IV.B.i table. Incorrect reference to Project Narrative Cover Page sample is removed in Section IV.C.vi table.
000002	05/23/2023	Due dates are being updated on the cover page of the FOA. Added a table in Section IV of APPENDIX D – PROJECT MANAGEMENT PLAN TEMPLATE for SOPO task category and its cost sharing information.

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. 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.

- **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

This Funding Opportunity Announcement (FOA) is issued in accordance with statutory authority provided by:

- Public Law (PL) 95-91, DOE Organization Act
- Energy Act of 2020 (Division Z of the “Consolidated Appropriations Act, 2021”)
- PL 109-58, Energy Policy Act 2005,
- PL 102-486, Energy Policy Act 1992,

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

Transferring a large amount of power from renewable energy resources such as wind and solar to load centers will require upgrades or expansion to the nation’s electric transmission infrastructure potentially across long distances and across balancing authorities. New transmission infrastructure can be difficult to build, often taking many years to properly plan, site, permit, and gain community acceptance. Taking full advantage of existing corridors will be critical for enabling renewable deployment. Grid Enhancing Technologies (GETs), such as dynamic line rating and power flow controls, have been shown to improve the energy transfer capabilities of existing transmission paths and are able to be deployed more quickly than building new lines at costs significantly below traditional upgrades. However, transmission organizations and system operators across the country have been slow to adopt Grid Enhancing Technologies for a variety of reasons, including data availability and a lack of rigorous, independent testing of the devices. Often, utility decision makers are left with little more than trust of the vendor to assuage concerns about price, true economic benefits, deployment schemes, deployment usage characteristics, and challenges in integrating the technology with existing systems and business/market practices.

This Funding Opportunity Announcement attempts to address the findings of the 2022 U.S. Department of Energy (DOE) Report Grid Enhancing Technologies: A Case Study on Ratepayer Impact [1]. In addition, this also helps further efforts for Non-Wire

1 Grid Enhancing Technologies – A Case Study on Ratepayer Impact.

<https://www.energy.gov/oe/articles/doe-study-shows-maximizing-capabilities-existing-transmission-lines-through-grid>

Solutions (NWS), and DOE Electricity Advisory Committee (EAC) recommendation: “Increase the R&D emphasis on NWS, e.g., use of synchrophasor measurement based tools and real-time thermal rating, to optimize the carrying capacity of existing and new transmission assets by providing better knowledge of the situation of the grid.” [EAC Recommendations for DOE Action on Non-Wires Solutions published on October 17, 2012 can be found here.](#)

The Department of Energy’s (DOE’s) National Energy Technology Laboratory (NETL), on behalf of the Office of Electricity (OE) and the Office of Energy Efficiency and Renewable Energy’s Wind Energy Technologies Office and Solar Energy Technologies Office, is seeking applications under this Funding Opportunity Announcement (Announcement) to conduct research, development, and demonstrations (RD&D) for innovative approaches that demonstrate real world benefits and usage of GETs.

This RD&D will lead to next generation GETs tools and technologies that are not widely available today to become broadly adopted throughout the energy sector. These technologies will help improve reliability, optimize utilization of infrastructure in existing rights of way, and facilitate renewable resource interconnection and market access by improving the reliability and efficiency of power transfer. Projects should also help advance technologies through demonstration and validation, after which, the GETs technologies should be ready for deployment type activities.

ii. Job Growth and Quality

Strengthening prosperity – by expanding good-paying, safe union jobs accessible to all workers and supporting job growth through investments in domestic supply chains – are key goals set by President Biden, discussed in depth in his Executive Orders (E.O.) on Ensuring the Future Is Made in All of America by All of America's Workers (E.O. 14005), Tackling the Climate Crisis at Home and Abroad (E.O. 14008), Worker Organizing and Empowerment (E.O. 14025), Boosting Quality of Federal Construction Contracts (E.O. 14063), and Promoting Competition in the American Economy (E.O. 14036).

In keeping with the administration’s goals, and as an agency whose mission includes strengthening our country’s energy prosperity, the DOE strongly supports investments that expand good-paying jobs that offer workers the free and fair choice to form, join, or assist a union, improve job quality through the adoption of strong labor standards and labor-management partnerships, and support responsible employers. The DOE also supports opportunities that foster safe, healthy, and inclusive workplaces and communities and strategies that develop a diverse workforce well-qualified to build and maintain the country’s energy infrastructure and grow domestic

manufacturing. Applicants to this FOA are encouraged to include information about how their project will support these goals.

iii. Diversity, Equity, Inclusion, and Accessibility

DOE strongly encourages efforts to reach historically underserved populations, racial minorities, and women. These strategies should create the connectivity and conditions for growth where they may not exist, such as in rural and underserved communities. A project's plan should articulate a strategy for sharing and maximizing the project's benefits across DACs and include a discussion of how resident, worker, and community leadership will be engaged throughout the project's duration.

It is the policy of the Biden Administration that:

[T]he Federal Government should pursue a comprehensive approach to advancing equity² for all, including people of color and others who have been historically underserved, marginalized, and adversely affected by persistent poverty and inequality. Affirmatively advancing equity, civil rights, racial justice, and equal opportunity is the responsibility of the whole of our Government. Because advancing equity requires a systematic approach to embedding fairness in decision-making processes, executive departments and agencies must recognize and work to redress inequities in their policies and programs that serve as barriers to equal opportunity.

By advancing equity across the Federal Government, we can create opportunities for the improvement of communities that have been historically underserved, which benefits everyone.³

As part of this whole of government approach, this FOA seeks to encourage the participation of underserved communities⁴ and underrepresented

² The term "equity" means the consistent and systematic fair, just, and impartial treatment of all individuals, including individuals who belong to underserved communities that have been historically denied such treatment, such as Black, Latino, and Indigenous and Native American persons, Asian Americans and Pacific Islanders and other persons of color; members of religious minorities; lesbian, gay, bisexual, transgender, and queer (LGBTQ+) persons; persons with disabilities; persons who live in rural areas; and persons otherwise adversely affected by persistent poverty or inequality. Executive Order 13985.

³ Executive Order 13985, "Advancing Racial Equity and Support for Underserved Communities Through the Federal Government" (Jan. 20, 2021).

⁴ The term "underserved communities" refers to populations sharing a particular characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life, as exemplified by the list of in the definition

groups, and deliver benefits to DACs. Applicants are highly encouraged to include individuals from groups historically underrepresented^{5,6} in STEM on their project teams. As part of the application, applicants are required to describe how diversity, equity, and inclusion objectives will be incorporated in the project. Specifically, applicants are required to submit a Diversity, Equity, and Inclusion (DEI) Plan that describes the actions the applicant will take to foster a welcoming and inclusive environment, support people from underrepresented groups in STEM, advance equity, and encourage the inclusion of individuals from these groups in the project; and the extent the project activities will be located in or benefit underserved communities. The concept proposal and outcomes should include historically excluded geographies, racial minorities, and women inclusive of letters of support from groups representing those communities. The plan should include at least one SMART (Specific, Measurable, Assignable, Realistic and Time-Related) milestone per budget period supported by metrics to measure the success of the proposed actions. This plan will be evaluated as part of the technical review process and incorporated into the award if selected.

of “equity.” E.O. 13985. For purposes of this FOA, as applicable to geographic communities, applicants can refer to economically distressed communities identified by the Internal Revenue Service as Qualified Opportunity Zones; communities identified as disadvantaged or underserved communities by their respective States; communities identified on the Index of Deep Disadvantage referenced at <https://news.umich.edu/new-index-ranks-americas-100-most-disadvantaged-communities/>, and communities that otherwise meet the definition of “underserved communities” stated above.

⁵ According to the National Science Foundation’s 2019 report titled, “Women, Minorities and Persons with Disabilities in Science and Engineering”, women, persons with disabilities, and underrepresented minority groups—blacks or African Americans, Hispanics or Latinos, and American Indians or Alaska Natives—are vastly underrepresented in the STEM (science, technology, engineering and math) fields that drive the energy sector. That is, their representation in STEM education and STEM employment is smaller than their representation in the U.S. population.

<https://nces.nsf.gov/pubs/nsf19304/digest/about-this-report> For example, in the U.S., Hispanics, African Americans and American Indians or Alaska Natives make up 24 percent of the overall workforce, yet only account for 9 percent of the country’s science and engineering workforce. DOE seeks to inspire underrepresented Americans to pursue careers in energy and support their advancement into leadership positions. <https://www.energy.gov/articles/introducing-minorities-energy-initiative>

⁶ See also. Note that Congress recognized in section 305 of the American Innovation and Competitiveness Act of 2017, Public Law 114-329:

(1) [I]t is critical to our Nation’s economic leadership and global competitiveness that the United States educate, train, and retain more scientists, engineers, and computer scientists; (2) there is currently a disconnect between the availability of and growing demand for STEM-skilled workers; (3) historically, underrepresented populations are the largest untapped STEM talent pools in the United States; and (4) given the shifting demographic landscape, the United States should encourage full participation of individuals from underrepresented populations in STEM fields.

Further, Minority Serving Institutions⁷, Minority Business Enterprises, Minority Owned Businesses, Woman Owned Businesses, Veteran Owned Businesses, or entities located in an underserved community that meet the eligibility requirements (See Section III.) are encouraged to apply as the prime applicant or participate on an application as a proposed partner to the prime applicant. The Selection Official may consider the inclusion of these types of entities as part of the selection decision.

iv. Justice40 Initiative

In addition to the Federal government's initiative to achieve greater participation from underserved communities and underrepresented groups, 40% of the overall benefits under this FOA should flow to DACs to support DOE's commitment to the Justice40 Initiative.⁸ Benefits include (but are not limited to) measurable direct or indirect investments or positive project outcomes that achieve or contribute to the following in DACs: (1) a decrease in energy burden; (2) a decrease in environmental exposure and burdens; (3) an increase in access to low-cost capital; (4) an increase in job creation, the clean energy job pipeline, and job training for individuals; (5) increases in clean energy enterprise creation and contracting (e.g., minority-owned or diverse business enterprises); (6) increases in energy democracy, including community ownership; (7) increased parity in clean energy technology access and adoption; and (8) an increase in energy resilience.

Executive Order 14008 states that:

- (Sec 219) "Agencies shall make achieving environmental justice part of their missions by developing programs, policies, and activities to address the disproportionately high and adverse human health, environmental, climate-related and other cumulative impacts on disadvantaged communities, as well as the accompanying economic challenges of such impacts."

⁷ Minority Serving Institutions (MSIs), including Historically Black Colleges and Universities/Other Minority Institutions as educational entities recognized by the Office of Civil Rights (OCR), U.S. Department of Education, and identified on the OCR's Department of Education U.S. accredited postsecondary minorities' institution list. See <https://www2.ed.gov/about/offices/list/ocr/edlite-minorityinst.html>.

⁸ The Justice40 initiative, created by E.O. 14008, establishes a goal that 40% of the overall benefits of certain federal investments flow to (DACs). The Justice40 Interim Guidance provides a broad definition of DACs (Page 2): <https://www.whitehouse.gov/wp-content/uploads/2021/07/M-21-28.pdf>. The DOE, OMB, and/or the Federal Council for Environmental Quality (CEQ) may issue additional and subsequent guidance regarding the designation of DACs and recognized benefits under the Justice40 Initiative.

- (Sec 223; Justice40 Initiative) “Within 120 days of the date of this order, the Chair of the Council on Environmental Quality, the Director of the Office of Management and Budget, and the National Climate Advisor, in consultation with the Advisory Council, shall jointly publish recommendations on how certain Federal investments might be made toward a goal that 40 percent of the overall benefits flow to disadvantaged communities. The recommendations shall focus on investments in the areas of clean energy and energy efficiency; clean transit; affordable and sustainable housing; training and workforce development; the remediation and reduction of legacy pollution; and the development of critical clean water infrastructure.”

To support the Justice40 (J40) Initiative financial assistance awards must be associated with a J40 category. Awards made under this AOI will be most applicable to the category check marked below.

- ☐ Affordable and Sustainable Housing
- ☐ Clean Energy and Energy Efficiency
- ☐ Clean Transportation
- ☐ Climate Change
- ☐ Critical Clean Water and Waste Infrastructure
- ☐ Remediation and Reduction of Legacy Pollution
- ☐ Training and Workforce Development
- ☒ Non-J40
- ☐ To be determined (i.e., the AOI scope is too indefinite to determine which category will be applicable, thus the J40 category will be determined after the specific project is selected for negotiation for award)

C. Objectives/Topic Areas

The objective of this FOA is to address the findings of the 2022 DOE Report “Grid Enhancing Technologies: A Case Study on Ratepayer Impact”. Specifically, the FOA aims to fill gaps in information on the real-world benefits and usage of GETs through at-scale field demonstrations. The impact of GETs technologies like Dynamic Line Rating (DLR) and Power Flow Controllers (PFC) is highly location-dependent, and so demonstrations across a variety of systems differing in scale, geography, topology, and connected renewable generation resources would be useful in determining important aspects for the location specific impact of GETs.

Projects must include both DLR and PFC demonstration. For the purposes of this FOA, the definition of these two technologies are as follows:

- [Dynamic Line Rating \(DLR\)](#) – Hardware and/or software used to appropriately update the calculated thermal limits of existing transmission lines based on real-time and forecasted weather conditions. In most cases, these schemes establish new limits that safely allow more energy transfer across existing infrastructure. This could be as simple as utilizing existing line measurements and incorporating forecasted weather conditions to continually update the calculation of line thermal ratings. More advanced methods could include utilization of advanced grid sensors and real-time weather data.
- [Power Flow Controllers \(PFC\)](#) – Hardware and software used to push or pull power, helping to balance overloaded lines and underutilized corridors within the transmission network. Power flow controllers (PFCs) are a family of technologies that can actively change the way power flows through the transmission system without making changes to generator dispatch or the topology of the network. The AC power flowing on a given transmission line is driven by four key parameters based on physics of the power system: the voltage on each end of the line, the reactance of the line, and the voltage phase angle difference between both ends. AC PFCs operate by adjusting one or more of these parameters.

The bulk of the demonstrations should be on DLR and PFC, but projects are not limited to only these two GETs. The holistic operation of an advanced and modern grid would include the GETs to be studied here (PFCs and DLR) along with Dynamic Transformer Rating (DTR), equipment asset monitoring for active management, and energy storage. Multiple GETs technologies, both networks of the same GETs technologies and of different GETs technologies working in concert, are encouraged as part of these demonstrations. Finally, utilization of advanced sensors for better data, analysis, and methods for system observability are important components of GETs solutions, and thus relevant data analysis tool development and demonstration is also encouraged.

The focus of the demonstrations should be on transmission systems, however projects that include both transmission and distribution GETs, and explore coordinated planning and operation across these boundaries, are encouraged.

There is only one topic area in this FOA: **Grid Enhancing Technologies Demonstration at Scale.**

This topic area seeks applications to carry out Research and Development (R&D) and Demonstration activities to support the following FOA objectives:

- Demonstrate how DLR and/or PFC at scale can improve infrastructure utilization and reliability.
- Demonstrate how GETs can impact integration of renewable energy, particularly demonstration of potentially synergistic technologies (e.g. wind with DLR, or helping facilitate solar integration by reducing congestion).
- Demonstrate methodologies and procedures for integrating grid GETs (such as DLRs and PFCs at a minimum) at scale into utility operations to improve efficiency, utilization, and reliability of existing infrastructure.
- Assess the performance of GETs in the field and the reliability of such options in utility-specific resource planning; the assessment should include how GETs relate to the full set of solutions (storage, DTR, etc.) alongside traditional upgrades.
- Develop understanding of how GETs can be integrated into protection planning.
- Develop understanding of communication and network requirements and/or specifications for different GETs.
- Develop new tools and/or enhance existing operational tools to improve the reliability and response time for power line hosting capacity mapping.
- Collect sharable data in respect to the cost and installation of the GETs through the installation and demonstration so that the benefits can be quantified, and data can be accessed by industry.
- Understand how GETs can support the market mechanism of generation dispatch.
- Demonstrate how GETs has a financial impact on the reduction of energy cost and avoided costs.

This FOA aims to accelerate development and demonstrations of GETs technologies, specifically DLR and PFC, so the technologies are ready for wide deployment. GETs technologies RD&D address challenges associated with:

- Reliability, through improved operation and observability of grid conditions
- Environment and Equity, through optimized utilization of existing rights of way
- Decarbonization, through improved integration of renewable resources

The impact of GETs technologies such as DLRs and PFCs is highly location-dependent, and so demonstrations across a variety of system scale, geography, and topology will be useful in determining important aspects for the location specific impact of GETs.

Information sought for each demonstration includes, but is not limited to:

- Budgetary Cost Estimates, both in terms of time and money for the demonstration
- Hour by Hour Usage and operation metrics

- Information on impact of the GETs technology on system reliability, such as increases in line capacity utilization, thermal violation identification, and other relevant metrics.
- Deployment Challenges including environmental, permitting, construction, etc.
- Workforce/Business Development, including required training, operational procedures for GETs

Applications should include how the project will address the holistic integration of grid enhancing technologies into system planning, this includes but is not limited to:

- Study of quantitative and qualitative impact of GETs on system efficiency, reliability, and affordability for the demonstration.
- Plan for coordination among regional planning institutions, at Federal, state, and/or tribal level.
- Methods for identification of the optimal GETs solution set, which should include all commercially available alternatives including storage and potentially DTR.
- Demonstrations should evaluate the full set of solutions (DTR, storage, etc.) alongside traditional upgrades. This evaluation should show how GETs can serve as an alternative and reduce needs for new transmission. The bulk of the demonstration should be on DLR and PFC. While these two should be the focus of the demonstrations other GETs are not excluded. The holistic operation of an advanced and modern grid would include the GETs to be studied here (PFCs and DLR) along with DTR, and energy storage.
- Projects study of how GETs can be integrated into planning at different levels:
 - Within a specific service territory
 - Across service territory boundaries and
 - Inter-regional planning

Applications should also include how the project will address the integrated grid enhancing technologies into operations, including but not limited to:

- Procedures for operations during normal conditions
- Stress testing of the GETs technologies to inform operations during extreme weather and emergency conditions.
- Understanding how GETs operational impacts could impact market dispatching mechanisms. For example, generation injection time delays from DLR could potentially change the dispatching order.
- Any equipment installation requirement, estimated schedule, as well as any supply chain challenges and its mitigation plan.

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 Responsiveness Criteria):

- Submissions for proposed technologies that are not based on sound scientific principles (e.g., violates the laws of thermodynamics).
- Submission with the advanced conductor solution to improve infrastructure utilization and reliability. This is an AOI under subtopic 1.1 of EERE FOA DE-FOA-0002864.
- Submissions with demonstration conducted at a national laboratory or using hardware-in-the-loop (HIL). Demonstrations should be conducted in the field at transmission or distribution electricity utilities, or system operators.

II. Award Information

A. Type of Application

DOE will accept only new applications under this announcement.

B. Type of Award Instrument

DOE anticipates awarding cooperative agreements under this funding opportunity announcement (See Section VI Statement of Substantial Involvement).

C. Award Overview

i. Estimated Funding, Number of Awards, and Award Size

DOE anticipates selecting no more than five awards with a single, coextensive budget period.

Project continuation into the demonstration portion 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. Each project should start demonstration portions of the work no later than the beginning of year two of the effort.

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

Estimated Federal Funding	Anticipated No. of Awards	Anticipated Individual Award Size					
		DOE Share (R&D) \$/%	Cost Share (R&D) \$/%	DOE Share (Demo) \$/%	Cost Share (Demo) \$/%	Total \$	Maximum DOE Share of Award
\$6.5M	3 to 5	up to \$700,000/ 80%	up to \$200,000/ 20%	up to \$1,400,000/ 50%	up to \$1,400,000/ 50%	up to \$4,000,000	\$2,100,000

APPLICATIONS WHICH EXCEED THE “MAXIMUM DOE SHARE OF AWARD” SPECIFIED ABOVE WILL BE CONSIDERED NONCOMPLIANT (SEE SECTION III COMPLIANCE CRITERIA). DOE WILL NOT REVIEW OR CONSIDER NONCOMPLIANT APPLICATIONS.

ii. Estimated Project Period of Performance

DOE anticipates making awards with an estimated project period of performance not to exceed three years.

III. Eligibility Information

A. General

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

B. Eligible Applicants

i. Individuals

U.S. citizens and lawful permanent residents are eligible to apply for funding as a Prime Recipient or Subrecipient.

ii. Domestic Entities

For-profit entities, educational institutions, and nonprofits that are incorporated (or otherwise formed) under the laws of a particular State or territory of the United States are eligible to apply for funding as a Prime Recipient or Subrecipient.

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.**

iii. Domestic Public Entities (excluding Federal entities)

State, local, and tribal government entities are eligible to apply for funding as a Prime Recipient or Subrecipient.

Federal entity eligibility is discussed below.

iv. Federally Funded Research and Development Centers and National Laboratories

DOE/National Nuclear Security Administration (NNSA) Federally Funded Research and Development Centers (FFRDCs) and National Laboratories (NL) are eligible to apply for funding as a Subrecipient (only) but are not eligible to apply as a Prime Recipient. Non-DOE/NNSA FFRDCs and National

Laboratories 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.

Authorization. The cognizant contracting officer for the DOE/NNSA FFRDC/NL or the non-DOE/NNSA Federal agency sponsoring the FFRDC/NL contractor must authorize in writing the use of the FFRDC/NL on the proposed project and this authorization must be submitted with the application. The use of a FFRDC/NL must be consistent with its authority under its award and will not place the laboratory in direct competition with the domestic private sector.

The following wording is acceptable for this authorization:

"Authorization is granted for the [Name] Laboratory to participate in the proposed project. The work proposed for the laboratory is consistent with or complimentary to the missions of the laboratory, will not adversely impact execution of the [DOE/NNSA/or FEDERAL AGENCY] assigned programs at the laboratory, and will not place the laboratory in direct competition with the domestic private sector."

Value/Funding. The value of, and funding for, the FFRDC/NL portion of the work will be included in the award to a successful applicant. DOE/NNSA will not fund a DOE/NNSA FFRDC/NL through the DOE field work authorization process and other FFRDC/NLs through an interagency agreement with the sponsoring agency. FFRDCs/NLs will be treated as subawards for applicants. Therefore, the prime recipient and FFRDC are responsible for entering into an appropriate subaward that will govern, among other things, the funding of the FFRDC portion of the work from the prime recipient under its DOE award. Such an agreement must be entered into before any project work begins.

Cost Share. The applicant's cost share requirement will be based on the total cost of the project, including the applicant's and the FFRDC/NL's portions of the effort.

FFRDC/NL Effort as a Subrecipient. The scope of work to be performed by the FFRDC/NL may not be more significant than the scope of work to be performed by the applicant. The FFRDC/NL's effort, in aggregate, shall not

exceed 10% of the total estimated cost of the project, including the DOE share, applicant share and the FFRDC/NL's portions of the effort.

Responsibility. The applicant, if successful, will be the responsible authority regarding the settlement and satisfaction of all contractual and administrative issues, including but not limited to, disputes and claims arising out of any agreement between the applicant and the FFRDC/NL.

v. Federal Entities

Federal agencies and instrumentalities (other than DOE) are eligible to apply for funding as a Subrecipient but are not eligible to apply as a Prime Recipient.

vi. Foreign Entities

Foreign entities, whether for-profit or otherwise, are eligible to apply for funding as a Prime Recipient or Subrecipient under this FOA. Other than as provided in the “Individuals” or “Domestic Entities” sections above, all Prime Recipients receiving funding under this FOA must be incorporated (or otherwise formed) under the laws of a State or territory of the United States. If a foreign entity applies for funding as a Prime Recipient, it must designate in the Full Application a subsidiary or affiliate incorporated (or otherwise formed) under the laws of a State or territory of the United States to be the Prime Recipient. The Full Application must state the nature of the corporate relationship between the foreign entity and domestic subsidiary or affiliate.

Foreign entities may request a waiver of the requirement to designate a subsidiary in the United States as the Prime Recipient in the Full Application (i.e., a foreign entity may request that it remains the Prime Recipient on an award). To do so, the Applicant must submit an explicit written waiver request in the Full Application. The Appendix lists the necessary information that must be included in a request to waive this requirement. The applicant does not have the right to appeal DOE’s decision concerning a waiver request.

In the waiver request, the applicant 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 have a foreign entity serve as the Prime Recipient. DOE may require additional information before considering the waiver request.

vii. Incorporated Consortia

Incorporated consortia, which may include domestic and/or foreign entities, are eligible to apply for funding as a Prime Recipient or Subrecipient. For consortia incorporated (or otherwise formed) under the laws of a State or territory of the United States, please refer to “Domestic Entities” above. For consortia incorporated in foreign countries, please refer to the requirements in “Foreign Entities” above.

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

viii. Unincorporated Consortia

Unincorporated Consortia, which may include domestic and foreign entities, must designate one member of the consortium to serve as the Prime Recipient/consortium representative. The Prime Recipient/consortium representative must be incorporated (or otherwise formed) under the laws of a State or territory of the United States. The eligibility of the consortium will be determined by the eligibility of the Prime Recipient/consortium representative under Section III of the FOA.

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

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

C. Cost Sharing

i. Cost Share Requirements

The cost share must be at least 20% of the total allowable costs for research and development activities and 50% of the total allowable costs for demonstration activities 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.)

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 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.

To assist applicants in calculating proper cost share amounts, DOE has included a cost share information sheet and sample cost share calculation in an Appendix to this FOA.

ii. 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.

iii. 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.

iv. Cost Share Types and Allowability

Every cost share contribution must be allowable under the applicable Federal cost principles, as described in Section IV Funding Restrictions. In addition, cost share must be verifiable upon submission of the Full Application.

Project Teams may provide cost share in the form of cash or in-kind contributions. 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 the funding was not provided to the state or local government by the Federal Government.

The Prime 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 Appendix A of the FOA.

v. 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 Appendix A of the FOA.

vi. 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.

D. 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 and Full Applications

Concept Papers. Concept Papers are deemed compliant if:

- The Concept Paper complies with the content and form requirements in Section IV.A and IV.B of the FOA; and
- The applicant successfully emailed all required documents to FOA2948@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.C of the FOA;
- The Full Application complies with the content and form requirements in Section IV.A and IV.C 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.

E. 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 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/Topic Areas” contained in Section I.C 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.

F. Number of Submittals Eligible for Review

Applicants may submit *more than* one Full Application to this FOA. Each application must describe a unique, scientifically distinct project.

G. 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

A. 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 inch 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**. 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.A of the FOA.

B. 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_CP.pdf".

Concept Papers must be submitted via email to FOA2948@netl.doe.gov. The subject line of the e-mail MUST read as follows "Concept Paper FOA 2948". 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.A 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 of the FOA).

Each Concept Paper must be limited to a single concept or technology. Unrelated concepts and technologies 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	1 page maximum	The cover page should include the project title, both the technical and business points of contact, names of all team member organizations (and whether the organization is a minority serving institution), the anticipated asset owner/operator site for demonstration (and relevant service territory), and any statements regarding confidentiality. ~~A sample Concept Paper Cover Page is included as an attachment to this announcement.~~
Technology Description	2.5 pages maximum	Applicants are required to describe succinctly: • The proposed GETs demonstration, including how the technology is unique and innovative, and how it can help integration of renewable energy and decarbonization efforts, and how the demonstration may impact the relevant community; • 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; • The potential impact that the proposed project would have on developing the proposed technology for the relevant field and application; • The key technical risks/issues associated with the proposed technology development plan and installation; and • Estimated project cost and impact that funding would have on the proposed project.
Project Team/Addendum	1.5 pages maximum	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.
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*As indicated above, maximum page limits have been established for each section of the concept paper (inclusive of references inserted as footnotes and/or endnotes) and when totaled together should not exceed 5 pages.

C. 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 of the FOA).

Each Full Application shall be limited to a **single** concept or technology. Unrelated concepts and technologies shall not be consolidated in 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. anIFFRDC or lincolnFFRDC.pdf)
	Environmental Questionnaire	PDF	Env.pdf
	Cost Share Commitment Letter, if applicable	PDF	CSCL.pdf
	SF-LLL Disclosure of Lobbying Activities, if applicable	Form	N/A
	Foreign Entity Participation waiver request, if applicable	PDF	FN_Waiver.pdf
	Performance of Work in the United States waiver request, if applicable	PDF	PerformanceofWork_Waiver.pdf
	Domestic Content Procurement Preference for Buy American Requirement for Infrastructure Projects waiver request, if applicable	PDF	DomesticContent_Waiver.pdf
	Data Management Plan	PDF	DMP.pdf
	Diversity, Equity, Inclusion, and Accessibility Plan	PDF	DEIAP.pdf
	Current and Pending Support	PDF	CPS.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. 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 25 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 inch 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 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. 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.
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.A. 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 5 pages in total for the proposed work. Applicants shall prepare the Statement

		of Project Objectives in the format provided in an Appendix 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 the following: • How can the proposed GETs demonstration, including how the technology is unique and innovative, help integration of renewable energy and decarbonization efforts; • How can the demonstration impact the relevant community; • How can the proposed technology overcome the shortcomings, limitations, and challenges in the relevant field and application; • The potential impact that the proposed project would have on developing the proposed technology for the relevant field and application. It should also include the key technical risks/issues associated with the proposed technology development plan and installation.
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	<u>Not</u> 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	<u>Not</u> 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 Compliance Criteria). DOE will not review or consider noncompliant submissions.

vii. Project Summary for Public Release File

The project summary/abstract must contain a summary of the proposed activity suitable for dissemination to the public. It should be a self-contained document that identifies the name of the applicant, the project director/principal investigator(s), the project title, the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (i.e., benefits, outcomes), and 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 if an award is made. 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 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 an Appendix of the FOA. Save this information in a file named "PMP.pdf," and click on "Add Optional Other Attachment" to attach.

ix. Resume File

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. Save all resumes in a single file named "Resume.pdf" and click on "Add Optional Other Attachment" to attach. The biographical information for each resume must not exceed 2 pages when printed on 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right) **single** spaced with font no smaller than 11 point and should include the following information, if applicable:

- Education and Training. Undergraduate, graduate and postdoctoral training, provide institution, major/area, degree and year.
- Research and Professional Experience. Beginning with the current position list, in chronological order, professional/academic positions with a brief description.
- Publications. Provide a list of up to 10 publications most closely related to the proposed project. For each publication, identify the names of all authors (in the same sequence in which they appear in the publication), the article title, book or journal title, volume number, page numbers, year of publication, and website address if available electronically.
- Patents, copyrights, and software systems developed may be provided in addition to or substituted for publications.

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

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 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, vendor quotes). Applicants should include costs associated with required annual audits and incurred cost proposals in their proposed budget documents.

A Budget Justification workbook is included as an attachment to this announcement for use and to describe the level of detail required in the budget justification. Although the data requested is mandatory, the use of the budget justification workbook is not.

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.

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 \$100,000 or 50 percent 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 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 \$100,000 or 50 percent 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 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., lanIFFRDC.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. 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."

xviii. Waiver Requests: Foreign Entity Participation, Performance of Work in the United States, and Domestic Content Procurement Preference for Buy American Requirement for Infrastructure Projects

(a) Foreign Entity Participation:

As set forth in Section III, all Prime Recipients receiving funding under this FOA must be incorporated (or otherwise formed) under the laws of a State or territory of the United States. To request a waiver of this requirement, the applicant must submit an explicit waiver request in the Full Application. See Appendix for a list of the necessary information that must be included in a request to waive this requirement. Save the waiver request(s) in a single PDF file titled "FN_Waiver" and click on "Add Optional Other Attachment" to attach.

(b) Performance of Work in the United States

There may be limited circumstances where it is in the interest of the project to perform a portion of the work outside the United States. To seek a waiver of the Performance of Work in the United States requirement, the applicant must submit a written waiver request to DOE. See Appendix for a list of the necessary information that must be included in a request to waive the Performance of Work in the United States requirement.

The applicant must demonstrate to the satisfaction of DOE that a waiver would further the purposes of the FOA and is in the economic interests of the United States. DOE may require additional information before considering a waiver request. Save the waiver request(s) in a single PDF file titled "PerformanceofWork_Waiver" and click on "Add Optional Other Attachment" to attach. The applicant does not have the right to appeal DOE's decision concerning a waiver request.

(c) Domestic Content Procurement Preference for Buy American Requirement for Infrastructure Projects:

As set forth in Section IV.N., all of the iron, steel, manufactured products and construction materials used in the infrastructure activities of the project must be produced in the United States. Appendix B lists the necessary information that must be included in an Domestic Content Procurement Preference for Buy American Requirement for Infrastructure Projects waiver request. Save the waiver request(s) in a single PDF file titled "DomesticContent_Waiver" and click on "Add Optional Other Attachment" to attach. The applicant does not have the right to appeal DOE's decision concerning a waiver request.

xix. Data Management Plan

Applicants are required to submit a Data Management Plan (DMP) as part of their Full Application.

An applicant may select one of the template Data Management Plans (DMP) listed below. Alternatively, instead of selecting one of the template DMPs below, an applicant may submit another DMP provided that the DMP, at a minimum, (1) describes how data sharing and preservation will enable validation of the results from the proposed work, how the results could be validated if data are not shared or preserved and (2) has a plan for making all research data displayed in publications resulting from the proposed work

digitally accessible at the time of publications. DOE Public Access Plan dated July 24, 2014 provides additional guidance and information on DMPs.

Option 1 (for when protected data is allowed): For the deliverables under the award, the recipient does not plan on making the underlying research data supporting the findings in the deliverables publicly available for up to five (5) years after the data were first produced because such data will be considered protected under the award. The results from the DOE deliverables can be validated by DOE who will have access, upon request, to the research data. Other than providing deliverables as specified in the award, the recipient does not intend to publish the results from the project. However, in an instance where a publication includes results of the project, the underlying research data will be made available according to the policies of the publishing media. Where no such policy exists, the recipient must indicate on the publication a means for requesting and digitally obtaining the underlying research data. This includes the research data necessary to validate any results, conclusions, charts, figures, images in the publications.

Option 2: For any publication that includes results of the project, the underlying research data will be made available according to the policies of the publishing media. Where no such policy exists, the recipient must indicate on the publication a means for requesting and digitally obtaining the underlying research data. This includes the research data necessary to validate any results, conclusions, charts, figures, images in the publications.

Save this plan in a single file named "DMP.pdf".

xx. Diversity, Equity, Inclusion, and Accessibility Plan

As part of the application, applicants are required to describe how diversity, equity, and inclusion objectives will be incorporated in the project. Specifically, applicants are required to submit a Diversity, Equity, and Inclusion Plan that describes the actions the applicant will take to foster a welcoming and inclusive environment, support people from groups underrepresented in STEM, advance equity, and encourage the inclusion of individuals from these groups in the project; and the extent the project activities will be located in or benefit underserved communities (also see Section I.A.iii.). The plan should include at least one SMART milestone per Budget Period supported by metrics to measure the success of the proposed actions and will be incorporated into the award if selected. The Diversity, Equity, and Inclusion Plan should contain the following information:

- Equity Impacts: the impacts of the proposed project on DACs, including social and environmental impacts.
- Benefits: The overall benefits of the proposed project, if funded, to underserved communities; and
- How diversity, equity, and inclusion objectives will be incorporated in the project.

The following is a non-exhaustive list of actions that can serve as examples of ways the proposed project could incorporate diversity, equity, and inclusion elements. This non-exhaustive list of actions must be made in a non-discriminatory manner without superseding merit selection principles. These examples should not be considered either comprehensive or prescriptive. Applicants may include appropriate actions not covered by these examples.

- a) Include persons from groups underrepresented in STEM as PI, co-PI, and/or other senior personnel;
- b) Include persons from groups underrepresented in STEM as student researchers or post-doctoral researchers;
- c) Include faculty or students from Minority Serving Institutions as PI/co-PI, senior personnel, and/or student researchers, as applicable;
- d) Enhance or collaborate with existing diversity programs at your home organization and/or nearby organizations;
- e) Collaborate with students, researchers, and staff in Minority Serving Institutions;
- f) Disseminate results of research and development in Minority Serving Institutions or other appropriate institutions serving underserved communities;
- g) Implement evidence-based, diversity-focused education programs (such as implicit bias training for staff) in your organization;
- h) Identify Minority Business Enterprises, Minority Owned Businesses, Woman Owned Businesses and Veteran Owned Businesses to solicit as vendors and sub-contractors for bids on supplies, services, and equipment.
- i) Partnerships with workforce intermediaries (community colleges, etc), labor, non-profits, or community-based organizations;
- j) An effort to engage with anchor institutions to develop a sector-based approach to job training and support.

The Diversity, Equity, Inclusion, and Accessibility Plan must not exceed 5 pages. Save this plan in a single file named 'DEIAP.pdf' and click on "Add Optional Other Attachment" to attach."

xxi. Current and Pending Support

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 – end date)
- 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.

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. 3729-3730 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 format approved by the National Science Foundation (NSF), which 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://www.nsf.gov/bfa/dias/policy/nsfapprovedformats/cps.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. 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.

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 recognize in some

appropriate manner, e.g., alternative binding commitments to provide an overall net benefit of the U.S. economy. The Recipient agrees that it will not license, assign or otherwise 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.F. Intellectual Property Developed Under This Program of this FOA for more information on the DEC and DOE Patent Waiver.

D. Post Selection Information Requests

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

- Personnel proposed to work on the project and collaborating organizations (See Section VIII.U. Participants and Collaborating Organizations)
- Current and Pending Support (See Section VIII.V. 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 Involvement

E. Submission Dates and Times

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.**

F. Intergovernmental Review

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

G. 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 Paper Submission

Concept Papers must be submitted via e-mail to FOA2948@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 the applicant 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.

H. Funding Restrictions

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

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. The cost principles for commercial organizations/for-profit entities are in FAR Part 31.

I. 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.

J. 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.

K. Performance of Work in the United States

The Recipient agrees that at least **100** percent of the direct labor cost for the project (including subrecipient labor) shall be incurred in the United States, unless the Recipient can demonstrate to the satisfaction of the Department of Energy that the United States economic interest will be better served through a greater percentage of the work being performed outside of the United States.

Applicants and prime recipients may request a waiver of this requirement. Applicants must include a written waiver request in the Full Application. Prime recipients must submit any waiver requests in writing to the DOE Contracting Officer for this FOA. The DOE Contracting Officer has discretion to waive this requirement if he/she determines that it will further the purposes of this FOA and is otherwise in the best interest of the Government. If you would like to request a waiver see Full Application Package in Section IV and Appendix.

L. Foreign Travel

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

M. Equipment and Supplies

To the greatest extent practicable, all equipment and supplies purchased with funds made available under this FOA should be American made. This requirement does not apply to used or leased equipment.

Property disposition will 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.

N. Domestic Preference Standard Buy American Requirement

As appropriate and to the extent consistent with law, Applicants shall ensure that, to the greatest extent practicable, iron and aluminum as well as steel, cement, and other manufactured products (construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber) used in the proposed project shall be produced in the United States. This requirement shall flow down to all sub-awards including all contracts, subcontracts and purchase orders for work performed under the proposed project.

Refer to Build America Buy America executive order:

<https://www.whitehouse.gov/wp-content/uploads/2022/04/M-22-11.pdf>.

For infrastructure projects, Section IV.J.viii Domestic Content Procurement Preference for Buy American Requirement for Infrastructure Projects overrides this section.

O. Domestic Content Procurement Preference for Buy American Requirement for Infrastructure Projects

Refer to Build America Buy America executive order:

<https://www.whitehouse.gov/wp-content/uploads/2022/04/M-22-11.pdf>.

None of the project funds or otherwise made available under an award may be used under 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 (construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber) 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 are manufactured in the United States. This means that all manufacturing processes for the construction material occurred in the United States.

This requirement shall flow down to all sub-awards including all contracts, subcontracts and purchase orders for work performed under the proposed project.

When necessary, recipients may request, and DOE may grant a waiver of the application of the Domestic Content Procurement Preference for Buy American Requirement for Infrastructure Projects requirements in any case in which DOE has made a determination that one of the following exceptions apply— (1) applying the

domestic content procurement preference would be inconsistent with the public interest; (2) 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.

A request to waive the application of the domestic content procurement preference must be provided by the recipient in writing to DOE. See Appendix C for instructions on the format, contents, and supporting materials required for any waiver request. Waiver requests may be subject to public comment periods of no less than 15 days, after which the request must also be reviewed by OMB.

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; 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.

Merit Review Criterion 1: Scientific and Technical Merit (30%)

- Proposed technology is clearly identified.
- Proposed Technology aligns with the stated objectives of the FOA and the proposal/application specifically addresses how the demonstrated GETs will be ready for wide deployment through demonstration and data collection of associated benefits.
- Applicant presents a feasible approach to achieving the objectives of the FOA, and likelihood of success in the demonstration.
- Application contains a clear rationale for the proposed R&D which discusses its novelty and explains why the technology must be developed now in the context of existing technologies.
- Feasibility of the proposed concept; the degree to which the proposed work is grounded in scientific methods and engineering principles.
- The degree to which the proposed activities advance the state-of-the-art in the field.
- The extent the proposed GETs demonstration will help accelerate equitable decarbonization of the grid.

Merit Review Criterion 2: Significance, Impact and Community Benefits (40%)

- A clear statement of the broader positive impacts of the proposed work.
- Extent to which the applicant demonstrates community and labor engagement to date and/or a clear and appropriately robust plan to engage local stakeholders, including labor unions and community-based organizations that support or work with disadvantaged communities.
- Extent the project includes analysis, technology development, and/or engagement efforts that address community desires and/or concerns which go above and beyond the requirements for technical, analytical, performance or regulatory compliance.
- Identification of the key technical risk areas and the quality of the mitigation strategies to address them, for example, with potential supply chain and installation timing.
- Level of commitment of the project team during project performance and post-project adoption of the proposed methodology and/or technology solution.
- Likelihood that the project will result in improved understanding of public benefits and costs related to the innovation if successful.
- Extent to which the proposed project will impact workforce considerations, such as, providing workforce opportunities in low and moderate-income communities or communities that have lost jobs due to fossil energy displacement.

Merit Review Criterion 3: Technical and Management Capabilities (20%)

- Demonstrated experience and likely effectiveness of the applicant and partnering organizations in the technology areas addressed in the application and in managing projects of similar size, scope, and complexity.
- The adequacy and completeness of the Project Management Plan (PMP) in establishing baselines (technical scope, budget, schedule) and in managing project performance relative to those baselines; defining the actions that will be taken when these baselines must be revised; and identification of project risks and strategies for mitigation.
- The reasonableness of the budget, spend plan for the proposed work as well as the timelines for the proposed activities.
- Clear workplan tasks, staffing, research, and timeline for engaging energy equity stakeholders and/or evaluating the possible near and long-term implications of the project for the benefit of the American public, including, but not limited to the public health and public prosperity benefits
- A clear approach to documenting requirements in the PMP, with information that can be used to measure whether the demonstration successfully advanced GETs and explored coordinated system planning; Identification of the key metrics of success and a proposed assessment plan for tracking them.

Merit Review Criterion 4: Team and Resources (10%)

- Adequacy and appropriateness of the qualifications, expertise, and experience of key personnel and team members. Demonstrated capabilities and experience of the collaboration in multi-disciplinary research.
- Adequacy, appropriateness, and availability of proposed facilities and equipment to perform project tasks.
- 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.
- Demonstration site and associated organizations availability, appropriateness, adequacy of scale, condition of facilities, and environment for utilizing and demonstrating GETs.
- Clear articulation of the projects impact related to diversity, equity, inclusion, and accessibility of the GETS technology. Extent to which impacted communities are appropriately included as core partners in the project and/or affirm support.
- Relationships with stakeholders (such as operating or regulatory entities) that will be leveraged during the project as demonstrated by past agreements or letters of prospective support.

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. For example, it may be desirable to select a project, or group of projects, that exhibit team member diversity, with participants including but not limited to those from MSIs (e.g. HBCUs/OMIs)⁹.
- 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).
- It may be desirable to select an entity located in an urban and economically distressed area including a Qualified Opportunity Zone (QOZ) or to select a project, or group of projects, if the proposed project(s) will occur in a QOZ or otherwise advance the goals of a QOZ, including spurring economic development and job creation in distressed communities throughout the United States.

⁹ Minority Serving Institutions (MSIs), including HBCUs/OMIs as educational entities recognized by the Office of Civil Rights (OCR), U.S. Department of Education, and identified on the OCR's Department of Education U.S. accredited postsecondary minorities' institution list. See <https://www2.ed.gov/about/offices/list/ocr/edlite-minorityinst.html>.

- The degree to which the proposed project maximizes benefits to DACs.
- The degree to which the proposed project minimizes environmental impacts to DACs.

C. Other Review Requirements

i. Risk Assessment

Prior to making a Federal award, the DOE is required by 31 U.S.C. 3321 and 41 U.S.C. 2313 to review information available through any OMB-designated repositories of government-wide eligibility qualification or financial integrity information, such as SAM Exclusions and “Do Not Pay.”

In addition, DOE evaluates the risk(s) posed by applicants before they receive Federal awards. This evaluation may consider: results of the evaluation of the applicant's eligibility; the quality of the application; financial stability; quality of management systems and ability to meet the management standards prescribed in this part; history of performance; reports and findings from audits; and the applicant's ability to effectively implement statutory, regulatory, or other requirements imposed on non-Federal entities.

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.

ii. Reporting Matters Related to Recipient Integrity and Performance

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

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

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

D. 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 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 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

i. 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>.

ii. System for Award Management and Unique Entity Identifier Requirements (November 2021)

Applicants that do not have an exemption under [2 CFR 25.110](#) must:

- 1) Be registered in the System for Award Management (SAM) at <https://www.sam.gov> prior to submitting an application or plan;
- 2) Provide its unique entity identifier in each application or plan it submits to DOE;
- 3) Maintain an active SAM registration with current information, including information on a its immediate and highest-level owner and subsidiaries, as well as on all predecessors that have been awarded a Federal contract or financial assistance award within the last three years, if applicable, at all times during which it has an active Federal award or an application or plan under consideration by a Federal awarding agency;
- 4) Remain registered in the SAM database after the initial registration;
- 5) Update its information in the SAM database as soon as it changes;
- 6) Review its information in the SAM database on an annual basis from the date of initial registration or subsequent updates to ensure it is current, accurate and complete; and
- 7) Not make a subaward to any entity unless the entity has provided its unique entity identifier. Subrecipients are not required to obtain an active SAM registration but must obtain a unique entity identifier.
- 8) For purposes of this FOA provision:
 - a. *System for Award Management (SAM)* means the Federal repository into which an applicant must provide information required for the conduct of business as a recipient of Federal funds. Additional information about registration procedures may be found at the SAM internet site (currently at <https://www.sam.gov>).
 - b. *Unique Entity Identifier* means the identifier assigned by SAM to uniquely identify business entities.
 - c. *Entity* includes non-Federal entities as defined at 2 CFR 200.1 and also includes all of the following for purposes of this part:

- i. A foreign organization;
- ii. A foreign public entity;
- iii. A domestic for-profit organization; and
- iv. A Federal agency.
- d. *Subaward* has the meaning given in 2 CFR 200.1.
- e. *Subrecipient* has the meaning given in 2 CFR 200.1.

iii. 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.

iv. Foreign National Participation (September 2021)

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. A "foreign national" is defined as any

person who is not a United States citizen by birth or naturalization. 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 from countries identified on the U.S. Department of State's list of State Sponsors of Terrorism must be obtained from DOE before they can participate in the performance of any work under an award.

v. Export Control Responsibilities (September 2021)

All applicants selected for an award under this FOA and project participants (including subrecipients and contractors) will be required to comply with all applicable U.S. export control laws and regulations in the performance of an award and in the distribution and use of resulting work. The selected applicant will be responsible for obtaining the appropriate licenses or other approvals, for the shipment or transfer of export-controlled items, including technology, unless an exemption or exception applies. The selected applicant will also be responsible for obtaining the appropriate licenses or other approvals before authorizing access to any export-controlled items, including technology, by a foreign person or entity in the performance of this award. Under no circumstances will foreign entities (organizations, companies, or persons) receive access to export-controlled items, including technology, unless authorized pursuant to law or regulation.

The selected applicant and all subrecipients throughout the award project period of performance will maintain formal export control management programs sufficient to support all project activities. The selected applicant will be responsible for oversight of all subrecipients to assure the adequacy of their formal export control management programs.

The selected applicant will be required to immediately report to DOE any export control violations under an award, at the prime or subrecipient level, and the corrective action(s) that will be taken to prevent future violations. The selected applicant will be required to notify DOE when an export-controlled item, including technology, is identified for use in an award. Additionally, the selected applicant will be required to provide DOE with sufficient advanced notification of any export control considerations which may require implementation by DOE of export control mitigation measures.

vi. 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 activities supported by this award in accordance with the Project Management Plan, including providing the required personnel, facilities, equipment, supplies and services;
- Managing and controlling project activities in accordance with 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 subrecipients and external suppliers, including contractors, to ensure effective integration of all work elements;
- Attending annual project review meetings and reporting project status;
- Participating in peer review evaluations of the project, or peer review evaluations of the program that their project supports;
- Submitting technical reports and publicly releasable documents that incorporate DOE comments; and
- Presenting the project results at appropriate technical conferences or meetings as directed by the DOE Project Officer.

DOE Responsibilities. DOE has the right to intervene in the conduct or performance of project activities for programmatic reasons. Intervention includes the interruption or modification of the conduct or performance of project activities. Suspension or termination of the cooperative agreement under 2 CFR part 200, as amended by 2 CFR part 910 (DOE Financial Assistance Regulations) does not constitute intervention in the conduct or performance of project activities.

DOE is responsible for:

- Reviewing in a timely manner project plans, including project management, cybersecurity, interoperability, data management and testing and technology

transfer plans, and recommending alternate approaches, if the plans do not address critical programmatic issues;

- Participating in project management planning activities, including risk analysis, to ensure DOE's program requirements or limitations are considered in performance of the work elements;
- Conducting annual project review meetings 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;
 - Determining testing and demonstration performance expectations;
 - Developing baseline metrics and performance goals prior to demonstrating developed technologies and systems

vii. 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.

viii. 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.

ix. 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.

x. 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.

xi. 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.

xii. Interim Conflict of Interest Policy for Financial Assistance

The DOE interim Conflict of Interest Policy for Financial Assistance (COI Policy) can be found at [PF 2022-17 FAL 2022-02 Department of Energy Interim Conflict of Interest Policy Requirements for Financial Assistance](#).

This policy is applicable to all non-Federal entities applying for, or that receive, DOE funding by means of a financial assistance award (e.g., a grant,

cooperative agreement, or technology investment agreement) and, through the implementation of this policy by the entity, to each Investigator who is planning to participate in, or is participating in, the project funded wholly or in part under the DOE financial assistance award. 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.**

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

xiv. 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.B.r.

xv. Fraud, Waste and Abuse

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 grants and cooperative agreements should 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 (currently FAPIIS). 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]

xvi. Human Subjects Research

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.

Federal regulation and the DOE Order require review by an Institutional Review Board (IRB) of all proposed human subjects research projects. The IRB is an interdisciplinary ethics board responsible for ensuring that the

proposed research is sound and justifies the use of human subjects or their data; the potential risks to human subjects have been minimized; participation is voluntary; and clear and accurate information about the study, the benefits and risks of participating, and how individuals' data/specimens will be protected/used, is provided to potential participants for their use in determining whether or not to participate.

The recipient shall provide the Federal Wide Assurance number identified in item 1) below and the certification identified in item 2) below to DOE prior to initiation of any project that will involve interactions with humans in some way (e.g., through surveys); analysis of their identifiable data (e.g., demographic data and energy use over time); asking individuals to test devices, products, or materials developed through research; and/or testing of commercially available devices in buildings/homes in which humans will be present. Note: This list of examples is illustrative and not all inclusive.

No DOE funded research activity involving human subjects, biospecimens, or identifiable private information shall be conducted without:

- 1) A registration and a Federal Wide Assurance of compliance accepted by the Office of Human Research Protection (OHRP) in the Department of Health and Human Services; and
- 2) Certification that the research has been reviewed and approved by an Institutional Review Board (IRB) provided for in the assurance. IRB review may be accomplished by the awardee's institutional IRB; by the Central DOE IRB; or if collaborating with one of the DOE national laboratories, by the DOE national laboratory IRB.

The recipient is responsible for ensuring all subrecipients comply and for reporting information on the project annually to the DOE Human Subjects Research Database (HSRD) at

<https://science.osti.gov/HumanSubjects/Human-Subjects-Database/home>.

Note: If a DOE IRB is used, no end of year reporting will be needed.

Additional information on the DOE Human Subjects Research Program can be found at: [HUMAN SUBJECTS Human Subjects Pr... | U.S. DOE Office of Science \(SC\) \(osti.gov\)](#).

C. Reporting

i. 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://netl.doe.gov/sites/default/files/2018-10/4600.2%20OE%2009-2018.pdf>

ii. 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.fsr.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

i. 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.

ii. **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 contractors from lawfully reporting waste, fraud, or abuse to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information.

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.

iii. 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.

E. Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment (October 2020)

Recipients and subrecipients are prohibited from obligating or expending federal funds to procure or obtain; extend or renew a contract to procure or obtain; or enter into a contract (or extend or renew a contract) to procure or obtain equipment, services, or systems that use covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. As described in 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).

- a. For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities).
- b. Telecommunications or video surveillance services provided by such entities or using such equipment.
- c. Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

Certain prohibited equipment, systems, or services, including equipment, systems, or services produced or provided by entities identified in Public Law 115-232, section 889, are recorded in the System for Award Management exclusion list.

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:	Thomas Burch
E-mail:	Thomas.Burch@netl.doe.gov

VIII. Other Information

A. Modifications

Notices of any modifications to this FOA will be posted on Grants.gov and the FedConnect portal. You can receive an email when a modification or an 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.

B. Government Right to Reject or Negotiate

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

C. Commitment of Public Funds

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.

D. Treatment of Application Information

DOE will only use data and other information contained in applications for evaluation purposes unless such information is generally available to the public or is already the property of the Government.

Applicants should not include trade secrets or commercial or financial information that is privileged or confidential 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. Applications containing trade secrets or commercial or financial information that is privileged or confidential, which the applicant does not want disclosed to the public or used by the Government for any purpose other than application evaluation, must be marked as described in this section.

The cover sheet of the application must be marked as follows and identify the specific pages containing trade secrets or commercial or financial information that is privileged or confidential:

Notice of Restriction on Disclosure and Use of Data:

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

The header and footer of every page that contains trade secrets or commercial or financial information that is privileged must be marked as follows: “May contain trade secrets or commercial or financial information that is privileged or confidential and exempt from public disclosure.”

In addition, each line or paragraph containing trade secrets or commercial or financial information that is privileged or confidential must be enclosed in brackets.

The above markings enable DOE to follow the provisions of 10 CFR 1004.11(d) in the event a Freedom of Information Act (FOIA) request is received for information submitted with an application. Failure to comply with these marking requirements may result in the disclosure of the unmarked information under a FOIA request or otherwise. The U.S. Government is not liable for the disclosure or use of unmarked information and may use or disclose such information for any purpose.

Subject to the specific FOIA exemptions identified in 5 U.S.C. 552(b), all information submitted to DOE by a FOA applicant is subject to public release under the Freedom of Information Act, 5 U.S.C. §552, as amended by the OPEN Government Act of 2007, Pub. L. No. 110-175. It is the applicant’s responsibility to review FOIA and its exemptions to understand (1) what information may be subject to public disclosure and (2) what information applicants submit to the Government that are protected by law. In some cases, DOE may be unable to make an independent determination regarding which information submitted by an applicant is releasable and which is protected by an exemption. In such cases, DOE will consult with the applicant, in accordance with 10 C.F.R. §1004.11, to solicit the applicant’s views on how the information should be treated.

Applicants shall not identify the entire Project Narrative as exempt from public disclosure.

E. 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.

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

i. Title to Subject Inventions

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

- Domestic Small Businesses, Educational Institutions, and Nonprofits: Under the Bayh-Dole Act (35 U.S.C. § 200 et seq.), domestic small businesses, educational institutions, and nonprofits may elect to retain title to their subject inventions;
- All other parties: The federal Non-Nuclear Energy Act of 1974, 42 U.S.C. § 5908, provides that the government obtains title to new inventions unless a waiver is granted (see below);
- Class Patent Waiver: DOE intends to issue a class waiver that will apply to this FOA. Under this class waiver, domestic large businesses may elect title to their subject inventions similar to the right provided to the domestic small businesses, educational institutions, and nonprofits by law. In order to avail itself of the class waiver, a domestic large business must agree that any products embodying or produced through the use of a subject invention first created or reduced to practice under this program will be substantially manufactured in the United States.
- Advance and Identified Waivers: For an applicant not covered by a Class Patent Waiver or the Bayh-Dole Act, the applicant may request a patent waiver that will cover subject inventions that may be invented under the award, in advance of or within 30 days after the effective

date of the award. Even if an advance waiver is not requested or the request is denied, the recipient will have a continuing right under the award to request a waiver for identified inventions, i.e., individual subject inventions that are disclosed to DOE within the timeframes set forth in the award's intellectual property dataterms and conditions. Any patent waiver that may be granted is subject to certain terms and conditions in 10 CFR 784.

- 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 VI.B.xx. U.S. Manufacturing Commitments of this FOA. A copy of the DEC can be found at <https://www.energy.gov/gc/determination-exceptional-circumstances-decs>. Pursuant to 37 CFR 401.4, any nonprofit organization or small business firm as defined by 35 U.S.C. § 201 affected by any DEC has the right to appeal it by providing written notice to DOE within 30 working days from the time it receives a copy of the determination.
- DOE may issue and publish on the website above further DEC's prior to the issuance of awards under this FOA. DOE may require additional submissions or requirements as authorized by any applicable DEC.

ii. Government Rights in Subject Inventions

Where prime recipients and subrecipients retain title to subject inventions, the United States government retains certain rights.

Government Use License

The United States government retains a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States any subject invention throughout the world. This license extends to contractors doing work on behalf of the government.

March-In Rights

The United States government retains march-in rights with respect to all subject inventions. Through "march-in rights," the government may require a prime recipient or subrecipient who has elected to retain title to a subject invention (or their assignees or exclusive licensees), to grant

a license for use of the invention to a third party. In addition, the government may grant licenses for use of the subject invention when a prime recipient, subrecipient, or their assignees and exclusive licensees refuse to do so.

DOE may exercise its march-in rights only if it determines that such action is necessary under any of the four following conditions:

- The owner or licensee has not taken or is not expected to take effective steps to achieve practical application of the invention within a reasonable time;
- The owner or licensee has not taken action to alleviate health or safety needs in a reasonably satisfied manner;
- The owner has not met public use requirements specified by federal statutes in a reasonably satisfied manner; or
- The United States manufacturing requirement has not been met.

Any determination that march-in rights are warranted must follow a fact-finding process in which the recipient has certain rights to present evidence and witnesses, confront witnesses and appear with counsel and appeal any adverse decision. To date, DOE has never exercised its march-in rights to any subject inventions.

G. 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.

H. Notice Regarding Eligible/Ineligible Activities

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

I. 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).

J. 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.

K. 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.

L. 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.

M. 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)

N. 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.

O. 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.

P. 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.

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

i. 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 continuing 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. The applicant does not have the right to appeal DOE's decision concerning a waiver request. Consequences for violations of this prohibition will be determined according to applicable law, regulations, and policy. DOE may modify and add requirements related to this prohibition to the extent required by law.

ii. Definitions

- 1) **Foreign Government-Sponsored Talent Recruitment Program.** An effort directly or indirectly organized, managed, or funded by a foreign government 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 physically relocate 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.
- 3) **Scientific and Technical Information.** Information products deemed by the originator to be useful beyond the originating site (e.g., intended to be published or disseminated), in any format or medium, which contain findings and technological innovations resulting from R&D efforts and scientific and technological work of scientists, researchers, and engineers. Scientific findings are communicated through various media – e.g., textual, multimedia, audiovisual, and digital – and are produced in a range of products such as technical reports, scientific/technical conference papers, journal articles, workshop reports, program documents, invention reports, patent applications, patents, publicly available scientific research datasets, or other forms of scientific and technical information.

R. 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.

IX. Appendices

APPENDIX A – COST SHARE INFORMATION

Cost Sharing or Cost Matching

The terms “cost sharing” and “cost matching” are often used synonymously. Even 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.

Blended cost share (20% & 50%)

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 an 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 AS THE PRIME RECIPIENT, PERFORMANCE OF WORK IN THE UNITED STATES, AND DOMESTIC CONTENT PROCUREMENT PREFERENCE FOR BUY AMERICAN REQUIREMENT FOR INFRASTRUCTURE PROJECTS

i. Waiver for Foreign Entity Participation as the Prime Recipient

As set forth in Section III, all Prime Recipients receiving funding under this FOA must be incorporated (or otherwise formed) under the laws of a State or territory of the United States. To request a waiver of this requirement, an applicant must submit an explicit waiver request in the Full Application.

Overall, the applicant 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 have a foreign entity serve as the Prime Recipient. A request to waive the *Foreign Entity Participation as the Prime Recipient* requirement must include the following:

- Entity name;
- The rationale for proposing a foreign entity to serve as the Prime Recipient;
- Country of incorporation; and the extent, if any, the entity is state owned or controlled;
- A description of the project's anticipated contributions to the US economy;
 - How the project will benefit U.S. research, development, and manufacturing, including contributions to employment in the U.S. and growth in new markets and jobs in the U.S.;
 - How the project will promote domestic American manufacturing of products and/or services;
- A description of how the foreign entity's participation as the Prime Recipient is essential to the project;
- A description of the likelihood of Intellectual Property (IP) being created from the work and the treatment of any such IP;
- Countries where the work will be performed (Note: if any work is proposed to be conducted outside the U.S., the applicant must also complete a separate request for waiver of the Performance of Work in the United States requirement).

DOE may require additional information before considering the waiver request.

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

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

As set forth in Section IV, all work under DOE funding agreements must be performed in the United States. This requirement does not apply to the purchase of supplies and equipment, so a waiver is not required for foreign purchases of these items. However, the Prime Recipient should make every effort to purchase supplies and equipment within the United States. There may be limited circumstances where it is in the interest of the project to perform a portion of the work outside 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 to waive the *Performance of Work in the United States* requirement must include the following:

- The rationale for performing the work outside the U.S. (“foreign work”);
- A description of the work and the percentage of the direct labor (including subrecipients) proposed to be performed outside the U.S.;
- An explanation as to how the foreign work is essential to the project;
- A description of the anticipated benefits to be realized by the proposed foreign work and the anticipated contributions to the US economy;
 - The associated benefits to be realized and the contribution to the project from the foreign work;
 - How the foreign work will benefit U.S. research, development and manufacturing, including contributions to employment in the U.S. and growth in new markets and jobs in the U.S.;
 - How the foreign work will promote domestic American manufacturing of products and/or services;
- A description of the likelihood of Intellectual Property (IP) being created from the foreign work and the treatment of any such IP;
- The total estimated cost (DOE and Recipient cost share) of the proposed foreign work;
- The countries in which the foreign work is proposed to be performed; and
- The name of the entity that would perform the foreign work, by country (if more than one foreign country is proposed).

DOE may require additional information before considering the waiver request.

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

iii. Waiver for Domestic Content Procurement Preference for Buy American Requirement for Infrastructure Projects

As set forth in Section IV.J.viii., all of the iron, steel, manufactured products and construction materials used in the infrastructure activities of the project must be produced in the United States.

There may be limited circumstances where it is in the interest of the project to acquire iron, steel, manufactured products or construction materials produced outside of the United States. To seek a waiver of the Domestic Content Procurement Preference for Buy American Requirement for Infrastructure Projects, the applicant or recipient must submit an explicit waiver request in the Full Application. A separate waiver request must be submitted for each item, good, product or material mined, produced, or manufactured 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 acquire iron, steel, manufactured products, or construction materials produced outside of the United States. A request to waive the Domestic Content Procurement Preference for Buy American Requirement for Infrastructure Projects 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 for Buy American Requirement for Infrastructure Projects requirement, including name, cost, country(ies) of origin (if known), and relevant PSC and 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.

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

APPENDIX C – 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.

[*****BEGINNING OF SOPO TEMPLATE*****]

STATEMENT OF PROJECT OBJECTIVES (SOPO)

Insert Project Title

A. OBJECTIVES

Clearly and concisely describe the objective(s) of the project. If the project includes multiple phases of work, describe the objective(s) for each phase. 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 if applicable). 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. If the project contains any 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.

Subtask 1.2 – National Environmental Policy Act (NEPA) Compliance

As required, the Recipient shall provide the documentation necessary for NEPA compliance.

Subtask 1.3 – Data Management Plan

The Recipient shall maintain the Data Management Plan (DMP) that was incorporated into the award during the negotiation process. The Recipient shall manage the generation/gathering, storage/preservation and sharing/dissemination of project data in accordance with the DMP. If needed, updates to the DMP must be negotiated and, if accepted, changes will be incorporated into the award/attachment.

Subtask 1.4 – Commercialization Plan

Within 90 days of starting work on Phase 2 of the project (Field Test/Demonstration), the Recipient shall revise the Commercialization Plan that was submitted with their application including any details from Phase 1 of the project and through consultation with the FPO. The Recipient shall manage the U.S. manufacturing commitments, as well as the technology maturation and licensing in accordance with the Commercialization Plan.

Subtask 1.5 –Cybersecurity Plan

Within 90 days of award, the Recipient shall submit a Cybersecurity Plan (CSP) in accordance with instructions provided with the Federal Assistance Reporting Checklist. This plan is subject to DOE review and acceptance, and the Recipient is expected to comply with this plan throughout the life of the project. The Recipient should refer to Appendix E “Cybersecurity Plan” for additional requirements/guidelines regarding preparation of this plan.

In general, the CSP should demonstrate the Recipient’s understanding of cybersecurity issues and explain the techniques/methods that will be implemented and maintained throughout the life of the proposed project.

Subtask 1.6 – Interoperability Plan

Within 90 days of award, the Recipient shall submit an Interoperability Plan (ISP) in accordance with instructions provided with the Federal Assistance Reporting Checklist. This

plan is subject to DOE review and acceptance, and the Recipient is expected to comply with this plan throughout the life of the project. The Recipient should refer to Appendix F “Interoperability Plan” for additional requirements/guidelines regarding preparation of this plan.

In general, the ISP should demonstrate the Recipient’s understanding of interoperability issues and explain the techniques/methods that will be implemented and maintained throughout the life of the proposed project.

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.

Field Test/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)

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 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 1.3 – Data Management Plan – Due within 90 days after award

Subtask 1.4 – Commercialization Plan - Due within 90 days of starting work on Phase 2 of the project

Subtask 1.5 – Cybersecurity Plan - Due within 90 days after award

Subtask 1.6 – Interoperability Plan - Due within 90 days after award

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 Federal Project Officer, which may be held at a DOE or Recipient's facility, other mutually agreeable location, or via webinar. 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 D – 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}

{Recipient Organization Name}

{Address}

{City, State, Zip Code}

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

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

[REMOVE IF YOUR PROJECT HAS A SINGLE BUDGET PERIOD]

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}*

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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 #
SOP:	Statement of Project Objectives

Add project specific acronyms as needed.

RECIPIENT SHOULD REMOVE ALL ITALICIZED INSTRUCTIONS AND EXAMPLES FROM EACH.

I. 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.

II. 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			

III. 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)
<i>Prime Recipient</i>	<i>1.0 - Manage and execute the project. Develop required plans. X.Y - Design evaluations.</i>
<i>Utility ABC</i>	<i>X.Y - Providing data. X.Y - Software demonstration host; will install at backup/secondary control center.</i>
<i>Professor Tom Smith, (University Name)</i>	<i>X.Y - Engineering code development.</i>

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

IV. PROJECT BUDGET AND SPEND PLAN

Complete the following table by identifying whether each SOPO task is a R&D task or demonstration task and its cost share information. The denotation in this table is just an example:

Task	Federal Share (\$)	Federal Share (%)	Non-Federal Share (\$)	Non-Federal Share (%)	Total Project Cost (\$)
Task 1 (R&D)					
Task 2 (R&D)					
Task 3 (Demonstration)					
...					
TOTALS					

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			
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			
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, "FY23, Q1" would refer to the quarter that began October 1, 2022.

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			

V. 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)
<i>NDAs with industry partners are signed</i>	<i>X.Y</i>	<i>MM/DD/YY</i>	<i>Confirmation email to Federal Project Officer.</i>
<i>Design specification complete.</i>	<i>X.Y</i>	<i>MM/DD/YY</i>	<i>Confirmed in quarterly report.</i>

VI. 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
1.3	Data Management Plan	MM/DD/YY
1.4	Commercialization Plan	MM/DD/YY
1.5	Cybersecurity Plan	MM/DD/YY
1.6	Interoperability Plan	MM/DD/YY

VII. 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
<i>X.X</i>	<i>Estimated capital cost</i>	<i>\$/unit</i>	<i>\$1,000</i>
<i>X.X</i>	<i>Number of utilities participating in energy emergency exercises</i>	<i>#</i>	<i>15</i>
<i>X.X</i>	<i>System energy efficiencies</i>	<i>%</i>	<i>Improvement by >20%</i>
<i>X.X</i>	<i>Outage time of critical loads</i>	<i>Hours/ Interruption</i>	<i>Reduced by >98%</i>

VIII. 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 E – Cybersecurity Plan

A Cybersecurity Plan (due within 90 days after award issue) explains how the award recipient will demonstrate their awareness of cybersecurity in the context of the project and establish a plan for ensuring and maintaining cybersecurity throughout the life of the proposed solution. It should demonstrate the Recipient's understanding of cybersecurity issues within the proposed solution, as well as what issues exist at the external interfaces at the solution boundaries. This plan is subject to DOE review and acceptance, and the recipient is expected to comply with this plan throughout the life of the project.

A Cybersecurity Plan must address not only deliberate attacks launched by disgruntled employees, agents of industrial espionage, terrorists, and other adversaries, but also inadvertent compromises of the information infrastructure due to user errors, equipment failures, and natural disasters. Security must be included in all phases of the system development life cycle, from design phase through implementation, maintenance, and disposition. Systems for critical applications need to withstand cybersecurity events with no loss of critical function.

Cybersecurity Plan Requirements

In order for the plan to be considered acceptable, it must address the following: **At a minimum, the Cybersecurity Plan must describe how the award Recipient plans to establish cybersecurity between networks, systems, devices, applications or components within the proposed solution, and at the necessary external interfaces at the solution boundaries. Recipients are directed to maximize the use of open standards wherever possible and adhere to the hierarchy of desirable cybersecurity techniques listed above, and document deviation from open standards and the utilization of proprietary standards where the Recipient deems necessary.**

The approach to cybersecurity should include:

- A summary of the cybersecurity risks and how they will be mitigated at each stage of the lifecycle (focusing on vulnerabilities and impact).
- A summary of the cybersecurity criteria utilized for vendor and device selection.
- A summary of the relevant cybersecurity standards and/or best practices that will be followed.
- A summary of how the project will support emerging smart grid cybersecurity standards.

- Plans should also address the adequacy of their approach for addressing
- Ensuring confidentiality, integrity, availability
- Secure logging, monitoring, alarming, and notification

Suggested Elements for a Cybersecurity Plan

The following list of elements for a Cybersecurity Plan provides suggestions regarding the cybersecurity assessment process and the structure of the plan:

Assessment of Scope: A discussion of the scope of the solution should be made, as well as the anticipated challenges (such as confidentiality, integrity or availability is high, but systems or component resources are low). Recipients should document all the interfaces (where information is exchanged between networks, systems, devices, applications or components) in their proposed solution as a method for assessing the full scope of the plan. It should be noted that an assessment of all interfaces is also required for an Interoperability Plan, and both plans can utilize the same assessment.

Content and Format: A statement of plan for designing in cybersecurity, including a defense in depth approach, and plans for sustaining cybersecurity for the life of the solution. Where existing practice or standards seem inadequate, Recipients should propose remedies through open public mechanisms to alleviate them over time. Existing, accepted community standards should be used where possible. Where community standards are missing or inadequate, the plan could propose alternate strategies, and should advise the sponsoring program.

Additional Guidance

The DOE, NIST and other organizations have worked with both public and private sector organizations to advance the state of the art of cybersecurity in energy delivery systems. Recipients are encouraged to seek out resources appropriate to their solution space, but should also consider the following:

- DOE - *Energy Sector Cybersecurity Framework Implementation Guidance*
- NIST - *Framework for Improving Critical Infrastructure Cybersecurity*
- NIST - *NISTIR 7628, Rev1 Guidelines for Smart Grid Cybersecurity*
- NIST - *SP 800-53 Security and Privacy Controls for Information Systems and Organizations*
- NIST – *SP 1500-201 Framework for Cyber-Physical Systems*
- EPRI - *Cyber Security Strategy Guidance for the Electric Sector*
- NRECA – *Guide to Developing a Cyber Security and Risk Mitigation Plan*
- NRECA – *Interoperability and Cyber Security Plan*

- ISA – *ISA/IEC 62443 Series of Standards on Industrial Automation and Control Systems (IACS)*
- DOE/OE – *Data Privacy and the Smart Grid: A Voluntary Code of Conduct (2015)* (<https://www.energy.gov/oe/downloads/data-privacy-and-smart-grid-voluntary-code-conduct>)

Plans should address or discuss how compliance with the various standards and community best practices will be achieved and make use of community accepted resources whenever practicable.

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

APPENDIX F – Interoperability Plan

An Interoperability Plan (Plan) is due within 90 days after award issue. The Plan explains how the award recipient will ensure that information can flow and be used across a complex system. It should demonstrate the Recipient's understanding of interoperability issues within its proposed solution, as well as what issues exist at the external interfaces at the solution boundaries. This plan is subject to DOE review and acceptance, and the recipient is expected to comply with this plan throughout the life of the project.

The de facto gold standard of interoperability is "plug-and-play". As attractive as this concept is, achieving plug-and-play is not easy and in many complex situations and technology readiness levels, it is not practical to specify standard interfaces to this level of detail. Therefore, a progression of interoperability techniques, from most desirable to least desirable is as follows:

- Plug-and-play with a full testing and certification program (e.g. USB)
- Interfaces use a common, published model (e.g. CIM between open standards)
- Interfaces can be transformed or mapped (e.g. published protocol translation)
- No standard exists, completely custom integration.

Interoperability Plan Requirements

In order for the plan to be considered acceptable, it must address the following: **At a minimum, the Interoperability Plan must describe how the award Recipient plans to establish interoperability between networks, systems, devices, applications or components within the proposed solution, and at the necessary external interfaces at the solution boundaries. Recipients are directed to maximize the use of open standards wherever possible and adhere to the hierarchy of desirable interoperability techniques listed above, and document deviation from open standards and the utilization of proprietary standards where the Recipient deems necessary.**

The Interoperability Plan should reference open public standards and their respective organizations where appropriate. Additional resources regarding interoperability are available through the GridWise Architecture Council (www.gridwiseac.org), the Smart Grid Interoperability Panel (www.sgip.org), and the Buildings Technology Office of EERE (<http://energy.gov/eere/buildings/downloads/buildings-interoperability-landscape>).

Suggested Elements for an Interoperability Plan

The following list of elements for an Interoperability Plan provides suggestions regarding the interoperability assessment process and the structure of the plan:

Assessment of Scope: A discussion of the scope of the solution should be made, as well as the anticipated challenges, such as where interoperability is low or decisions among standards must be made. Recipients should document all the interfaces (where information is exchanged between networks, systems, devices, applications or components) in their proposed solution as a method for assessing the full scope of the plan. It should be noted that an assessment of all interfaces is also required for a Cybersecurity Plan, and both plans can utilize the same assessment.

Content and Format: A statement of plan for achieving interoperability, and plans for sustaining interoperability and improving it over time. Where existing practice or open standards fall short, Recipients should propose remedies through open public mechanisms to alleviate them over time. Existing, accepted community standards should be used where possible. Where community standards are missing or inadequate, the plan could propose alternate strategies, and should advise the sponsoring program of any need to develop or generalize standards.

Additional Guidance

Plans should address or discuss how compliance with the various standards and community best practices will be achieved, and make use of community accepted resources whenever practicable.

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