Financial Assistance
Notice of Funding Opportunity
Part 1

U.S. Department of Energy (DOE)
Office of Electricity
HARMONY: Human-Centric Analytics for Resilient & Modernized Power sYstems

Notice of Funding Opportunity Number: DE-FOA-0003446

Concept papers due: January 27, 2025, 5:00PM ET
Full applications due: March 20, 2025, 5:00PM ET

Modifications to this NOFO will be posted on Grants.gov and the FedConnect portal. Grants.gov and FedConnect will automatically notify applicants when a NOFO modification is processed. Applicants must be registered to this NOFO in Grants.gov to receive email notifications. Register in FedConnect as an interested party to this NOFO for announcement messages. It is recommended that you register as soon after release of the NOFO as possible to ensure you receive timely notice of any modifications or other announcements. See Registration Requirements in Part 2 of this NOFO.

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Before You Begin

Navigating the Notice of Funding Opportunity

The OMB Memorandum M-24-11 directs federal agencies to reduce the burden on applicants in the Notice of Funding Opportunity (NOFO) process and limit the length of the NOFO information requests. With Fiscal Year (FY) 2025 NOFOs, DOE has separated the NOFO into two parts.

The NOFO Part 1 describes the specific DOE programmatic goals and evaluation criteria, eligibility, and other components that are specific to each funding opportunity. The NOFO Part 2 includes the fixed DOE requirements that generally do not change from NOFO to NOFO, including standard information for the application phase, expectations for award negotiations, and post-award requirements. Applicants must review both the NOFO Part 1 and the NOFO Part 2 prior to applying. To facilitate navigation, you will find links throughout this document to additional information found in Part 2.

There are several required one-time actions applicants must take before applying to this NOFO. Some of these actions may take several weeks, so it is vital applicants build in enough time to complete them. Failure to complete these actions could interfere with application or negotiation deadlines or the ability to receive an award if selected. If you have previously completed the necessary registrations, make sure your registration is active and up to date. All registrations are free. Please refer to NOFO Part 2, *Get Registered,* for additional information.

This announcement is published in conjunction with NOFO Part 2 version 1.0.

I. Basic Information

A. Key Facts

Issuing Agency	Department of Energy, Office of Electricity
Funding Opportunity Title	HARMONY: Human-Centric Analytics for Resilient & Modernized Power sYstems
Announcement Type	Initial release
Funding Opportunity Number	DE-FOA-0003446
Funding Instrument	Cooperative Agreements
Assistance Listing Number	81.122 Electricity Research Development and Analysis
Funding Opportunity Description	This NOFO aims to enhance grid reliability and resilience in the face of growing uncertainties and in the age of big data to accelerate pathways towards DOE grid modernization goals. Successful implementation of projects will enable rigorous quantification of risks and uncertainties and their communication to decision-makers and human operators for enhanced grid visibility and resilience.
Objective(s)	To advance the state of the art for power system uncertainty and risk metrics to help human operators receive actionable information to better understand, predict, prevent, and mitigate cascading failures in power grids.
Topic Areas	Single topic area.
Eligible Applicants	Eligibility for prime applicants is restricted to domestic universities, colleges, DOE Federally Funded Research and Development Centers (FFRDCs) and non-profit research institutions and think-tanks.
FedConnect URL and Helpdesk	FedConnect NOFO URL FedConnect Helpdesk
Grants.gov URL and Helpdesk	Grants.gov URL Grants.gov Support

KEY DATES

Notice of Funding Opportunity Issue Date:
12/9/2024

Concept Paper Deadline:
1/27/2025

Anticipated Concept Paper Notification Date:
2/18/2025

Application Deadline:
3/20/2025

Anticipated Selection Notification Date:
6/24/2025

Anticipated Award Date:
9/22/2025

Estimated Period of Performance:
9/22/2025 – 9/21/2028

1. Funding Details

Single Topic Area

- Approximate total available funding: **$6,250,000 in FY25**
- Approximate number of awards: **5**
- Approximate dollar amount of individual awards: **$1,250,000**
- Minimum cost share required: **None**
- Approximate award project period: **36 months**
- Anticipated length of budget periods: **36 months**

2. Period of Performance

DOE anticipates making awards comprised of one budget period. Project continuation will be contingent upon several elements, including satisfactory performance and DOE's Go/No-Go decision. For a complete list and more information on the Go/No-Go review, see the NOFO Part 2, *Award Administration Information*.

B. Executive Summary

The Office of Electricity (OE) provides leadership to ensure that the Nation's energy delivery system provides reliable, resilient, secure, and affordable electricity. This NOFO would support the Department's vision to enhance grid reliability and resilience and to accelerate pathways towards grid modernization goals. The objective of this NOFO is to enhance grid reliability and resilience in the face of growing uncertainties and in the age of digital information systems and networks. It is critical to quantify and clearly communicate risk and uncertainties to decision-makers and human operators. This NOFO would seek applications to conduct Research and Development and Demonstration (RD&D) activities that advance the state of the art for power system uncertainty and risk metrics to help human operators receive actionable information to better understand, predict, prevent, and mitigate cascading failures in power grids. This is a newly developing field for the power sector with few, if any, commercial tools. It is therefore assumed this topic area will require an academic or research institution to be heavily involved in the project to achieve program objectives. Therefore, DOE is restricting eligibility to universities, colleges, DOE FFRDCs and non-profit research institutions or think-tanks to serve as the prime applicant. Prime applicants are encouraged to apply in partnerships with electric sector partners and technology providers to ensure the research remains relevant to industry.

C. Agency Contact Information

Office of Electricity
U.S. Department of Energy
1000 Independence Ave SW
Washington, D.C. 20585

Questions regarding this NOFO must be submitted through the FedConnect portal.

DISCLAIMER: Applicants are discouraged from submitting information considered proprietary unless it is deemed essential for proper evaluation of the application. If the application contains information that

the applicant organization considers to be trade secrets, information that is commercial or financial, or information that is privileged or confidential, the pages containing that information must be identified as specified in the application instructions. When such information is included in the application, it will be withheld from public disclosure to the extent permitted by law, including the Freedom of Information Act, with the understanding that the information will be used or disclosed only for evaluation of the application. The information contained in the application will be protected by DOE from unauthorized disclosure, consistent with the need for merit review of applications of financial assistance awards to assure the integrity of the competitive process and the accuracy and completeness of the information. If a federal financial assistance award is made as a result of or in connection with an application, the federal government has the right to use or disclose the information to the extent authorized by law. This restriction does not limit the federal government's right to use the information if it is obtained without restriction from another source.

II. Eligibility

To be considered for substantive evaluation, an applicant's submission must meet the criteria set forth below. If the application does not meet these eligibility requirements, it will be considered ineligible and removed from further evaluation and ineligible for any award. DOE will not make eligibility determinations for potential applicants prior to the date on which applications to this NOFO must be submitted. The decision whether to apply in response to this NOFO lies solely with the applicant. The information included here is specific to eligibility requirements for this NOFO. For eligibility requirements applicable to all NOFOs, please consult the NOFO Part 2, *Eligibility*.

A. Eligible Applicants

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

1. Restricted Eligibility

In accordance with 2 CFR 910.126, Competition, eligibility for this NOFO is restricted because this is a newly developing field for the power sector with few, if any, commercial tools. It is therefore assumed this topic area will require an academic or research institution to be heavily involved in the project to achieve program objectives. DOE is restricting eligibility to universities, colleges, DOE Federally Funded Research and Development Centers (FFRDCs), and non-profit research institutions or think-tanks to serve as the prime applicant.

2. Domestic Entities

Domestic entities are eligible to apply as recipients or subrecipients. The following types of domestic entities are eligible to participate as a recipient or subrecipient of this NOFO:

- Institutions of higher education;
- Nonprofit organization;

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

3. Foreign Entity Participation

In general, foreign entities are not eligible to apply as either a recipient or subrecipient. In limited circumstances, DOE may approve a waiver to allow a foreign entity to participate as a recipient or subrecipient.

A foreign entity may submit an application to this NOFO, but the application must be accompanied by an explicit written waiver request. Likewise, if the applicant seeks to include a foreign entity as a subrecipient, the applicant must submit a separate explicit written waiver request in the application for each proposed foreign subrecipient. Please see NOFO Part 2, *Application Content Requirements* for the

requirements for submission of a foreign entity waiver request. The applicant does not have the right to appeal DOE's decision concerning a waiver request.

Prime recipients and subrecipients must be legally formed in the United States, have majority domestic ownership and control, and have a physical location for business operations in the United States.

Entities that are organized, chartered, or incorporated (or otherwise formed) under the laws of the United States or a particular state or territory of the United States and have a physical location for business operations in the United States are eligible to apply for funding as a recipient or subrecipient.

Foreign Entity Participation
A foreign entity is eligible to apply for funding as a recipient if it designates in the application a subsidiary or affiliate incorporated (or otherwise formed) under the laws of a state or territory of the United States to be the recipient. The 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 recipient in the application (i.e., a foreign entity may request that it be the recipient). To do so, the applicant must submit an explicit written waiver request in the application.

NOFO Part 2, *Application Content Requirements* lists the 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.

Participant Limitations
Participation of the following entities are limited as follows.

- DOE FFRDCs[1] are eligible to apply for funding as a recipient or subrecipient.
- Non-DOE FFRDCs are eligible to participate as a subrecipient but are not eligible to apply as a recipient.
- Federal agencies and instrumentalities (other than DOE) are eligible to participate as a subrecipient but are typically not eligible to apply as a 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 recipient or subrecipient will be considered non-responsive.

Performance of Work in the United States
All work for the awards under this NOFO must be performed in the United States. To request a waiver of this requirement, the applicant must submit an explicit waiver request in the application. Absent an approved waiver, such costs will not be allowable under the award. The NOFO Part 2, *Application Content Requirements* lists the requirements for submission of a foreign work waiver request.

[1] FFRDCs are public-private partnerships that conduct research for the U.S. government. A listing of FFRDCs can be found at http://www.nsf.gov/statistics/ffrdclist/.

Ineligible Participants
The following entities are ineligible for participation in this NOFO as a recipient, subrecipient, or subcontractor.

- In accordance with 2 CFR 200.214, entities banned from doing business with the U.S. government such as entities debarred, suspended, or otherwise excluded from or ineligible for participating in federal programs.
- Entities identified on Department of the Treasury Office of Foreign Assets Control Treasury's Sanctions Program Specially Designated Nationals list are prohibited from doing business with the United States government and are not eligible. See OFAC - Sanctions List Service (treas.gov).
- 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.

Entity of Concern Prohibition
Entities of Concern are prohibited from participating in projects selected under this NOFO (see NOFO Part 2, *Eligibility, Other Eligibility Information, Entity of Concern Prohibition* section for details and definitions).

B. Limitation on Number of Concept Papers and Full Applications Eligible for Review

An entity may submit multiple concept papers and applications for each topic area of this NOFO as long as each concept paper and associated application describes a unique, scientifically distinct project. If an entity submits duplicate applications, the DOE will only review the last submission. This limitation does not prohibit an applicant from collaborating on other applications (e.g., as a potential subrecipient or partner).

C. Cost Sharing

Applicants are expected to follow through on estimated cost share commitments proposed in their applications if selected for award negotiations. Please refer to the NOFO Part 2, *Eligibility* for more information on Cost Sharing.

1. Cost Share Requirements

Cost sharing is not required under this NOFO.

D. FFRDC Eligibility Criteria

1. DOE FFRDCs as the Applicant

A DOE FFRDC is eligible to apply for funding under this NOFO if its cognizant Contracting Officer provides written authorization and this authorization is submitted with the application.

The following wording is acceptable for the authorization:

> *Authorization is granted for the Laboratory to participate in the proposed project. The work proposed for the Laboratory is consistent with or complementary to the missions of*

the Laboratory and will not adversely impact execution of the DOE assigned programs at the Laboratory.

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

2. DOE and Non-DOE FFRDCs as a Subrecipient

As long as they have no conflict, DOE and non-DOE FFRDCs may be proposed as a subrecipient on another entity's application subject to the following guidelines:

Authorization for non-DOE FFRDCs

The federal agency sponsoring the FFRDC must authorize in writing the use of the FFRDC on the proposed project and this authorization must be submitted with the application. The use of a FFRDC must be consistent with its authority under its award.

Authorization for DOE FFRDCs

The cognizant Contracting Officer for the FFRDC must authorize in writing the use of the FFRDC on the proposed project and this authorization must be submitted with the application. The following wording is acceptable for this authorization:

Authorization is granted for the Laboratory to participate in the proposed project. The work proposed for the Laboratory is consistent with or complementary to the missions of the Laboratory and will not adversely impact execution of the DOE assigned programs at the Laboratory.

Funding, Cost Share, and Subaward with FFRDCs

The 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 recipient under its DOE award. Such an agreement must be fully executed prior to the FFRDC starting work directly allocable to the FA award. The DOE funding office will provide funding for the DOE FFRDC or non-DOE FFRDC, participating as a sub awardee through the DOE financial assistance award to the recipient.

The applicant should prepare the budgets using rates appropriate for funding the FFRDCs through subawards. The applicant's cost share requirement will be based on the total cost of the project, including the applicant's, the subrecipient's, and the FFRDC's portions of the project.

Responsibility

The recipient 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 recipient and the FFRDC.

III. Program Description

A. Background and Purpose

It is critical to quantify and clearly communicate risk and uncertainties to decision-makers and human operators to predict, prevent, mitigate and enable better understanding of cascading failures in power grids.

The ongoing transformation of the power grid is characterized by *deep* uncertainties[2,3], Deep uncertainties where experts cannot agree upon appropriate models, probability distributions, key variables and parameters, and how to value different outcomes[4], are growing significantly due to:

1. Integration of distributed assets and intermittent renewable energy sources have shifted power supply,
2. The emergence of prosumers (consumers who also generate electricity),
3. The growing role of third-party aggregators managing these distributed assets,
4. Increased electrification leading to increased interdependencies among critical infrastructure, and
5. Increased digitization with associated cyber risks as well as increased volume and velocity of data.

These grid transformation trends are fundamentally shifting the physics of the power system, and long-standing assumptions that power system operations and simulations have been built on may no longer be accurate. The convergence of power systems and communication systems critical to operations challenges decision makers by requiring information on multi-sector risks associated with data integrity. In addition to the fundamental changes with grid systems, there are exogenous changes impacting reliability and resilience. The challenge associated with operating the grid under growing areas of uncertainty is further amplified by the changes in the frequency, intensity and (landfall) locations of extreme weather and climate events and increased frequency of compound climate risks under climate change.

To ensure a reliable and resilient grid operations and operational planning in this rapidly evolving landscape and to effectively manage the emerging risks, a more rigorous understanding, characterization, and visualization of uncertainties is crucial.

This necessitates a shift beyond simply characterizing *aleatory*[5] uncertainties, due to statistical, inherent randomness (like signal noise). It is critical to also actively identify, assess, and effectively communicate epistemic[1] , systematic uncertainties that stem from lack of clarity on the operational strategies,

[2] Haas, C., Jahns, H., Kempa, K. and Moslener, U., 2023. Deep uncertainty and the transition to a low-carbon economy. Energy Research & Social Science, 100, p.103060.
[3] Marchau, V.A., Walker, W.E., Bloemen, P.J. and Popper, S.W., 2019. Decision making under deep uncertainty: from theory to practice (p. 405). Springer Nature.
[4] Lempert, R.J., 2003. Shaping the next one hundred years: New methods for quantitative, long-term policy analysis.
[5] Hüllermeier, E. and Waegeman, W., 2021. Aleatoric and epistemic uncertainty in machine learning: An introduction to concepts and methods. Machine learning, 110(3), pp.457-506.

simulations, and system states. Epistemic uncertainties include uncertainties arising from knowledge limitations or incomplete data that system operators and decision-makers maybe have when managing a rapidly changing power system in real time.

Significant advancements have been made in recent years in modeling and managing various sources of uncertainty in power grids, with a primary emphasis on assessing aleatory/statistical uncertainties, capturing variabilities in 'data rich' system. However, there are still significant gaps, particularly in our understanding and ability to characterize, assess, and communicate epistemic/systematic uncertainties. These uncertainties are especially critical in "data-poor" systems, where limited historical information about weather patterns, grid behavior, and consumer demand can hinder accurate risk assessment.

Addressing these data and knowledge gaps is essential for building robust and adaptable power systems that can navigate the uncertainties of the future. Filling these gaps requires providing grid operators and decision makers with actionable information that incorporates account both allegory/statistical and epistemic/systematic uncertainties.

Advanced, physics- and human behavior-aware analytics are critical to address challenges related to new and variable system dynamics. These analytics are critical to enabling renewable integration, increased infrastructure decentralization, and infrastructure interdependency under a changing climate. Uncertainty-informed advanced analytics that extract actionable information from data and knowledge need to consider not only systems' physics but also human factors to be effective.

B. Objectives

This NOFO seeks applications to enhance grid reliability and resilience in the face of growing uncertainties and in the age of big data to accelerate pathways towards grid modernization goals. Proposed solutions to this Announcement will support and ensure a more secure, resilient, and reliable energy delivery system by mitigating and enabling better understanding of cascading failures in power grids. To ensure a reliable and resilient grid operations and operational planning in this rapidly evolving landscape and to effectively manage the emerging risks, a more rigorous understanding, characterization, and visualization of uncertainties is crucial. Detailed technical descriptions of the major subject matter areas are provided in the sections that follow.

C. Expected Performance Goals

Because applicant proposed research questions and technical solutions within this topic area may vary, the NOFO does not prescribe a list of success metrics. However, the application should define success metrics appropriate to the project to be used in technology evaluation.

D. Teaming Partnerships

While eligibility for prime applicants to this NOFO is being restricted to universities, colleges, DOE FFRDCs, and non-profit research institutions or think-tanks, partnerships with other entities are encouraged. More specifically, partnerships between research institutions, electric sector partners, and technology providers are encouraged. Example entities for partnerships in each of these categories include, but are not limited to, the following:

Research Institutions	Electric Sector Partners	Technology Providers
• An institution of higher education. • Research institutions • Think tanks • National Labs / FFRDCs	• Rural electric cooperatives; • Utilities owned by a political subdivision of a State, such as a municipally owned electric utility; • Utilities owned by any agency, authority, corporation, or instrumentality of one or more political subdivisions of a State; • Investor-owned electric utilities (IOUs) • Electric wire owning and/or operating entities. • Regional transmission organizations and independent system operators	• Technology product provider • Technology developers • Other organizations that develop or deploy energy technology systems

E. Topic Area

This NOFO's single Topic Area seeks applications to conduct Research and Development and Demonstration (RD&D) activities that advance the state of the art for power system uncertainty and risk metrics to help human operators receive actionable information to better understand, predict, prevent, and mitigate cascading failures in power grids. Projects should support at least one of the following subject matter areas:

1. **Risk Analytics**
2. **Cybersecurity and Grid Communications**
3. **Human Factors**

Examples of projects in each subject matter area include, but are not limited to the following:

Risk Analytics

- Advance the state-of-the-art probabilistic risk analysis, and metrics, that reflect both epistemic and aleatory sources of uncertainty in power system operations and planning.
- Push the frontiers of knowledge in risk science that can provide an integrated framework for grid resilience under deep uncertainty[6]
- Characterize and assess centralized vs decentralized (agile/modular) control architecture's response to uncertainty.
- Develop novel assumption-deviation analytics[7] to allow for effective communication of model's underlying assumptions to power system decision-makers.

Cybersecurity and Grid Communications

- Develop advanced methodologies for quantifying cyber risk in electric power grid systems.

[6] Logan, T.M., Aven, T., Guikema, S.D. and Flage, R., 2022. Risk science offers an integrated approach to resilience. Nature Sustainability, 5(9), pp.741-748.

[7] Khorsandi, J. and Aven, T., 2017. Incorporating assumption deviation risk in quantitative risk assessments: A semi-quantitative approach. Reliability Engineering & System Safety, 163, pp.22-32.

- Develop advanced risk and data analytics tools that streamline vulnerability impact assessment across the supply chain, enhance compatibility checks for diverse system patches, and incorporate human factors to optimize decision-making processes in critical patch management, minimizing disruptions and cost-related hesitations in infrastructure maintenance.
- Ensure secure, interoperable communications at the grid edge with distributed energy resources (DER), through data analytics and human-centered design, enhancing integration and resilience across diverse systems and communication protocol spaces.
- Develop a common operating picture between grid operations centers and network operations centers. Assess the extent to which the coupling of grid network data feeds and grid management system data feeds enhance situational awareness, anomaly detection, and response decisions. Develop solutions and guidelines for building the common operating picture and integrating it into grid operator human-machine interfaces.

Human Factors

- Identify topics related to novel market and rate design as well as econometrics of DERs and distributed assets that leverage data analytics and incorporate risks associated with uncertainties in human behavior.
- Characterize, assess, and visualize metrics on power system uncertainty to improve the grid operational human machine interfaces (HMI).

F. Applications Specifically Not of Interest

The following types of applications will be deemed nonresponsive and will not be reviewed or considered (Please also refer to the Responsiveness Review section below):

- Applications that fall outside the technical parameters specified in Background and Purpose above and the Topic Areas section above.
- Applications for proposed technologies that are not based on sound scientific principles (e.g., violates the laws of thermodynamics).
- Projects related to specific components instead of the holistic grid system
- Projects that are deterministic in nature instead of uncertainty informed

G. Statement of Substantial Involvement

DOE anticipates awarding cooperative agreements under this NOFO, which include a statement of DOE's "substantial involvement" in the work performed under the resulting awards. For cooperative agreements, DOE does not limit its involvement to the administrative requirements of the award. Instead, DOE has substantial involvement in the direction and redirection of the technical aspects of the project. DOE's substantial involvement in resulting awards may include the following:

A. DOE shares responsibility with the recipient for the management, control, direction, and performance of the project.
B. DOE may intervene in the conduct or performance of work under this award for programmatic reasons. Intervention includes the interruption or modification of the conduct or performance of project activities.
C. DOE may redirect or discontinue funding the project based on the outcome of DOE's evaluation of the project at the Go/No-Go decision point(s).

D. DOE participates in major project decision-making processes.
E. Reviewing project plans, including as required: project management, testing, cybersecurity, interoperability, data management, and technology transfer/commercialization plan in a timely manner then recommending alternate approaches if the plans do not address critical programmatic objectives.
F. Conducting periodic reviews to ensure adequate progress and that the work accomplishes the program and project objectives. Recommending alternate approaches or shifting work emphasis, if needed.
G. 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.
H. Promoting and facilitating technology transfer activities, including disseminating program results through presentations and publications.
I. Serving as scientific/technical liaison between recipients and other DOE programs.

H. Statutory Authority

The programmatic authorizing statute is:

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

Awards made under this announcement will fall under the purview of 2 CFR Part 200 as adopted and supplemented by 2 CFR Part 910.

IV. Application Content and Form

This section includes application information specific to this NOFO Part 1. Refer to the NOFO Part 2, *Application Content and Form* for standard information that applies to all DOE NOFOs such as formatting and content requirements, and funding restrictions.

A. Summary

The application process includes:

Application Submission Phase	Eligibility for Submission
Concept Paper	Required to be submitted by the specified due date and time to be eligible to submit an application
Application	Must be submitted by the specified due date and time to be eligible for comprehensive merit review.

B. Concept Paper

Each concept paper must be limited to a single concept, technology, or project. The concept paper must conform to the requirements listed below, including the stated page limits.

Section	Page Limit	Description
Cover Page	Included in 5 page limitation	The cover page should include the project title, the specific announcement Topic Area being addressed (if applicable), both the technical and business points of contact (including the Administrative Officer, if applicable), names of all team member organizations, the project location(s), and any statements regarding confidentiality.
Technology Description	Included in 5 page limitation	Applicants are required to succinctly describe: • The proposed technology, including its basic operating principles and how it is unique and innovative; • The proposed technology's target level of performance (applicants should provide technical data or other support to show how the proposed target could be met); • The current state of the art in the relevant field and application, including key shortcomings, limitations, and challenges; • How the proposed technology will overcome the shortcomings, limitations, and challenges in the relevant field and application; • The potential impact that the proposed project would have on the relevant field and application; • How the proposed location of the proposed project will support technology development and long-term success; • The key technical risks/issues associated with the proposed technology development plan; • The impact that DOE funding would have on the proposed project; and • Any potential impacts on Indian Tribes and describe how the applicant would engage with a potentially impacted Indian Tribe(s).
Addendum	Included in 5 page limitation	Applicants are required to succinctly describe the qualifications, experience, and capabilities of the proposed project team, including: • Whether the Principal Investigator (PI) or Lead Project Manager (LPM) 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; • 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; and • Applicants may provide graphs, charts, or other data to supplement their Technology Description.

Total concept paper Maximum Page Limit: 5 pages

DOE makes an independent assessment of each concept paper based on the technical review criteria for Concept Papers described below. DOE will encourage a subset of applicants to submit applications. Other applicants will be discouraged from submitting an application. Please see NOFO Part 2, *Selection and Award Notices—Concept Paper Notifications*.

C. Application Content Requirements

Each application must be limited to a single concept. Applications must conform to the following requirements and must not exceed the stated page limits. Please refer to the NOFO Part 2, *Application Content and Form* for a complete list of application requirements. Detailed guidance on the content and form of NOFO-specific requirements is provided following the Summary of Application Requirements table below.

1. Covered Individual Definition, Designation, and Responsibility

Several of the Application Content Requirements listed below and in the NOFO Part 2 are required of covered individuals.

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

DOE designates as covered individuals any principal investigator (PI); project director (PD); co-principal investigator (Co-PI); co-project director (Co-PD); project manager; and any individual regardless of title that is functionally performing as a PI, PD, Co-PI, Co-PD, or project manager.

In addition, DOE designates technical staff (e.g., postdoctoral fellows/researchers and graduate students) as covered individuals for the purpose of this funding opportunity.

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

2. Summary of Application Requirements

Component	File Format	Page Limit	File Name
Application for Federal Assistance (SF-424)	Form	n/a	N/A
Technical Volume	PDF	[15]	TechnicalVolume.pdf
Letters of Commitment	PDF	1 page each	LOC.pdf
Impacted Indian Tribes Documentation	PDF	n/a	ImpactedTribes.pdf
Statement of Project Objectives	MS Word	[5]	SOPO.doc or .docx
Project Management Plan	PDF	[20]	PMP.pdf
Budget Information Non-Construction Programs (SF-424A)	MS Excel	n/a	SF-424A.xls or .xlsx
Budget Justification Workbook	MS Excel	n/a	Budget_Justification.xls or .xlsx
Subrecipient Budget Justification	MS Excel	n/a	Subrecipient_Budget_Justification.xls or .xlsx
Work Proposal for FFRDC, (see DOE O 412.1A)	PDF	n/a	WP.pdf
Authorization for Non-DOE or DOE FFRDCs	PDF	n/a	FFRDCAuth.pdf
Waiver for Foreign Entity Participation	PDF	n/a	FEW.pdf
Performance of Work in the United States (Foreign Work Waiver)	PDF	n/a	FWW.pdf
Resumes (Research and Development (R&D))	PDF	3 pages each	Resumes.pdf
Current and Pending Support (for each covered individual)	PDF	n/a	CPS.pdf
Digital Persistent Identifier (for each covered individual)	N/A	N/A	Include in Current & Pending Support
Research Security Training Requirement (for each covered individual)	N/A	N/A	Include in Current & Pending Support
Transparency of Foreign Connections	PDF	n/a	BusinessSensitive_TFC.pdf
Potentially Duplicative Funding Notice	PDF	n/a	PDFN.pdf
Data Management Plan	PDF	n/a	DMP.pdf
Project/Performance Site Location(s)	Form	n/a	N/A
Environmental Questionnaire	PDF	n/a	ENV.pdf
Disclosure of Lobbying Activities, if applicable (SF-LLL)	PDF	n/a	SF-LLL.pdf
Certification Regarding Lobbying (OMB 4040-0013)	PDF	n/a	Cert Lobbying.pdf
Summary for Public Release	PDF	1	Summary.pdf

Summary Slide	MS Power Point	1	Slide.pdf

3. Technical Volume

The Technical Volume must conform to the following content and form requirements. This volume must address the technical review criteria as discussed in Technical Review Criteria.

Applicants must provide sufficient citations and references to the primary research literature to justify the claims and approaches made in the Technical Volume. However, DOE and reviewers are under no obligation to review cited sources.

The Technical Volume to the application may not be more than 15 pages, including the cover page, table of contents, and all citations, charts, graphs, maps, photos, or other graphics, and must include all information below. The applicant should consider the weighting of each of the technical review criteria (see Technical Review Criteria) when preparing the Technical Volume.

Cover Page:

The cover page must include all of the following:

- The project title
- Specific NOFO topic areas (if applicable)
- Technical and business POCs (e-mail addresses and telephone numbers)
- Senior/key personnel and other covered individuals
- The project team, including recipient name, entity type and names of all team member organizations
- The project location(s)
- The proposed total federal funding level, cost share and period of performance
- The proposed federal funding level and cost share for each project participant
- Statements regarding confidentiality

A sample Technical Volume Cover Page is included as an attachment to this announcement.

Table of Contents: Applicant to capture, at a minimum, all of the required sections identified in this table.

Project Objectives

This section should provide a clear, concise statement of the specific objectives/aims of the proposed project.

Merit Review Criteria Discussion

The section should be formatted to address each of the merit review criterion and sub criterion listed in "Technical Review Criteria". Provide sufficient information so that reviewers will be able to evaluate the application in accordance with these merit review criteria. DOE will evaluate and consider only those applications that address separately each of the merit review criterion and sub-criterion.

Relevance and Outcomes/Impacts

This section should explain the relevance of the effort to the objectives in the program announcement and the expected outcomes and/or impacts. The justification for the proposed project should include a clear statement of the importance of the project in terms of the utility of the outcomes and the target community of beneficiaries.

Roles of Participants

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

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

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

List important items of equipment already available for this project and, if appropriate, note the location and pertinent capabilities of each. If you are proposing to acquire equipment, describe comparable equipment, if any, already at your organization and explain why it cannot be used.

Identification of Potential Conflicts of Interest or Bias in Selection of Reviewers (Not Included in Page Limitation)

Provide the following information in this section:
Collaborators and Co-editors: List in alphabetical order all persons, including their current organizational affiliation, who are, or who have been, collaborators or co-authors with you on a research project, book or book article, report, abstract, or paper during the 48 months preceding the submission of this application. Also, list any individuals who are currently, or have been, co-editors with you on a special issue of a journal, compendium, or conference proceedings during the 24 months preceding the submission of this application. If there are no collaborators or co-editors to report, state "None."
Graduate and Postdoctoral Advisors and Advisees: List the names and current organizational affiliations of your graduate advisor(s) and principal postdoctoral sponsor(s) during the last 5 years. Also, list the names and current organizational affiliations of your graduate students and postdoctoral associates.

Bibliography (Not included in page limitation)
If applicable: Provide a bibliography for any references cited in the Project Narrative section. This section must include only bibliographic citations.

D. Funding Restrictions

Program-specific funding restrictions applicable to awards funded under this NOFO are identified below. Standard funding restrictions are described in the NOFO Part 2, *Funding Restrictions* section.

Applicable Funding Restrictions		
Title	**Location**	**Additional Information**
Allowable Costs	NOFO Part 2	Applicable to awards made under this NOFO
Pre-Award Costs	NOFO Part 2	Applicable to awards made under this NOFO
Performance of Work in the United States (Foreign Work Waiver Requirement)	NOFO Part 2	Applicable to awards made under this NOFO
Foreign Travel	NOFO Part 2	Foreign Travel is not allowed for awards made under this NOFO
Lobbying	NOFO Part 2	Applicable to awards made under this NOFO
Equipment and Supplies	NOFO Part 2	Purchasing American-made equipment and supplies is applicable to this award.

V. Submission Requirements and Deadlines

There are several one-time actions applicants must take before applying to this NOFO. Some of these may take several weeks, so it is vital applicants build in enough time to complete them. Failure to complete these actions could interfere with application or negotiation deadlines or the ability to receive an award if selected. These requirements are outlined in detail in the NOFO Part 2, *Get Registered*.

A. Required Registrations

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

You must have an active account with SAM.gov. This includes having a Unique Entity Identifier (UEI). SAM.gov registration can take several weeks. To register, go to SAM.gov Entity Registration and click Get Started. From the same page, you can also click on the Entity Registration Checklist for the information you will need to register.

Each applicant must:

1. Be registered in SAM.gov before submitting an application;
2. Provide a valid Unique Entity Identifier in the application; and
3. Continue to maintain an active registration in SAM.gov with current information at all times during which you have an active federal award or an application or plan under consideration by a federal agency.

DOE may not make a federal award to an applicant until the applicant has complied with all applicable UEI and SAM requirements and, if an applicant has not fully complied with the requirements by the time DOE is ready to make a federal award, the DOE will determine that the applicant is not qualified to receive a federal award and use that determination as a basis for making a federal award to another applicant.

2. FedConnect

Register in FedConnect at https://fedconnect.net. For more information about the registration requirements, review the FedConnect Ready, Set, Go! Guide at https://www.fedconnect.net/FedConnect/Marketing/Documents/FedConnect_Ready_Set_Go.pdf. The SAM and UEI must be obtained before this registration can be initiated.

3. Grants.gov

Register in Grants.gov at https://www.grants.gov/register to set up your WorkSpace and to receive automatic updates when amendments to the NOFO are posted. Doing so requires a Login.gov registration as well. An applicant cannot submit an application through Grants.gov unless registered. See step-by step instructions for applicants at How to Apply for Grants website at https://www.grants.gov/applicants/grant-applications/how-to-apply-for-grants.

B. Application Package

1. Grants.gov

The application package requirements are outlined in the Application Content and Form section above. The application package forms for application requirements are included in Grants.gov. The application forms and instructions are available on Grants.gov at https://www.grants.gov/ under the NOFO number identified on the NOFO Cover Page.

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

- TechnicalVolume_Part_1
- TechnicalVolume_Part_2

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

Electronic Authorization of Applications and Award Documents
Submission of an application and supplemental information under this NOFO through electronic systems used by the DOE, including Grants.gov, constitutes the authorized representative's approval and electronic signature.

C. Submission Date and Times

All required submissions must be submitted to the Grants.gov site identified in the Key Facts section of NOFO Part 1 no later than 5 p.m. ET on the dates provided on Key Facts section.
There may be more than one deadline, depending on whether a letter of intent and a concept paper is required.

Applicants are strongly encouraged to submit all required application documents at least 48 hours in advance of the submission deadline. Under normal conditions (i.e., at least 48 hours before the submission deadline), applicants should allow at least one hour to submit application documents. Once the application documents are submitted in the Grants.gov site identified in the NOFO Part 1, applicants may revise or update that submission until the expiration of the applicable deadline. If changes are made to any of these documents, the applicant must resubmit them before the applicable deadline. DOE will not extend the submission deadline for applicants that fail to submit required information by the applicable deadline due to server/connection congestion.

D. Intergovernmental Review

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

VI. Application Review Information

A. Standards for Application Evaluation

Applications that are determined to be eligible will be evaluated in accordance with this NOFO and the guidance provided in the "DOE Merit Review Guide for Financial Assistance," effective October 1, 2020, which is available at: https://energy.gov/management/downloads/merit-review-guide-financial-assistance-and-unsolicited-proposals-current.

B. Responsiveness Review

The following concept papers and applications will be deemed nonresponsive and will not be reviewed or considered:

- Project concepts or approaches not based on established scientific principles.
- Project concepts or approaches identified specifically as NOT of interest (see the Applications Specifically Not of Interest section above).

C. Review Criteria

1. Compliance Criteria

All applicant submissions for concept papers and applications must:

- Comply with the applicable content and form requirements listed in Application Content Requirements and Submission Requirements and Deadlines of the NOFO Part 1 and 2;
- Include all required documents;
- Be uploaded successfully in Grants.gov indicated in the Key Facts section above including clicking the "Submit" button; and
- Comply with the submission deadline stated in Key Facts.

DOE will not review or consider submissions submitted through means other than the Grants.gov site indicated in Key Facts, submissions submitted after the applicable deadline, or incomplete submissions.

If required in the Key Facts section, applicants must submit aa concept paper by 5:00 p.m. ET on the due date listed on the Key Facts section to be eligible to submit an application. If required, applicants who do not submit a concept paper are not eligible to submit an application.

Applicants are strongly encouraged to submit all required application documents at least 48 hours in advance of the submission deadline. Under normal conditions (i.e., at least 48 hours before the submission deadline), applicants should allow at least one hour to submit application documents. Once the application documents are submitted in the Grants.gov site identified in the Key Facts section, applicants may revise or update that submission until the expiration of the applicable deadline. If changes are made to any of these documents, the applicant must resubmit them before the applicable deadline. DOE will not extend the submission deadline for applicants that fail to submit required information by the applicable deadline due to server/connection congestion.

2. Technical Review Criteria

Concept Papers

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

Concept paper Criterion: Overall NOFO Responsiveness and Viability of the Project (Weight: 100%)
This criterion involves consideration of the following factors:

- The proposed work, if successfully accomplished, would clearly meet the objectives as stated in the NOFO.
- The applicant clearly describes the proposed technology, describes how the technology is unique and innovative, and how the technology will advance the current state-of-the-art;
- The applicant has identified risks and challenges, including possible mitigation strategies, and has shown the impact that DOE funding and the proposed project would have on the relevant field and application;
- The applicant has the qualifications, experience, capabilities and other resources necessary to complete the proposed project.

Applications

Applications will be evaluated against the technical review criteria shown below:

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.

Review Criterion Overview	
Criterion	**Weight**
Technical Merit and Innovation	40%
Significance and Impact	25%
Project Execution and Management Approach	15%
Team and Resources	20%

CRITERION 1: TECHNICAL MERIT AND INNOVATION (40%)

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

1. Level of the Applicant's/project team's understanding of the state of existing and emerging technology as indicated by the degree of clarity and thoroughness articulated in the description of the proposed solution/approach.
2. Extent to which the proposed technical concept/project is innovative compared to previous and ongoing work, and existing and emerging approaches and technologies.
3. Extent to which the application clearly and convincingly demonstrates how the proposed technical concept/project will advance the relevant technology beyond the current level of development.
4. Validity/viability of the proposed technical concept/project as evidenced by peer reviewed or collaborated data, and/or results of previous and ongoing work.

5. Degree to which the proposed technical concept/project addresses the key objectives outlined in the NOFO.
6. Adequacy of the technology development strategy to move the technology solution and/or methodology to the next logical stage of RD&D.

CRITERION 2: SIGNIFICANCE AND IMPACT (25%)

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

1. Extent to which the proposed technical concept/project outcomes meets or exceeds the goals or performance targets specified in the NOFO.
2. Degree to which the application clearly and convincingly describes/explains the performance improvement of the proposed technical concept/project over existing and emerging approaches and technologies.
3. Extent of the performance improvement of the proposed technical concept/project over existing and emerging approaches and technologies.
4. Degree to which the application clearly and convincingly conveys broad impacts to the electric power grid sector.
5. Extent to which the proposed approach fosters collaboration and would lead to dissemination of data, results, and lessons learned to relevant entities not immediately involved with the project.

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

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

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

Deliverables Log, which must include each deliverable's title, associated phase/task, and planned completion date.
- Risk Management – extent to which the application identifies and defines the potential risks that may impact project success and the adequacy of the proposed approach to continue to assess and address risks throughout the project.

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

CRITERION 4: TEAM AND RESOURCES (15%)

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

1. Adequacy and appropriateness of the qualifications, expertise, and experience of key personnel and team members.
2. Suitability of the project team that includes expertise from the following groups:
   a. Research Institutions
   b. Energy Sector Partners
   c. Technology Providers
3. Availability of key personnel.
4. (As applicable) The appropriateness, and quality of past peer reviewed publications of key personnel and team members demonstrate the team's technical expertise and past results.
5. Degree of demonstrated experience and past collaboration of the project team in completing comparable efforts that yielded successful technology development and deployment (as applicable).
6. 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.
7. Availability, appropriateness, adequacy, and condition of facilities and equipment.
8. Diverse partnerships that are conducive to inter-disciplinary knowledge generation.

D. Other Selection Factors

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

1. The degree to which the proposed project exhibits technological diversity when compared to the existing DOE project portfolio and other projects selected from the subject NOFO;
2. The degree to which the proposed project, including proposed cost share, optimizes the use of available DOE funding to achieve programmatic objectives;
3. The level of industry involvement and demonstrated ability to accelerate demonstration and commercialization and overcome key market barriers;
4. The degree to which the proposed project is likely to lead to increased high-quality employment and manufacturing in the United States;
5. The degree to which the proposed project will accelerate transformational technological advances in areas that industry by itself is not likely to undertake because of technical and financial uncertainty;
6. The degree to which the proposed project, or group of projects, represent a desired geographic distribution (considering past awards and current applications);
7. The degree to which the proposed project incorporates applicant or team members from Minority Serving Institutions; and partnerships with businesses majority owned or controlled by underrepresented persons or groups of underrepresented persons or Indian Tribes;
8. The degree to which the proposed project will employ procurement of U.S. iron, steel, manufactured products, and construction materials.
9. The degree to which the proposed project contributes to the diversity of organizations and organization types and sizes selected from the subject NOFO when compared to the existing DOE project portfolio.
10. The degree to which the proposed project avoids duplication/overlap with other publicly or privately funded work.
11. The degree to which the proposed project supports complementary efforts or projects, which, when taken together, will best achieve the research goals and objectives.

VII. Selection and Award Notices

Please see the NOFO Part 2, *Selection and Award Notices* for information on notifications for Concept Papers (if applicable), Applications, Award Negotiations, and Post-Selection Information Requests.

VIII. Award Administration Information

A. Post-Award Requirements and Administration

DOE requires all award recipients to follow and accept requirements governed by laws and policies – both federal government-wide and DOE or program specific. These post-award requirements include all National and Administrative Policy Requirements; financial assistance general Certifications and Representations; Fraud, Waste and Abuse requirements; Safety, Security, and Regulatory requirements; and Environmental Review in Accordance with National Environmental Policy Act requirements.

Post-Award requirements and administration applicable to awards funded under this NOFO are identified below. Detailed descriptions of standard funding restrictions are provided in the NOFO Part 2, *Post-Award Requirements and Administration* section. Detailed descriptions of program specific funding restrictions are provided below the table.

Applicable Post-Award Requirements and Administration	
Title	**Location**
Award Administrative Requirements	NOFO Part 2
Subaward and Executive Reporting	NOFO Part 2
National Policy Requirements	NOFO Part 2
Applicant Representations and Certifications	NOFO Part 2
Statement of Federal Stewardship	NOFO Part 2
Uniform Commercial Code (UCC) Financing Statements	NOFO Part 2
Interim Conflict of Interest Policy for Financial Assistance	NOFO Part 2
Whistleblower Protections	NOFO Part 2
Fraud, Waste, and Abuse	NOFO Part 2
Participants and Collaborating Organizations	NOFO Part 2
Current and Pending Support	NOFO Part 2
Prohibition Related to Malign Foreign Talent Recruitment Programs	NOFO Part 2
Foreign Collaboration Considerations	NOFO Part 2
U.S. Manufacturing Commitments	NOFO Part 2
Subject Invention Utilization Reporting	NOFO Part 2
Intellectual Property Provisions	NOFO Part 2
Go/No-Go Review	NOFO Part 2
Conference Spending	NOFO Part 2
Invoice Review and Approval	NOFO Part 2
Cost-Share Payment	NOFO Part 2
Implementation of Executive Order 13798, Promoting Free Speech and Religious Liberty	NOFO Part 2

Affirmative Action and Pay Transparency Requirements	NOFO Part 2
Construction Signage	NOFO Part 2
Human Subjects Research	NOFO Part 2
Real Property and Equipment	NOFO Part 1
Rights in Technical Data	NOFO Part 1

1. Real Property and Equipment

Real property and equipment purchased with project funds (federal share and recipient cost share) are subject to the requirements at 2 CFR 200.310, 200.311, 200.313, and 200.316 (non-federal entities, except for-profit entities) and 2 CFR 910.360 (for-profit entities).

For resulting awards under this NOFO, the recipients may (1) take disposition action on the real property and equipment; or (2) continue to use the real property and equipment after the conclusion of the award period of performance with Grants Officer approval. The recipient's written request for Continued Use must identify the property and include: a summary of how the property will be used (must align with the authorized project purposes); a proposed use period, (e.g., perpetuity, until fully depreciated, or a calendar date when the recipient expects to submit disposition instructions); acknowledgement that the recipient shall not sell or encumber the property or permit any encumbrance without prior written DOE approval; current fair market value of the property; and an estimated useful life or depreciation schedule for equipment.

When the property is no longer needed for authorized project purposes, the recipient must request disposition instructions from DOE. For-profit entity disposition requirements are set forth in 2 CFR 910.360. Property disposition requirements for other non-federal entities are set forth in 2 CFR 200.310 – 200.316. In addition, pursuant to the FY23 Consolidated Appropriations Act (Pub. L. No. 117-328), Division D, Title III, Section 309, at the end of the award period the Secretary or a designee of the Secretary, at their discretion, may vest unconditional title or other property interests acquired under this project regardless of the fair market value of the property.

2. Rights in Technical Data

Data rights differ based on whether data is first produced under an award or instead was developed at private expense outside the award.

"Limited Rights Data": The U.S. government will not normally require delivery of confidential or trade-secret-type technical data developed solely at private expense prior to issuance of an award, except as necessary to monitor technical progress and evaluate the potential of proposed technologies to reach specific technical and cost metrics.

Government Rights in Technical Data Produced Under Awards: The U.S. government normally retains unlimited rights in technical data produced under government financial assistance awards, including the right to distribute to the public. However, pursuant to special statutory authority, certain categories of data generated under DOE awards under this NOFO may be protected from public disclosure for up to five years after the data is generated ("Protected Data"). For awards permitting Protected Data, the protected data must be marked as set forth in the award's intellectual property terms and conditions and a listing of unlimited rights data (i.e., non-protected data) must be inserted into the data clause in

the award. In addition, invention disclosures may be protected from public disclosure for a reasonable time in order to allow for filing a patent application.

3. Cost Share Payment

DOE requires recipients to contribute the cost share amount incrementally over the life of the award. Specifically, the recipient's cost share for each **billing period** must always reflect the overall cost share ratio negotiated by the parties (i.e., the total amount of cost sharing on each invoice when considered cumulatively with previous invoices must reflect, at a minimum, the cost sharing percentage negotiated).

B. Questions and Support

1. Questions

Upon the issuance of a NOFO, DOE personnel are prohibited from communicating (in writing or otherwise) with applicants regarding the NOFO except through the established question and answer process described below. Questions regarding this NOFO must be submitted through the FedConnect portal. The applicant must register with FedConnect to respond as an interested party to submit questions, and to view responses to questions. It is recommended that the applicant registers as soon as possible after release of the NOFO to have the benefit of all responses. Applicants are encouraged to review previously issued Questions and Answers prior to the submission of questions. Questions or comments concerning this NOFO shall be submitted not later than three (3) business days prior to the application due date and time. Please note, feedback on individual concepts will not be provided through Q&A.

All questions and answers related to this NOFO will be posted on the FedConnect portal, listed in the Key Facts section above. DOE will attempt to respond to a question within three (3) business days unless a similar question and answer has already been posted on the website.

Questions related to the registration process, system requirements, how an application form works, or the submittal process must be directed to the Support contacts identified below.

2. Support

Grants.gov

Grants.gov provides 24/7 support. You can call 1-800-518-4726 or email support@grants.gov. Hold on to your ticket number.

SAM.gov

If you need help, you can call 866-606-8220 or live chat with the Federal Service Desk.

FedConnect

If you need help, you can call 800-899-665, Option 2 or submit a ticket at Unison FedConnect Support.

IX. Other Information

Please see the NOFO Part 2, *Other Information* for additional information and requirements that apply to all DOE NOFOs.