

Financial Assistance Notice of Funding Opportunity Part 1



**U.S. Department of Energy (DOE)
Office of Electricity (OE) and Office of Energy Efficiency and
Renewable Energy (EERE)
Renewable Integration Management with Innovative High
Voltage Direct Current Power Circuit Breakers
(REIMAGINE BREAKERS)
Notice of Funding Opportunity Number: DE-FOA-0003396**

Application due: Friday, February 28, 2025, 05:00 PM ET

All modifications to the Notice of Funding Opportunity (NOFO) are HIGHLIGHTED in the body of the NOFO.

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.

I. Basic Information

A. Key Facts

Issuing Agency	Department of Energy, Office of Electricity and Office of Energy Efficiency and Renewable Energy's Wind Energy Technologies Office	KEY DATES Notice of Funding Opportunity Issue Date: December 12, 2024 Concept Paper Deadline: January 17, 2025 Application Deadline: February 28, 2025 Anticipated Selection Notification Date: August 1, 2025 Anticipated Award Date: December 1, 2025 Estimated Period of Performance: December 1, 2025 – November 30, 2028
Funding Opportunity Title	Renewable Integration Management with Innovative High Voltage Direct Current Power Circuit Breakers (REIMAGINE BREAKERS)	
Announcement Type	Initial	
Funding Opportunity Number	DE-FOA-0003396	
Funding Instrument	Cooperative Agreements	
Assistance Listing Number	81.122 Office of Electricity (OE)	
Funding Opportunity Description	Developing standards for High Voltage Direct Current Circuit Breakers (HV DCCB) will support the protection and interoperability of hardware within Multi-Terminal HVDC (MTDC) transmission systems and allow for seamless interconnection and coordination of HV DCCBs into existing high voltage AC & DC transmission systems. Standardization will provide key stakeholders with guidance to ensure all HV DCCBs developed are compatible with existing and future transmission networks. Additionally, the advancement of HV DCCB designs will aid in the development of novel ideas to reduce overall cost and footprint of the technology.	
Program Goals & Objective(s)	The objective of the Announcement is to support R&D that will standardize the technical specifications of high voltage direct current circuit breakers (HV DCCB) as well as advance existing HV DCCB designs for reduced cost and footprint.	
Topic Areas	<ul style="list-style-type: none"> Topic Area 1: Standardization of HVDC Power Circuit Breaker Technology Topic Area 2: Innovative HV DCCB Designs 	
Eligible Applicants	<ul style="list-style-type: none"> Domestic Entities (Institutes of higher education; for-profit entities; non-profit entities; state and local government entities and Indian Tribes) DOE and Non-DOE FFRDCs (excluding NETL) 	

FedConnect URL and Helpdesk	FedConnect NOFO URL FedConnect Helpdesk https://www.fedconnect.net/FedConnect/Default.htm
Grants.gov URL and Helpdesk	Grants.gov URL Grants.gov Support

1. Funding Details

Multiple Topic Areas

Approximate total available funding including all topic areas: \$8,000,000

Topic Area 1: Standardization of HVDC Power Circuit Breaker Technology

- Approximate total available funding: \$1,500,000
- Approximate number of awards: 1
- Approximate dollar amount of individual awards: up to \$1,500,000
- Minimum cost share required: 20% of the Total Project Costs
- Approximate award project period: up to 36 months
- Anticipated length of budget periods: One Continuous with Go/No-Go Decision Point

Topic Area 2: Innovative HVDC Power Circuit Breaker Designs

- Approximate total available funding: \$6,500,000
- Approximate number of awards: 2-3
- Approximate dollar amount of individual awards: up to \$3,250,000
- Minimum cost share required: 20% of the Total Project Costs
- Approximate award project period: up to 36 months
- Anticipated length of budget periods: One Continuous with Go/No-Go Decision Point

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

This NOFO serves as the next action in a series of actions taken by DOE to expand deployment of HVDC transmission technology in the U.S., by investing in standards development and innovative solutions to reduce cost and footprint of HV DCCB technology for widespread use in the U.S. Topic Area 1 aims to expand on the standards development being conducted through DOE FOA 2828's Topic Area 1 by developing technical specifications and operational requirements for HVDC power circuit breakers to the suite of available standards. Topic Area 2 aims to explore potential innovative concepts and designs that can reduce the cost to produce, install, and operate HV DCCB, as well as reduce the footprint of the equipment and improve performance, given that power plant and/or platform space is at a premium,

especially for offshore wind applications. The goal is to build off the work conducted, and lessons learned under the DOE ARPA-E BREAKERS program focused on the development of novel technologies for medium voltage direct current power circuit breakers.

C. Agency Contact Information

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

For questions relating to this specific NOFO, please send emails to DE-FOA-0003396@netl.doe.gov.

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. 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;
- For-profit organization;
- Nonprofit organization;
- State and local governmental entities; and
- Indian Tribes, as defined in section 4 of the Indian Self-Determination and Education Assistance Act, 25 U.S.C. § 5304¹

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.

2. 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

¹ "Indian Tribe," for the purposes of this NOFO and as defined in section 4 of the Indian Self-Determination and Education Assistance Act ([25 U.S.C. § 5304](#)), means any Indian tribe, band, nation, or other organized group or community, including any Alaska Native village or regional or village corporation as defined in or established pursuant to the Alaska Native Claims Settlement Act ([85 Stat. 688](#)) [[43 U.S.C. § 1601, et seq.](#)], which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians. Federally Recognized Indian Tribes are also considered disadvantaged communities for the purposes of Justice40 requirements in this NOFO per https://www.whitehouse.gov/wp-content/uploads/2023/01/M-23-09_Signed_CEQ_CPO.pdf.

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 FFRDCs² 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.

² 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 \(treas.gov\)](https://www.treas.gov/ofac-sanctions-list-service).
- 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 Applications Eligible for Review

An entity may submit more than one concept paper and associated application to this NOFO provided that each describes a unique, scientifically distinct project concept and an eligible concept paper was submitted for each Full Application. An entity may submit multiple concept paper and associated applications for each topic area of this NOFO as long as each application describes a unique, scientifically distinct project. If an entity submits duplicate concept papers and/or 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

The cost share must be at least 20% of the total project costs³ for research and development.⁴

³ Total project costs are the sum of the government share, including FFRDC costs if applicable, and the recipient share of project costs.

⁴ Energy Policy Act of 2005, Pub. L. 109-58, sec. 988. Also see 2 CFR 200.306 and 2 CFR 910.130 for additional cost sharing requirements.

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 under 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.

C. 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 Context

The Department of Energy's (DOE's) National Energy Technology Laboratory (NETL) is seeking applications under this Notice of Funding Opportunity (Announcement), on behalf of the Office of Electricity's (OE) Transformer Resilience and Advanced Components (TRAC) Program and Office of Energy Efficiency and Renewable Energy Wind Energy Technologies Office's (EERE WETO) Systems Integration Program.

OE works to develop new technologies to enhance the infrastructure that brings electricity into our homes, offices, and factories and to improve the federal and state electricity policies and programs that shape electricity system planning and market operations. OE provides national leadership to ensure that the Nation's grid is reliable, resilient, and secure and that the electricity is affordable for everyone.

The Nation's sustained economic prosperity, quality of life, and global competitiveness depend on access to an abundance of secure, reliable, and affordable energy resources. Through a mix of technology and policy solutions, OE is addressing the changing dynamics and uncertainties in which the future electric system will need to operate. OE leverages effective partnerships, solid research, and best practices to support diverse interests in achieving economic, societal, and environmental objectives.

Within OE, the Transformer Resilience and Advanced Components (TRAC) program supports modernization and resiliency of the grid by addressing the unique challenges of grid hardware technologies that are responsible for carrying and controlling electricity from where it is generated to where it is needed.

OE's partner on this NOFO, WETO, invests in wind energy research, development, and demonstration activities that enable and accelerate the innovations needed to advance offshore, land-based, and distributed wind systems; reduce the cost of wind energy; drive deployment in an environmentally conscious manner; and facilitate the integration of high levels of wind energy with the electric grid.

WETO's goal in renewable systems integration is to remove barriers to enable system planners and operators, via innovation, to capture the economic and environmental benefits of the increasing availability of wind energy, while ensuring overall system reliability, resiliency, and security. This can be accomplished through system studies, data, models, tools development, and validation and field demonstrations, coupled with working directly with stakeholders, including utilities, to help ensure adoption of best practices.

In May 2022, WETO and OE co-hosted a three-day HVDC Workshop that brought together key stakeholders to both discuss the current state-of-the-art of HVDC systems and identify research gaps that need to be filled to advance the technology for renewable integration. Some of the critical gaps identified include the development and advancement of standards to aid in the manufacturability and interoperability of HVDC systems, the R&D of wide bandgap semiconductor devices and other technologies to increase the power capacity of the technology, and the improvement of HVDC power circuit breakers for fault protection on the HVDC system.

The HVDC workshop informed Topic Area (TA) 1 (High-Voltage Direct Current for Offshore Wind Transmission) of WETO's [DE-FOA-0002828](#) (Bipartisan Infrastructure Law (BIL)) FOA to Address Key Deployment Challenges for Offshore, Land-Based, and Distributed Wind) that was released in December of 2022. Relevant subtopics under TA 1 included HVDC standardization and benchmark system development (TA 1a), MTDC basic controls and functional requirements development (TA 1b), and curriculum creation for education and workforce development (TA 1c). OE also released a HVDC American-Made Prize in March 2023 to promote "new innovative solutions to technical challenges in HVDC through the development of new hardware, controls, and advanced concepts."

In the [relevant House Report to the 2023 Consolidated Appropriations Act](#), DOE was directed to initiate a HVDC "moonshot" initiative to reduce the cost of HVDC technology. This directive prompted targeted information gathering and a stakeholder workshop to collect baseline cost figures and barriers to widespread adoption of HVDC systems. Through these activities, DOE established a [goal](#) to reduce the combined capital, operating, and maintenance cost of VSC HVDC systems by 35% by 2035. The target annual levelized cost of HVDC substations is \$210/MW/kV by 2035.

Building on the knowledge gained from the previous workshops and studies, FOA 3141 Innovative DEsigns for high-performAnce Low-cost HVDC Converters (IDEAL HVDC) was released with the goal to increase R&D in voltage source converter substations in support of the broader HVDC CORE initiative. More information regarding project selections can be found [here](#).

In May 2024, WETO and OE co-hosted a direct current power circuit breaker workshop convening key stakeholders to discuss the challenges and gaps in HV DCCB technology inhibiting widespread adoption of MTDC transmission systems in the U.S. Information from the workshop can be found [here](#). The following areas were identified as best suited for DOE to lead: standardization of HV DCCB technology, development of disruptive technologies to advance the industry, execution of pilot demonstrations to showcase technology capabilities, and investment in testing facilities to ensure reliability of the system. This NOFO aims to address gaps in standardization and development of innovative HV DCCB technologies.

OE and WETO also coordinate HVDC activities with other DOE offices such as Grid Deployment Office's recent funding opportunity to enable [Standardization for Interregional Offshore Transmission](#) and ARPA-E's latest announcement to develop [Disruptive DC Converters for Grid Resilient Infrastructure to Deliver Sustainable energy \(DC-GRIDS\)](#).

B. Program Goals and Objectives

This NOFO seeks applications to support R&D that will standardize the technical specifications of high voltage direct current circuit breakers (HV DCCB) as well as advance existing HV DCCB designs. Developing standards for HV DCCBs will support the protection and interoperability of hardware within MTDC transmission systems and allow for seamless interconnection and coordination of the technology into existing HV AC & DC transmission systems. Standardization will provide key stakeholders with guidance to ensure all HV DCCBs developed are compatible with existing and future transmission networks. Additionally, the advancement of HV DCCB designs will aid in the development of novel ideas to reduce overall cost and footprint of the technology.

Detailed technical descriptions of the specific Topic 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, OE and EERE will 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. Topic Areas

Topic Area 1 – Standardization of HVDC Power Circuit Breaker Technology

This topic area aims to further the work of DE-FOA-0002828 and IDEAL-HVDC and address a key gap in the HVDC protection through the development of HV DCCB technical standards. Successful proposals will consider the following when developing a plan to generate HV DCCB standards:

- Fault clearing needs for point-to-point and multi-terminal HVDC systems
- Robust understanding of existing state-of-the-art HV DCCB technology and familiarity of current activities at IEEE, IEC, or CIGRE on DC switching gears
- Gaps in developing a set of standards for the technology
- Understanding of HVAC power circuit breaker standards (such as IEEE C37 and IEC 62271 series) to inform HV DCCB standards
- Needed studies to define functional requirements or technical specifications
- Key stakeholders to include in standards development to drive consensus and adoption
- Coordination with the awardee for FOA 2828 Topic Area 1a and plan to add on to and not compete with the standards developed through that work

1. Specific Requirements:

- i. The proposed project must develop vendor neutral HVDC power circuit breaker standards.
- ii. The standards should include standard functional requirements such as
 - a. **Rated voltage,**
 - b. **Interrupting time,**
 - c. **Peak fault interrupting current rating,**
 - d. **Peak voltage rating,**
 - e. **Insulation level,**
 - f. **Continuous, short term, and peak withstand current ratings,**
 - d. **Bidirectionality of current interruption,**
 - e. **Multiple open/close operation times,**
 - f. **Losses**
- iii. The standard should include interfaces with DC converters.
- iv. Standards should also address multi-vendor interoperability of HVDC grid protection.
- v. The scope of work proposed should include conducting gap analysis on existing standards and initiating a path towards filling the gaps, such as initiating a Project Authorization Request (PAR38) with IEEE.
- vi. The proposed work can be in the form of a roadmap with a timeline and action plan.
- vii. Applicants should clearly describe the organizations that they anticipate approaching to modify rules and standards.
- viii. The proposal should identify the expected timeframe for approval by the organization along with steps necessary from proposed change to approved implementation.

2. Teaming arrangement:

- i. Provide a description of the project team with clear descriptions of each team member's role in the project. WETO and OE emphasize increasing diversity of research staff, increasing diversity

- of voices in research design, and increasing quantification and emphasis on supporting underserved communities.
- ii. It is preferred that the project team include Principal Investigators from multiple research organizations and include academic representation, where strong consideration should be appropriately given to Minority Serving Institutions.
- iii. It is required to partner with industry members from at least one of the following groups: original equipment manufacturers, consultants, electric utilities, and/or system operators.
- iv. **Coordination with existing HVDC standards effort is encouraged.**
- v. Include letters of support clearly indicating each team member or advisor's role in the proposed project and the support of their organization.

Topic Area 2 – Innovative HV DCCB Designs

This topic area aims to explore potential innovative concepts and designs that can improve performance, reduce the cost to produce, install, and operate HV DCCB technology as well as reduce the footprint of the equipment, given that power plant and/or platform space is at a premium especially for offshore wind applications. Applicants are encouraged to build from DOE [ARPA-E's BREAKERS](#) program, which focused on developing novel technologies for medium voltage DCCBs, and address unique challenges for HV DCCBs in this NOFO.

Cost reduction can be achieved through a number of routes that will be left up to the proposer to evaluate. Some example areas to investigate include but are not limited to:

- Power Electronic Building Blocks to increase modularity of designs
- Size and weight reduction
- Packaging innovations
- Thermal management innovations
- Voltage Limit
- Operation speeds
- Life span of the technology

1) Specific Requirements:

- a) Applicants are required to:
 - i) Describe the current state-of-the-art and the baseline on which the proposed design will improve;
 - ii) Propose an innovative, scalable, and manufacturable HV DCCB design that matches or improves upon the design characteristics of an existing commercially available product (350 kV, 25 kA interruption current, 3 ms operation time). Designs should also be flexible to meet forth coming standards developed through Topic Area 1 of this FOA.
 - iii) Through simulation, emulation, or other analytic approaches, validate that the proposed design(s) can achieve at least 10% of performance improvements in a real-world adjacent scenario as compared to the baseline established;
 - iv) Provide a cost breakdown of how the innovation will reduce overall lifetime HVDC power circuit breaker costs; and
 - v) Develop a plan to kickstart the next phase of development for the technology if the design is deemed feasible.
- b) Applications are highly encouraged to:
 - i) Develop a scalable prototype at the component or subcomponent level where applicable; and

- ii) Incorporate considerations for offshore wind substations including, but not limited to:
 - (1) Designs that address size and platform constraints,
 - (2) Designs that address offshore specific cost constraints, and
 - (3) Designs that address unique cooling constraints
2. Teaming arrangement:
 - i. Provide a description of the project team with clear descriptions of each team member's role in the project. WETO and OE emphasize increasing diversity of research staff, increasing diversity of voices in research design, and increasing quantification and emphasis on supporting underserved communities.
 - ii. It is preferred that the project team include Principal Investigators from multiple research organizations and include academic representation, where strong consideration should be appropriately given to Minority Serving Institutions.
 - iii. Include relevant industry members from one or more of the following groups: original equipment manufacturers, consultants, electric utilities, and/or system operators. Teaming partnerships are highly recommended.
 - iv. It is highly encouraged to coordinate with the standards development team from Topic Area 1 to help inform design decisions.
 - v. Include letters of support clearly indicating each team member or advisor's role in the proposed project and the support of their organization.

E. 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 Context](#) 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).
- Standards for other HVDC equipment such as converters or transformers.
- Standards that go beyond those for HV DCCBs.
- Applications that solely focused on development of new protection schemes.

F. 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.

G. Statutory Authority

The programmatic authorizing statute are:

- PL 95-91, DOE Organization Act, 42 U.S.C. § 7101., et seq. as amended;
- PL 109-58, Energy Policy Act of 2005, 42 U.S.C. § 15801., et seq. as amended;
- PL 116-260, The Energy Act of 2020, div. Z, title III, § 3003 as codified at 42 U.S.C. 16237; and
- PL 110-140, Energy Independence and Security Act of 2007, § 1304 as codified at 42 U.S.C. § 17384.

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	1 page maximum	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	2 pages maximum	Applicants are required to succinctly describe: <ul style="list-style-type: none"> The proposed technology, including its basic operating principles and how it is unique and innovative; 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; The key technical risks/issues associated with the proposed technology development plan;
Addendum	1 pages maximum	Applicants are required to succinctly describe the qualifications, experience, and capabilities of the proposed project team, including: <ul style="list-style-type: none"> 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;

		<ul style="list-style-type: none"> • 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.
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Total concept paper Maximum Page Limit: 4 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, a 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 as 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. Status as a consultant, graduate (master's or PhD) student, or postdoctoral associate does not automatically disqualify a person from being designated as a "covered individual" if they meet the definition in (a) above.

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

The applicant's submission of a current and pending support disclosure and/or biosketch/resume for a particular person serves as an acknowledgement that DOE designates that person as a covered individual.

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

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
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
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.

The Technical Volume should clearly describe and expand upon information provided in the concept paper.

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 Project Narrative 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/NNSA will evaluate and consider only those applications that address separately each of the merit review criterion and sub-criterion.

Statement of Project Objectives

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.

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 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 50MB. Files larger than 50MB cannot be uploaded and hence cannot be submitted for review. If a file is larger than 50MB 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 50MB.

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.

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 applicant clearly describes the proposed technology, 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 of the technology, regulatory and financial aspects of the proposal 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; and
- The proposed work, if successfully accomplished, would clearly meet the objectives as stated in the NOFO.

Applications

Applications will be evaluated against the technical review criteria shown below. All sub-criteria are of equal weight.

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
Criterion 1: TECHNICAL MERIT AND INNOVATION	30%
Criterion 2: SIGNIFICANCE AND IMPACT	30%
Criterion 3: PROJECT EXECUTION AND MANAGEMENT APPROACH	20%
Criterion 4: TEAM AND RESOURCES	20%

Criterion 1: TECHNICAL MERIT AND INNOVATION (30%)

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 Announcement.

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 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 Announcement.
6. Adequacy of the technology development strategy to move the technology solution and/or methodology to the next logical stage of RD&D.

7. Adequacy and completeness of the approach to address interoperability and cyber security concerns associated with integration of the proposed technical concept/project into the existing environment.

Criterion 2: SIGNIFICANCE AND IMPACT (30%)

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 energy delivery systems in a cost-effective manner.

1. Extent to which the proposed technical concept/project meets or exceeds the goals specified in the Announcement and adequacy of the discussion that substantiates the research gap(s) that this project intends to address.
2. Magnitude of the cost-effectiveness and/or performance improvement of the proposed technical concept/project over existing and emerging approaches and technologies.
3. Degree to which the applicant's approach clearly and convincingly conveys the potential for broad adoption and sustainable use of the proposed technical concept/project.
4. Degree to which the applicant's approach clearly and convincingly conveys the potential extent of the expected adoption of the proposed technical concept/project.
5. Degree to which the applicant's approach clearly and convincingly conveys the potential extent to which the proposed approach fosters collaboration and would lead to dissemination of 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 Announcement 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:
 - a) **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.
 - b) **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.
 - c) **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.
 - d) **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.
 - e) **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.
- f) **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:
- a) **Objectives** – extent to which the overall objectives of the project, and the objective for each phase of work (if applicable), are clearly described.
 - b) **Scope of Project** – appropriateness of the focus and effort to achieve the objectives of the proposed technical concept/project.
 - c) **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.
 - d) **Technical Deliverables** – appropriateness of proposed deliverables (beyond those required by this Announcement) and their relevance to the corresponding task.
 - e) **Briefings/Technical Presentations** – appropriateness of the Applicant's planned briefing(s) and/or technical presentation(s).

Criterion 4: TEAM AND RESOURCES (20%)

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

1. Adequacy and appropriateness of the qualifications, expertise, and experience of key personnel and team members.
2. Availability of key personnel.
3. Degree of demonstrated experience and past collaboration of the project team in completing comparable efforts that yielded successful technology research & development and demonstration (as applicable).
4. Level of dedication of the project team as demonstrated by letters of commitment that clearly identify each participant's role, contribution, and/or amount of proposed cost share.
5. Availability, appropriateness, adequacy, and condition of the R&D and demonstration facilities and equipment.

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.

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; Build America, Buy America requirements; Davis-Bacon Act requirements; Bipartisan Infrastructure Law-Specific Requirements; 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
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.