Financial Assistance
Notice of Funding Opportunity Part 1

U.S. DEPARTMENT *of* ENERGY

Department of Energy (DOE)
Office of Fossil Energy and Carbon Management Improving Efficiency, Reliability, and Flexibility of Coal-Based Power Plants
Notice of Funding Opportunity Number: DE-FOA-0003606

Application due: January 23, 2026 (*no later than 5:00 p.m. ET*)

MODIFICATIONS

Modification No.	Date	Description of Modification
000001	11/17/2025	Clarifications to Section(s) IV.C.2. Summary of Application Requirements and IV.C.3. Technical Volume
000002	12/02/2025	Clarifications to Section(s) II.D.1. DOE and Non-DOE FFRDCs as a Subrecipient and Section IV.A. Use and Disclosure of Application Information
000003	1/6/2026	Clarifications to Sections III.B, D., and E. regarding Topic Area Requirements and extend the Application Due Date.

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

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Before You Begin

Navigating the Notice of Funding Opportunity

To reduce the burden on applicants in the Notice of Funding Opportunity (NOFO) process and limit the length of the NOFO information requests 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 3.0

I. Basic Information

A. Key Facts

Issuing Agency	Department of Energy, Office of Fossil Energy and Carbon Management (FECM)
Funding Opportunity Title	Improving Efficiency, Reliability, and Flexibility of Coal-Based Power Plants
Announcement Type	Initial
Funding Opportunity Number	DE-FOA-0003606
Funding Instrument	Cooperative Agreements
Assistance Listing Number	81.089
Funding Opportunity Description	The purpose of this NOFO is to seek applications for projects to design, implement, test and validate three compelling opportunities (here-in-after "topic areas") for strategic refurbishment/retrofit of existing coal power plants, providing a path for rapid and cost-effective restoration of stability to the nation's bulk power system while supporting the nation's industrial and energy security priorities by enabling coal powered systems to provide reliable, secure, and affordable electricity delivered in the near term at scale. Successful projects will lead to the implementation of transformational technologies that will significantly improve the efficiency, effectiveness, costs, emissions reductions, and environmental performance of coal and natural gas use.
Program Goals & Objective(s)	The Office of Fossil Energy and Carbon Management funds research, development and demonstration activities targeting technologies that can significantly improve efficiency, effectiveness, costs, and performance of coal and natural gas use in power, manufacturing and industrial facilities. These investments will foster U.S. energy dominance, continue energy security, and enable U.S. competitiveness in global markets.

KEY DATES

Notice of Funding Opportunity Issue Date:
October 31st, 2025

Application Deadline:
January 23rd, 2026
(no later than 5:00 p.m. ET)

Anticipated Selection Notification Date:
May 2026

Anticipated Award Date:
July 2026

Estimated Period of Performance:
Phase I: July 2026 – July 2027

Topic Areas	• Topic Area 1: Development and Implementation of Advanced Wastewater Systems • Topic Area 2: Engineering and Implementation of Dual Firing Retrofits • Topic Area 3: Development and Testing of Natural Gas Cofiring Systems
Eligible Applicants	• Domestic Entities (Institutes of higher education; for-profit entities; non-profit entities; state and local government entities and Indian Tribes • DOE FFRDC's and non-DOE FFRDCs and Federal Research Agencies
eXCHANGE URL and Helpdesk	NETL eXCHANGE: Funding Opportunities NETL-ExchangeSupport@hq.doe.gov

1. Funding Details

Approximate total available NOFO funding: $100,000,000 federal share

Topic Area 1: Development and Implementation of Advanced Wastewater Systems

- Approximate total available federal funding: $50 million
- Approximate number of awards: 0-5
- Approximate federal dollar amount of individual awards: $400,000 to $50 million total across three phases with a competitive downselect between Phase I and Phase II:
  - *Phase I: $400,000 federal share*
  - *Phase II + Phase III: up to $48 million federal share*
- Minimum cost share required: *Phase I and Phase II: 20%; Phase III: 50%*
- Approximate total award project period (inclusive of all Phases): Up to 60 months
- Anticipated length of phases: 12 months (Phase I), 12 months (Phase II), and up to 36 months (Phase III)

Topic Area 2: Engineering and Implementation of Dual Firing Retrofits

- Approximate total available federal funding: $25 million
- Approximate number of awards: 0-5
- Approximate federal dollar amount of individual awards: $400,000 to $25 million total across three phases with a competitive downselect between Phase I and Phase II:
  - *Phase I: $400,000 federal share*
  - *Phase II + Phase III: up to $23 million federal share*
- Minimum cost share required: *Phase I and Phase II: 20%; Phase III: 50%*
- Approximate total award (inclusive of all Phases): Up to 60 months
- Anticipated length of phases: 12 months (Phase I), 12 months (Phase II), and up to 36 months (Phase III)

Topic Area 3: Development and Testing of Natural Gas Cofiring Systems

- Approximate total available federal funding: $25 million
- Approximate number of awards: 0-5
- Approximate federal dollar amount of individual awards: $400,000 to $25 million total across three phases with a competitive downselect between Phase I and Phase II:
  - *Phase I: $400,000 federal share*
  - *Phase II + Phase III: up to $23 million federal share*
- Minimum cost share required: *Phase I and Phase II: 20%; Phase III: 50%*
- Approximate total award (inclusive of all Phases): Up to 60 months
- Anticipated length of phases: 12 months (Phase I), 12 months (Phase II), and up to 36 months (Phase III)

2. Period of Performance

DOE anticipates making awards comprised of multiple phases. If applicable, project continuation will be contingent upon DOE's downselect and Go/No-Go decision processes. For a complete list and more information on the Go/No-Go review, see the NOFO Part 2, *Award Administration Information*. Funding for all phases, including the initial phase, is not guaranteed.

FECM anticipates Phase I awards will run for 12 months, but work must be completed within the first 9 months to allow for the down select process, anticipated to take up to 3 months. FECM anticipates a 12 month period of performance for Phase II, with an associated Go/No-Go Decision process/review between Phase II and Phase III. FECM anticipates up to 36 months for Phase III activities.

B. Executive Summary

The United States is confronting an urgent energy capacity crisis. DOE's *2025 Resource Adequacy Report (DOE/GR-2025-001)*[1] confirmed that the rapid retirement of firm thermal generation has outpaced the deployment of replacement resources capable of delivering necessary grid services. These challenges are especially acute in regions with constrained transmission and sustained load growth. In January 2025, Executive Order 14156, *Declaring a National Energy Emergency*, directed DOE and other Federal agencies to use their full and lawful authority to preserve and restore statutory authority to ensure reliable, affordable, and secure generation capacity.[2]

The operational strain created by the increasing penetration of intermittent renewables, insufficient compensation in markets and onerous environmental compliance costs, has forced thermal units to cycle beyond their designed parameters, accelerating wear and raising the risk of forced outages and blackouts. This reliability emergency coincides with surging demand from national defense installations, semiconductor fabrication plants, Artificial Intelligence (AI) data centers, critical mineral processing, and industrial re-shoring, all of which require access to power.

[1] U.S. Department of Energy, *Resource Adequacy Report: Evaluating the Reliability and Security of the United States Electric Grid* (July 7, 2025), https://www.energy.gov/sites/default/files/2025-07/DOE Final EO Report %28FINAL JULY 7%29.pdf.

[2] *See* Exec. Order No. 14156 of Jan. 20, 2025, *Declaring a National Energy Emergency*, 90 Fed. Reg. 8433 (Jan. 29, 2025), https://www.federalregister.gov/documents/2025/01/29/2025-02003/declaring-a-national-energy-emergency.

Coal-fired facilities, long central to U.S. energy security, are affordable, reliable, secure, and uniquely positioned to deliver near-term reliability at scale. Specifically, the United States possesses a substantial fleet of nearly 200 gigawatts (GW) of coal-fired power plants currently in operation. A significant portion of this capacity, approximately 100 GW, presents a compelling opportunity for strategic refurbishment, providing a path for rapid and cost-effective restoration of stability to the nation's bulk power system while supporting the nation's industrial and energy security priorities.

C. Teaming Partner List

DOE is compiling a Teaming Partner List to facilitate the formation of project teams for this NOFO. The Teaming Partner List allows organizations that may wish to participate on a project to express their interest to other applicants and explore potential partnerships.

The Teaming Partner List will be available on eXCHANGE and will be regularly updated to reflect new teaming partners who provide their organization's information.

SUBMISSION INSTRUCTIONS: View the Teaming Partner List by visiting the eXCHANGE homepage and clicking on "Teaming Partners" within the left-hand navigation pane. This page allows users to view published Teaming Partner Lists. To join the Teaming Partner List, submit a request within eXCHANGE. Select the appropriate Teaming Partner List from the drop-down menu, and fill in the following information: Investigator Name, Organization Name, Organization Type, Topic Area, Background and Capabilities, Website, Contact Address, Contact Email, and Contact Phone.

DISCLAIMER: By submitting a request to be included on the Teaming Partner List, the requesting organization consents to the publication of the above-referenced information. By facilitating the Teaming Partner List, DOE is not endorsing, sponsoring, or otherwise evaluating the qualifications of the individuals and organizations that are identifying themselves for placement on this Teaming Partner List. DOE will not pay for the provision of any information, nor will it compensate any applicants or requesting organizations for the development of such information.

D. Agency Contact Information

Office of Fossil Energy and Carbon Management
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-0003606@netl.doe.gov.

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; (See Title 20 U.S.C. § 1001 for the definition);
- 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. § 5304[3]

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.

Participant Limitations

Participation of the following entities are limited as follows.

- DOE FFRDCs[4] are eligible to apply for funding as a subrecipient but are not eligible to apply as a recipient.

[3] "**Indian Tribe**," for the purposes of this NOFO and as defined in 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.

[4] 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/.

- 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.

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 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.

3. 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.

4. 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 Applications Eligible for Review

An entity may submit more than one application to this NOFO, provided that each application describes a unique, scientifically distinct project.

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 costs[5] for Phase I and Phase II research and development projects[6] and 50% of the total project costs for Phase III demonstration and commercial application projects.[7]

2. Unallowable Cost Share Sources, NOFO Specific

There are no unallowable cost share sources specific to this announcement. Refer to NOFO Part 2, Eligibility--*Cost Sharing, Unallowable Cost Share Sources* for unallowable cost share sources applicable to all NOFOs.

D. FFRDC Eligibility Criteria

1. 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~~ prior to any award. The use of a FFRDC must be consistent with the contractor's authority under its award.

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

[6] 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.

[7] 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.

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.

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.

Limit on FFRDC Effort

The FFRDC effort, in aggregate, shall not exceed 15% of the total project cost.[88]

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

III. Program Description

A. Program Purpose

FECM is issuing this Notice of Funding Opportunity (NOFO). Under Sec. 961 of the Energy Policy Act of 2005, FECM is responsible for carrying out research, development, demonstration, and commercial application programs in fossil energy with the goal of improving the efficiency, effectiveness, and environmental performance of fossil energy production, upgrading, conversion, and consumption. 42 U.S.C. 16291. Additionally, under Sec. 962 of the Energy Policy Act of 2005, FE is responsible for carrying out the Carbon Capture Technology Program, under which DOE may take into consideration "increasing the performance of coal electric generation facilities and natural gas electric generation facilities" and "reducing the use, and managing the discharge, of water in power plant operations." 42 U.S.C. 16292(b)(3)(A) and (C)(ii). The Topic Areas (TA) of this NOFO align with these authorities and support the development of transformational technologies that will significantly improve the efficiency, effectiveness, costs, emissions reductions, and environmental performance of coal and natural gas use, including in manufacturing and industrial facilities.

Activities executed through this NOFO are intended to facilitate the development of transformational wastewater management systems, dual firing retrofits, and natural gas cofiring systems for coal-fired facilities with a compelling opportunity for strategic refurbishment. Achieving this goal would help enable a rapid and cost-effective path to ensuring affordable, reliable, secure power at scale to address the surging energy demand from national defense installations, semiconductor fabrication plants, AI data centers, critical mineral processing, and industrial re-shoring, all of which require access to power.

B. Program Goals and Objectives

The fossil power generation industry has observed a shift from coal toward natural gas firing, largely driven by increasing costs to maintain and operate the Nation's aging fleet of coal-fired facilities coupled with sustained low natural gas prices. Managing the significant amounts of coal combustion residuals (CCRs) generated by combusting coal and other regulated waste streams often represent a significant operating and maintenance cost of coal-fired electricity generation. However, technologies capable of economically treating regulated waste streams in a manner that enables enhanced recovery of water and other commercial byproducts present an opportunity to improve the economic competitiveness of coal-fired power plants. Moreover, increasing the fuel flexibility of coal-fired electricity generators to enable rapid fuel switching between coal and natural gas provides an attractive option to maintain the many favorable system reliability and resiliency attributes that coal-fired electricity generators provide while at the same time addressing the need for fossil-fueled (coal and natural gas) electricity generation to adapt to rapidly evolving market demands.

Prepare the existing coal fleet for future Carbon Capture Utilization and Storage (CCUS) retrofit. The CCUS conceptual design should include an overview of proposed CO_2 capture strategies, project integration approaches, preliminary specifications and costs, key design features to maximize economic viability, and a justification for the recommended technology. If applicable, specific plans for utilization, injection strategies, and the associated economic benefit should also be discussed. The outcome is a baseline concept suitable for Pre-FEED and FEED studies.

The purpose of this NOFO is to seek applications for projects to design, implement, test and validate three strategic opportunities for refurbishment/retrofit of existing coal power plants. TA's under this NOFO include:

- **TA1: Development and Implementation of Advanced Wastewater Management Systems** – This TA is focused on the development, engineering, and implementation of transformational wastewater management systems capable of cost-effective recovery of water and other value-added byproducts from wastewater streams. Technologies under this topic area are anticipated to facilitate the development of transformational wastewater management systems for improved environmental performance by reducing the use and managing the discharge of water in power plant operations supported by a CCUS conceptual design to reduce CO2 emissions while providing additional revenue opportunities via enhanced oil and/or natural gas recovery (EOR/EGR). Successful implementation will allow coproduction of value-added products to diversify coal plant operators' revenue streams. Concepts that include carbon utilization are preferred over approaches that solely implement carbon capture and storage. The CCUS concept should consider water management strategies, relevant laws and regulations governing key aspects of CCUS integration such as water processing, solvent regeneration, equipment cooling, and process integration.

- **TA2: Engineering and Implementation of Dual Firing Retrofits** – This TA is focused on engineering, design, and implementation of retrofit systems for existing coal plants that enable automatic switching between coal and natural gas without compromising critical operational parameters. Technologies advanced under this topic area are anticipated to facilitate the development of transformational systems for providing increased fuel flexibility to enable transition between coal-firing and gas-firing in power plant operations supported by a CCUS conceptual design to reduce CO2 emissions while providing additional revenue opportunities via enhanced oil and/or natural gas recovery (EOR/EGR). Successful implementation will ~~allow reduction of~~ reduce emissions ~~and optimization of~~ while optimizing operational costs, providing enhanced competitiveness during periods of fuel price volatility. Concepts that include carbon utilization are preferred over approaches that solely implement carbon capture and storage.

- **TA3: Development and Testing of Natural Gas Cofiring Systems** – This TA is focused on development, engineering, and implementation of transformational coal-natural gas co-firing systems and system components (including highly fuel flexible burner designs coupled with advanced control systems) supported by a CCUS conceptual design to reduce CO2 emissions while providing additional revenue opportunities via enhanced oil and/or natural gas recovery (EOR/EGR). Technologies advanced under this topic area ~~that~~ are intended to provide a low cost retrofit option that ~~can~~ enables coal plants to maximize gas co-firing capability ~~while optimizing~~ and emissions ~~and minimizing~~ reduction with minimal efficiency penalties. Successful implementation will enhance the economic viability of coal plants while at the same time achieving improved environmental performance. Concepts that include carbon utilization are preferred over approaches that solely implement carbon capture and storage.

Once successful, projects resulting from this NOFO are anticipated to support a path for rapid and cost-effective restoration of stability to the nation's bulk power system while at the same time supporting the nation's industrial and energy security priorities enabling improvements in coal powered system performance, efficiency, and cost of electricity.

This NOFO seeks applications that advance technologies currently at Technology Readiness Level (TRL) 7 (Full-scale, similar (prototypical) system demonstrated in relevant environment) or higher and projects applying to this NOFO should have sufficient technical detail to support a minimum TRL 7. Successful projects are expected to validate technology cost and performance through operational testing at commercially relevant scale such that subject technologies will achieve TRL 8 (Actual system completed and qualified through test and demonstration) or higher.

The NOFO will be carried out in three phases, with a down-select between Phase I and Phase II and a go/no-go decision point between Phase II and Phase III.

Phase I (Project Definition and Preliminary Design and Engineering) will be aimed at supporting recipients' efforts to secure team commitments (including host sites and recipient cost share for Phase II and Phase III), complete a preliminary front-end engineering and design study (pre-As) including cost estimate and schedule for design, construction, and operation, and complete an environmental information volume (EIV).

Projects selected for Phase II (Final Engineering and Detailed Design) will secure a commitment from an Engineering Procurement Contractor (EPC), complete a Front-End Engineering Design (FEED) study, secure construction/operation cost share funding, and complete the National Environmental Policy Act (NEPA) process required for demonstration and validation.

Project(s) that meet the go/no-go decision point criteria to proceed onto Phase III (Technology Implementation and Validation) will support implementation and testing at coal facilities. Testing and validation of operating systems is necessary to reduce the technical and financial risk associated with the adoption of a new technology in the marketplace. While the scale is dependent on the type of technology being deployed, applicants to this NOFO should have already experienced technical success of the integrated components to the extent that the next step is a commercial demonstration. The projects supported by this NOFO will be used to demonstrate the scalability and commercial potential of strategic coal technologies, helping mitigate risk associated with marketplace adoption.

While only detailed Phase I applications are being solicited at this time, information relating to preliminary plans to carry out Phases II and III will be required to assess the potential viability of the overall project.

Only Phase I recipients will be afforded the opportunity to submit a Phase II application for consideration under the competitive down-selection process outlined in this NOFO.

At a minimum, at the end of Phase I (all TAs), it is anticipated that the recipients accomplish the following:

- Completed pre-FEED for the upgraded coal electric generation facility, with an Association for the Advancement of Cost Engineering (AACE) Class 4 cost estimate (pre-FEED guidelines provided in eXCHANGE listed under the "Documents" Section).
- Select an appropriate site for construction and/or hosting of the demonstration.
- Received host site commitment letter from the selected host site.
- Completed Environmental Information Volume (EIV) to assess any NEPA-related issues at the selected site. The purpose of the EIV is to initiate analysis of the selected host site from a NEPA perspective. Phase II recipients will complete the NEPA process so that demonstration and validation efforts can begin immediately for those projects selected for Phase III. In order to prepare for this, after Phase I recipients select the preferred host site, a completed EIV, that provides all initial environmental data and details about the proposed actions to take place at the site will be a required final Phase I deliverable.

- Secured commitment letters from all team members necessary for Phase II, such as an Engineering Design contractor, a NEPA contractor, and any required technology partners or vendors.
- Updated the preliminary cost and schedule estimates for Phase II and Phase III.
- Secured any needed recipient cost share commitments for Phase II and formulated a realistic plan for securing any needed recipient cost share for Phase III.
- Completed preliminary business case analysis that quantifies the projected financial parameters (e.g., operating costs, operating revenues, financing cash flows, EBITDA, tax credits/liabilities, ROI) over the project lifespan.
- Completed Project Management Plan (PMP) (Phase II and III), an updated Risk Management Plan, Risk Register (Phase II and III), and Safety Plan.

If the applicant has already conducted or is currently conducting activities meeting the above description of Phase I under a different award or at private expense, the status of such activities should be clearly described in the Technical Volume, and only complementary (but not redundant) additional activities should be proposed. Applicants who are conducting or have already conducted most of the required Phase I activities under a different award but still want to be in consideration for Phase II awards should propose a limited scope and budget for Phase I covering only those additional activities that are necessary to meet Phase II application requirements. Updates to existing work (such as improving the cost estimate and schedule for future phases) are allowable activities in Phase I as long as they are not identical to tasks that are already complete or will be completed as part of an existing award.

C. Expected Performance Goals

Overarching performance goals for all three topic areas target achievement of the NOFO Program Objectives executed through a structured, well-informed stage-gate approach.

The key performance goal for Phase I awards is completion of sufficient front-end project development activities that support the technical and economic feasibility that awarded projects can achieve the Program goals and objectives of the relevant topic area.

The key performance goal for projects that emerge from the downselect process (i.e., projects that proceed to Phase II) is successful testing and validation of the technologies of interest.

Specific technical performance requirements are described in NOFO Section III.E (Topic Areas) and application requirements are articulated in NOFO Section IV.A.3 (Application Technical Volume Specific Requirements).

D. Topic Areas

Topic Area 1 - Development and Implementation of Advanced Wastewater Management Systems

Coal-fired power plants (CFPPs) are significant water users, requiring large volumes for cooling towers, quenching bottom ash, and flue-gas scrubbing. Consequently, they generate various wastewater streams that can contain heavy metals such as arsenic, lead, mercury, and selenium, as well as bromide, chlorides, and nitrates. Costs for treating these wastewater streams can represent a significant portion of CFPPs' overall operating budget, impacting the competitiveness of coal-fired generation.

Coal-fired power plants are confronted with the dual imperative of reducing wastewater discharge containing heavy metals and other pollutants, while simultaneously striving to extend their operational service life and reduce operational costs. Current wastewater management solutions often present formidable capital expenditures (CAPEX) and operating expenditures (OPEX), limited adaptability to varied influent conditions, and underdeveloped pathways for commercial byproduct recovery, thereby impeding their widespread adoption and the long-term economic sustainability of these power generation assets. Meeting these stringent requirements cost-effectively while maintaining operational viability and extending the service life of coal power plants is a significant challenge.

The objective of TA-1 is to validate transformational, cost-effective wastewater management systems that enhance water recovery from wastewater streams at CFPPs, reduce operational costs, and/or enhance commercial byproduct recovery. System attributes of interest include energy efficiency optimization and capital cost reduction with emphasis on prioritizing recovery of high-quality byproducts.

Wastewater streams of interest include, but are not limited to, flue gas desulfurization (FGD) wastewater, bottom ash (BA) transport water, and combustion residual leachate. Wastewater management systems anticipated to be proposed include, but are not limited to, chemical precipitation, membrane filtration, biological treatment, spray drying, thermal evaporation, encapsulation, and/or other emerging technologies with a minimum validated TRL 7.

The topic area will fund the development, engineering, implementation (i.e., construction, and operational validation/testing) of transformational wastewater management systems at existing coal plants. Funding is intended to support engineering, detailed design, installation and testing of innovative transformational wastewater management technologies integrated with existing plant infrastructure. The effort will also include a CCUS system conceptual design that will reduce CO2 emissions and provide opportunities for EOR/EGR when using either coal or natural gas fuels.

Technology implementation should be completed on a minimum 50% slipstream of an actual wastewater stream at existing coal electric generation facility for at least six months of continuous operation. Awarded projects will be required to collect sufficiently detailed cost and performance data to support the scalability and economic viability of the technology of interest.

Topic Area 2 – Engineering and Implementation of Dual Firing Retrofits:

Dual-firing allows power plants to burn both coal and natural gas individually and interchangeably, providing significant operational flexibility. This approach is gaining traction due to rising coal-firing costs and a market shift towards natural gas, driven by lower prices. Dual-firing helps coal-fired utilities adapt to changing market and regulatory conditions, ensuring their viability and competitiveness.

Retrofitting offers numerous benefits. It provides operational flexibility, allowing plants to respond to fuel cost fluctuations and market demands, managing expenses more efficiently. A key advantage is leveraging existing infrastructure, as grid interconnections are already established, bypassing costly new developments. This enables utilities to continue utilizing significant capital investments in existing power plants.

The primary goal of a dual-fuel retrofit is to assess the economic and technical feasibility of integrating natural gas into existing coal-fired boilers. This involves developing a transformational systems that can automatically switch between fuels without compromising critical operational parameters. The retrofit aims to maintain the plant's Maximum Continuous Rating (MCR) for full power output and optimal heat rate on either fuel, ensure continuous compliance with emissions regulations, and protect component life.

The effort will also include a CCUS system conceptual design that will reduce CO_2 emissions and provide opportunities for EOR/EGR when using either coal or natural gas fuels. Ultimately, the retrofit must be economically sound, offering a favorable return on investment and improving generation economics and equipment reliability.

However, dual-firing retrofits present significant challenges due to the distinct characteristics of coal and natural gas regarding flame, heat absorption, emissions, and fouling. Accommodating these differences often requires major mechanical modifications to the boiler, including adjustments to heat transfer surfaces, burners and windboxes, and potential material upgrades.

A sophisticated control system is also essential for seamless fuel management. Therefore, a comprehensive assessment must consider equipment modifications, performance impacts, fuel supply logistics, and financial risks.

This topic area aims to enable coal plants to seamlessly switch between coal and natural gas, achieving full steam capacity and emissions compliance (e.g., NOx < 0.2 lb/mmBtu, CO < 100 ppm), while optimizing combustion efficiency and economic flexibility to extend plant lifespans. Modifications must meet all relevant ASME Boiler Code and NFPA 85 Boiler and Combustion Systems Hazards Code requirements.

Funding will support the engineering, implementation, and testing of dual-fuel firing retrofits for existing coal boilers. This includes developing burner/overfire air (OFA) systems, heat transfer surface modifications, potential emissions controls modifications, and automated burner management controls for safe and reliable fuel switching. Successful applications will demonstrate the ability to switch from 100% coal to 100% natural gas offline and under automatic control, achieving 100% MCR with full emissions compliance using either fuel.

Activities include engineering studies for infrastructure adaptation and prototype testing to optimize combustion and validate performance. Funding also supports training and system integration for automatic operation, reducing capital costs, ~~and~~ enhancing competitiveness against natural gas price volatility, and development of a CCUS conceptual design to reduce CO2 emissions and provide additional revenue opportunities via EOR/EGR. Concepts that include carbon utilization are preferred over approaches that solely implement carbon capture and storage.

Topic Area 3 – Development and Testing of Natural Gas Cofiring Systems:

Co-firing enables coal power plants to simultaneously burn coal and natural gas in their boilers, utilizing either single-fuel or dual-fuel burners. This method has become a popular retrofit for existing coal-fired facilities, allowing them to adapt to changing operational and environmental needs. Co-firing offers significant benefits for coal power plants, primarily reducing emissions of mercury, SO2, NOx, particulate matter, and CO2, proportional to natural gas heat input. This improvement stems from natural gas's lack of fuel-bound nitrogen, sulfur, and ash. Additionally, co-firing can lower operating costs by decreasing operation and maintenance expenses, and can significantly reduce auxiliary power consumption associated with coal-related equipment. It also enhances operational flexibility by improving low-load capability compared to exclusive coal firing.

Despite its advantages, co-firing presents notable challenges. The main difficulty lies in managing the distinct combustion characteristics of coal and natural gas, which differ in flame behavior, heat absorption, and emission profiles. Addressing this often requires major mechanical modifications to the boiler during retrofits, including adjustments to heat transfer surfaces, burners, windboxes, and boiler auxiliaries, along with potential material upgrades. Effective mixing of the two fuels is crucial;

inadequate mixing can lead to uneven heating, excessive ash deposition, and localized temperature imbalances, impacting combustion efficiency, increasing auxiliary power consumption, and raising furnace exit gas temperatures (FEGT). Moreover, a sophisticated control system capable of seamlessly managing varying fuel proportions and loads is essential for successful co-firing.

The objective of this program on coal/natural gas co-firing is to develop transformational boiler systems that automatically and smoothly controls any proportion of coal and natural gas co-firing. The goal is to leverage commercially ready technologies while exploring innovative approaches to reduce capital costs, improve equipment reliability, and enhance the overall efficiency of the retrofitted coal power plant.

This topic area aims to develop an optimal natural gas co-firing level and system design that maximizes gas co-firing capability without requiring major redesign of the boiler steam/superheat/reheat system. Optimal co-firing rates should reduce SOx, NOx, Hg, and CO2 emissions by 20-50% while limiting retrofit costs to approximately $50/kW, maintaining boiler efficiency and reliability, and meeting regulatory and market demands. This system must maintain operational flexibility without compromising the plant's Maximum Continuous Rating (MCR), ensuring optimal heat rate, full compliance with emissions regulations, maintaining or enhancing component life, and favorable generation economics. Funding will support advancing natural gas co-firing system components, including burner modifications for 20-50% gas input, advanced control systems for fuel balance and sequencing, system integration of auxiliary equipment, ~~and~~ validation testing to optimize emissions and minimize efficiency losses, and a CCUS conceptual design to reduce CO2 emissions and provide additional revenue opportunities via EOR/EGR. Concepts that include carbon utilization are preferred over approaches that solely implement carbon capture and storage.

Recipients must collect and report detailed cost and performance data to quantify CO2 abatement costs ($25-60/ton), parasitic load reductions that mitigate efficiency impact, and maintenance savings that ensure cost-effective compliance and sustainability.

E. Applications Specifically Not of Interest

The following types of applications will be deemed non-responsive 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).
- Applications proposing host sites other than steam electric generating units capable of being fired with coal on a continuous basis during the implementation/validation phase.
- Applications that propose a host site that is not located in the United States.
- Applications designed for basic research or bench-scale testing.
- Applications that do not plan for development of a CCUS conceptual design.

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) such as downselects, continuations, and/or decision point criteria.
D. DOE participates in major project decision-making processes.

G. Statutory Authority

The programmatic authorizing statute is Energy Policy Act of 2005, 42 U.S.C. § 16291, 16292 (Public Law 109-58), as amended, and the DOE Organization Act, 42 U.S.C. § 7101., et seq. (Public Law 95-91), as amended.

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. Use and Disclosure of Application Information

Applicants should not include trade secrets or business-sensitive, proprietary, or otherwise confidential information in their application unless such information is necessary to convey an understanding of the proposed project or to comply with a requirement in the NOFO. Applicants are advised not to include any critically sensitive proprietary detail.

If an application includes trade secrets or business-sensitive, proprietary, or otherwise confidential information, it is furnished to the federal government in confidence with the understanding that the information shall be used or disclosed only for evaluation purposes. For example, DOE may disclose such information to determine whether to select the project for funding under this NOFO or other government programs, or as otherwise authorized by law. This restriction does not limit the federal government's right to use the information if it is obtained from another source.

Applications and other submissions containing trade secrets or business-sensitive, proprietary, or otherwise confidential information ("Proprietary Information") must be marked as described below. Failure to comply with these marking requirements may result in the disclosure of the unmarked information under the Freedom of Information Act or otherwise. **The Federal Government is not liable for the disclosure or use of unmarked information and may use or disclose such information for any purpose**~~. as authorized by law.~~

Notice of Restriction on Disclosure and Use of Information:
Pages of this document may contain trade secrets or business-sensitive, proprietary, or otherwise confidential information that is exempt from public disclosure. Such information shall be used or disclosed only for evaluation purposes with the restriction that the information be retained in confidence and not be further disclosed, or in accordance with a financial assistance agreement between the submitter and the government. The government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source. [End of Notice]

In addition, (1) the header and footer of every page that contains trade secrets or business-sensitive, proprietary, or otherwise confidential information must be marked as follows: "CONTAINS TRADE SECRETS, BUSINESS-SENSITIVE, PROPRIETARY, OR OTHERWISE CONFIDENTIAL INFORMATION EXEMPT FROM PUBLIC DISCLOSURE," and (2) every line or paragraph containing such information must be clearly marked with double brackets or highlighting.

Use of Application Information with Artificial Intelligence Technology
Notwithstanding the above, DOE may use, review and evaluate application information, including Proprietary Information, using artificial intelligence ("AI") technology, including for training and developing AI tools. By submitting an application, the Applicant is providing express consent to DOE's use of application information with AI tools. DOE is not liable for the use and disclosure of unmarked application information and may use or disclose such information for any purpose.

All application information is subject to public release under FOIA except information that qualifies under a FOIA exemption. One of the exemptions is trade secrets or commercial or financial information that is confidential or privileged. The above markings are essential to assist DOE in identifying such information that is exempt from public disclosure. However, the existence of the above or other protective markings is not dispositive on whether information is exempt under FOIA, only DOE's designated FOIA Officer may determine if the information qualifies for a FOIA exemption. See 10 C.F.R. Part 1004 for more information on how DOE processes FOIA requests.

Notwithstanding the above, for compliance with IMPLEMENTATION OF PRESIDENTIAL MEMORANDUM SIMPLIFYING THE FUNDING OF ENERGY INFRASTRUCTURE AND CRITICAL MINERAL AND MATERIAL PROJECTS, the Department of Energy may share and use within the Government any application information provided by or on behalf of the applicant. Accordingly, in accordance with applicable law and notwithstanding any other provisions herein, by submitting an application or agreeing to a financial assistance arrangement with the Department of Energy under this NOFO, the applicant is providing consent for any properly marked trade secret, confidential, proprietary, privileged or otherwise sensitive application information provided by or on behalf of the applicant to be disclosed to the Executive Office of the President and relevant Agencies offering loans, grants, equity, guarantees or other federal funding, for the purposes of the Presidential Memorandum on Simplifying the Funding of Energy Infrastructure and Critical Mineral and Material Projects.

B. Summary

The application process includes a single submission phase: application

Application Submission Phase	Eligibility for Submission
Application	Must be submitted by the specified due date and time to be eligible for comprehensive merit review.

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.

Often, these individuals have doctoral or other professional degrees, although individuals at the master's or Ph.D-candidate level may be considered covered individuals if their involvement meets the definition. Consultants, graduate students, and those with a postdoctoral role also may be considered covered individuals if they meet this definition.

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.

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.

If selected, throughout the life of the award, the recipient has an ongoing responsibility to submit: 1) current and pending support disclosure statements and resumes/biosketches for any new covered individuals, and 2) updated disclosures if there are changes to the current and pending support or resume/biosketch previously submitted to DOE.

2. Summary of Application Requirements

The Technical Volume should be inclusive of all three (3) phases (*See Section IV.C.3. below for general details as well as specific requirements to be addressed in the Technical Volume*). The remaining application requirements (*inclusive of the Statement of Project Objectives*) shall reflect Phase I, only.

Component	File Format	Page Limit	File Name
Application for Federal Assistance (SF-424)	PDF	n/a	ControlNumber_LeadOrganization_424
Technical Volume	PDF	25 pages	ControlNumber_LeadOrganization_Technical_Volume
Letters of Commitment	PDF	1 page each	ControlNumber_LeadOrganization_LOCs
Impacted Indian Tribes Documentation	PDF	n/a	ControlNumber_LeadOrganization_Impacted Tribes
Statement of Project Objectives	MS Word	10 pages	ControlNumber_LeadOrganization_SOPO
Project Management Plan	PDF	10 pages	ControlNumber_LeadOrganization_PMP
Budget Information Non-Construction Programs (SF-424A)	PDF	n/a	ControlNumber_LeadOrganization_SF-424A

Budget Justification Workbook	MS Excel	n/a	ControlNumber_LeadOrganization_ Budget_Justification
Subrecipient Budget Justification	MS Excel	n/a	ControlNumber_LeadOrganization_ Subrecipient_Budget_Justification
Work Proposal for FFRDC, (see DOE O 412.1A)	PDF	n/a	ControlNumber_LeadOrganization_ WP
Authorization for Non-DOE or DOE FFRDCs	PDF	n/a	ControlNumber_LeadOrganization_ FFRDC_Auth
Waiver for Foreign Entity Participation	PDF	n/a	ControlNumber_LeadOrganization_ FEW
Performance of Work in the United States (Foreign Work Waiver)	PDF	n/a	ControlNumber_LeadOrganization_ FWW
Resumes for Research and Development (R&D) NOFOs	PDF	3 pages each	ControlNumber_LeadOrganization_ Resumes
Current and Pending Support (for each covered individual)	PDF	n/a	ControlNumber_LeadOrganization_ CPS
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_ControlNumber_ LeadOrganization_TFC
Potentially Duplicative Funding Notice	PDF	n/a	ControlNumber_LeadOrganization_ PDFN
Location(s) of Work	Excel	n/a	ControlNumber_LeadOrganization_ LOW
Environmental Questionnaire	PDF	n/a	ControlNumber_LeadOrganization_ ENV
Disclosure of Lobbying Activities, if applicable (SF-LLL)	PDF	n/a	ControlNumber_LeadOrganization_ SF-LLL
Certification Regarding Lobbying (OMB 4040-0013)	PDF	n/a	ControlNumber_LeadOrganization_ Cert_Lobbying
Summary for Public Release	PDF	1	ControlNumber_LeadOrganization_ Summary
Summary Slide	MS Power Point	1	ControlNumber_LeadOrganization_ Slide

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 25 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.

While only detailed Phase I applications are being solicited at this time, information relating to preliminary plans to carry out Phases II and III will be required to assess the potential viability of the overall project.

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

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 for all three (3) phases.

Build America Buy America (BABA) Requirements for Infrastructure Projects: Within the first two pages of the SOPO, include a short statement on whether the project will involve the construction, alteration, maintenance, and/or repair of public infrastructure in the United States. See Build America, Buy America | Department of Energy and 2CFR 184 for applicable definitions and other information regarding Infrastructure Projects and the Buy America Preference.

Technical Review Criteria Discussion

The section should be formatted to address each of the technical 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 technical review criteria. DOE will evaluate and consider only those applications that address separately each of the technical review criterion and sub-criterion.

Statement of Project Objectives
The Technical Volume 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 the Phase I period of project performance, only. It is therefore required that it shall not contain proprietary or confidential business information. A Statement of Project Objectives template is provided on eXCHANGE.

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 are 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.

Technical Volume Specific Requirements

Phase I Application Specific Requirements:

Specific requirements (to be included in the Phase I application technical volume) for the merit review of applications include:

- **Project objectives and Relevance:** Supporting evidence that the proposed technology should be considered as an approach to provide a rapid and cost-effective path to restoring stability while supporting the nation's industrial and energy security priorities.
- **Host site**: Description of the host site. Discussion of the requirements for a host site for the implementation phase (i.e., Phase III), including the appropriateness of any proposed sites and any expressed interest on the part of the potential host site owners/operators.
- **Proposed technology:** Description of proposed technology and its integration with the host plant. This may include: (i) preliminary process flow diagrams (PFD), (ii) summary of site selection and host plant capabilities, (iii) mass and energy balances, (iv) steam and power requirements, and (v) plan for electrical, water, and waste management.
- **Technology prior performance:** Development history and readiness for demonstration of the proposed technology, including demonstrated technical success at meeting relevant performance metrics at pre-commercial scales.
- **Readiness of technology for commercial implementation:** Supporting evidence that the proposed technology has completed the necessary pre-commercial testing and validation such that the next appropriate step is detailed design, implementation, and testing at commercial scale.
- **Environmental Considerations**: Discussion of preliminary compliance planning to be executed in Phases II and III, and the effect of the proposed technology on host site air emission, and water and solid wastes.
- **Cost Estimates:** Preliminary cost and schedule estimate (with clearly outlined assumptions) for *all phases* inclusive of the conceptual design, detailed design, engineering, implementation, and operation of the facility.
- **Market Competitiveness:** Discussion of the financial and market viability of the proposed approach including preliminary business case analysis to demonstrate project long-term viability, including potential revenue from capacity, energy, or ancillary services.
- **Phase 1 Description:** Plans for achieving technical readiness for Phase II by the end of Phase I, including plans for: host site selection; update of preliminary cost estimate and schedule for design, construction, and operation; EPC contractor selection; and completing an EIV and addressing any other NEPA and regulatory/permitting issues.
- **Applicant/Team Capabilities**: Discussion of the current status of, and future plans for team formation, such that the team will have the necessary skills and resources to complete a final engineering and detailed design activities and the NEPA process in Phase II, and demonstration and validation in Phase III. This discussion should include plans to obtain any necessary recipient cost share for Phases II and III.

Note: If an applicant has already conducted or is currently conducting activities meeting the Section III.B description of Phase I under a different award or at private expense, the status of such activities should be clearly described in the Technical Volume, and only complementary (but not redundant) additional activities should be proposed. Applicants who are conducting or have already conducted most of the

required Phase I activities under a different award but still want to be in consideration for Phase II awards should propose a limited scope and budget for Phase I covering only those additional activities that are necessary to meet Phase II application requirements. Updates to existing work (such as improving the cost estimate and schedule for future phases) are allowable activities in Phase I as long as they are not identical to tasks that are already complete or will be completed as part of an existing award.

Phase II
The objective of Phase II will be to enable recipients to be ready to begin implementation and demonstration immediately in Phase III. Phase II activities will include Front End Engineering Design (FEED), completion of the NEPA process, and securing of any required recipient cost share for Phase III.

Phase II applications are anticipated to contain the following sections:

- Phase I Topical Report detailing the results of Phase I
- Phase II and III Budget Justification
- Phase II and III Environmental Questionnaire
- Phase II and III Technical Volume (including updated Phase II and III Statement of Project Objectives (SOPO)
- Phase II and III Project Management Plan

The comprehensive list of Phase II application requirements, including Technical Review Criteria that will be used to evaluate the Phase II application, will be detailed in Phase I awards during Phase I negotiations.

Phase III
The objective of Phase III will be to complete implementation, demonstration, and validation of the proposed commercial scale technology. The go/no-go decision point criteria to authorize Phase III activity will include, but is not necessarily limited to the following:

- Delivery of Front-End Engineering Design;
- Commitment from an EPC;
- Firm commitment to meet the 50% cost share requirement for Phase III;
- Initiation of permitting required for Phase III implementation and demonstration; and
- Delivery of test plan for demonstration and validation of the proposed technology.

The comprehensive list of Phase III go/no-go requirements will be detailed in Phase II awards during Phase II negotiations.

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 Technical Volume section. This section must include only bibliographic citations.

4. Resumes for Research and Development (R&D)

A resume provides information reviewers can use to evaluate an individual's skills, experience, and potential for leadership within the scientific community. Applicants must submit a resume or biographical sketch (see description below the table) for each Principal Investigator or Lead Project Manager and all covered individuals as defined in the NOFO Part 1, Application Content and Form—Application Content Requirements, Covered Individual Definition, Designation and Responsibility.

Applicants must screen resumes to ensure that they do not contain Personally Identifiable Information (PII) such as personal addresses, personal landline/cell phone numbers, and personal emails. Resumes must include the following information, at a minimum:

Resume Requirements (Research & Development Activities)	
Contact Information	Phone, email, and address
Education & Training	Provide name of institution, major/area, degree, and year for undergraduate, graduate, and postdoctoral training
Research & Professional Experience	Beginning with the current position, list professional/academic positions in chronological order with a brief description. List all current academic, professional, or institutional appointments, foreign or domestic, at the applicant institution or elsewhere, whether remuneration is received, and, whether full-time, part-time, or voluntary
Awards & Honors	List any notable awards and honors received
Publications	List of up to 10 publications most closely related to the proposed project. For each publication, identify the names of all authors (in the same sequence in which they appear in the publication), the article title, book or journal title, volume number, page numbers, year of publication, and website address if available electronically. Patents, copyrights, and software systems developed may be provided in addition to or substituted for publications. An abbreviated style such as the Physical Review Letters (PRL) convention for citations (list only the first author) may be used for publications with more than 10 authors
Synergistic Activities	List up to five professional and scholarly activities related to the proposed effort

Additional Criteria	There should be no lapses in time over the past 10 years or since age 18, whichever period is shorter.

As an alternative to a resume, it is acceptable to use the biographical sketch format approved by the National Science Foundation (NSF). The biographical sketch format may be generated by the Science Experts Network Curriculum Vita (SciENcv), a cooperative venture maintained at SciENcv: Science Experts Network Curriculum Vitae (nih.gov) also available at Common Form for Biographical Sketch (nsf.gov). The use of a format required by another agency is intended to reduce the administrative burden to researchers by promoting the use of common formats.

5. Current and Pending (Other) Support

Current and pending support is intended to allow the identification of potential duplication, overcommitment, potential conflicts of interest or commitment, and all other sources of support. As part of the application, the Principal Investigator or Lead Project Manager and all covered individuals as defined in the NOFO Part 1, *Application Content Requirements--Covered Individual Definition, Designation, and Responsibility* at the applicant and subrecipient level must comply with current and pending support requirements. Consistent with the chart below, the current and pending support disclosures and biosketch/resumes must together include a list of all sponsored activities, awards, and appointments, whether paid or unpaid; provided as a gift with terms or conditions or provided as a gift without terms or conditions; full-time, part-time, or voluntary; faculty, visiting, adjunct, or honorary; cash or in-kind; foreign or domestic; governmental or private-sector; directly supporting the individual's research or indirectly supporting the individual by supporting students, research staff, space, equipment, or other research expenses. All connections with malign foreign talent recruitment programs must be identified in current and pending support.

Information Required for Each Activity	
Sponsor of the Activity	The sponsor of the activity or the source of funding. Identify the entity for each proposal and/or active project that provides the support. Include all Federal, State, Tribal, territorial, local, foreign, public or private foundations, non-profit organizations, industrial or other commercial organizations, or internal funds allocated toward specific projects.
Award Number	The federal award number or any other identifying number.
Title	The title of the award or activity. If the title of the award or activity is not descriptive, add a brief description of the research being performed that would identify any overlaps or synergies with the proposed research
Total Cost or Value	The total cost or value of the award or activity, including direct and indirect costs and cost share. For pending proposals, provide the total amount of requested funding. For in-kind contributions, enter the US dollar value of the in-kind contribution with an estimated value of $5000 or more. If the dollar value is not readily ascertainable, a reasonable estimate should be provided. If the support is in a foreign country's currency, convert to US dollars at time of submission rounded to the nearest dollar.

Primary Place of Performance	Identify the primary location where the proposal and/or active project is being executed. Enter the City, State/Province, and Country where the organization is located. If the State/Province is not applicable, state N/A.
Project Period	The "Start Date" through "End Date".
Person-months	The person-months of effort per year dedicated to the award or activity. Enter how much time the individual anticipates is necessary to complete the scope of work on the proposal and/or active project. Enter the number of person-months (even if unsalaried) for the current budget period and enter the proposed person-months for each subsequent budget period. If the time commitment is not readily ascertainable, a reasonable estimate should be provided.
Overall Objectives	Provide a brief statement of the overall objectives of the proposal/active project.
Statement of Potential Overlap	Enter a description of the potential overlap with any pending proposal or active foreign or domestic project and this proposal in terms of scope, budget, or person-months planned or devoted to the project by the individual. If there is no potential overlap, state “none”.
Digital Persistent Identifier (e.g., ORCID iD)	For R&D NOFOs only, providing an ORCID iD is required.
Certification Statement	All covered individuals must provide a separate disclosure statement listing the required information above regarding current and pending support. Each individual must sign and date their respective certification statement: *I, [Full Name and Title], understand that I have been designated as a covered individual by the Federal funding agency.* *I certify to the best of my knowledge and belief that the information contained in this Current and Pending Support Disclosure Statement is true, complete, and accurate. I understand that any false, fictitious, or fraudulent information, misrepresentations, half-truths, or omissions of any material fact, may subject me to criminal, civil, or administrative penalties for fraud, false statements, false claims, or otherwise. (18 U.S.C. §§ 1001 and 287, and 31 U.S.C. §§ 3729-3733 and 3801-3812). I further understand and agree that (1) the statements and representations made herein are material to DOE’s funding decision, and (2) I have a responsibility to update the disclosures during the period of performance of the award should circumstances change which impact the responses provided above.*

	I also certify that, at the time of submission, I am not a party in a malign foreign talent recruitment program*. I further understand should I take action to involve myself with a Malign Foreign Talent Recruitment Program during the period of performance of the award, I must notify the recipient's Authorized Agent immediately, but no later than five business days of taking such action and immediately recuse myself from all DOE awards.* **The following certification is required for R&D projects:** *I further certify that within the past 12 months I have completed research security training meeting the requirements in SEC. 10634(b) of 42 USC 19234.*
Foreign Government Sponsorship	Details of any obligations, contractual or otherwise, to any program, entity, or organization sponsored by a foreign government must be provided on request to either the applicant institution or DOE. Supporting documents of any identified source of support must be provided to DOE on request, including certified translations of any document.

The information may be provided in the Common Form for Current and Pending (Other) Support. Regardless of the format used, the individual must include a signature, date, and a certification statement using the language included in the table above.

Current and Pending Support Disclosures must be submitted for all covered individuals, include the exact certification statement provided above, and must be signed and dated to be considered.

Definitions:

Current and pending support –

A) All resources made available, or expected to be made available, to an individual in support of the individual's RD&D efforts, regardless of
   i. whether the source is foreign or domestic;
   ii. whether the resource is made available through the entity applying for an award or directly to the individual; or
   iii. whether the resource has monetary value; and

B) includes in-kind contributions requiring a commitment of time and directly supporting the individual's RD&D efforts, such as the provision of office or laboratory space, equipment, supplies, employees, or students.

This term has the same meaning as the term "Other Support" as applied to researchers in the Presidential Memorandum on United States Government-Supported Research and Development National Security Policy-33 (NSPM-33): For researchers, Other Support includes all resources made available to a researcher in support of and/or related to all of their professional RD&D efforts, including resources provided directly to the individual or through the organization, and regardless of whether they have monetary value (e.g., even if the support received is only in-kind, such as office/laboratory

space, equipment, supplies, or employees). This includes resource and/or financial support from all foreign and domestic entities, including but not limited to gifts provided with terms or conditions, financial support for laboratory personnel, and participation of student and visiting researchers supported by other sources of funding.

Making Foreign Talent Recruitment Program as defined in P.L. 117-167, Section 10638(4):

A) any program, position, or activity that includes compensation in the form of cash, in-kind compensation, including research funding, promised future compensation, complimentary foreign travel, things of non de minimis value, honorific titles, career advancement opportunities, or other types of remuneration or consideration directly provided by a foreign country at any level (national, provincial, or local) or their designee, or an entity based in, funded by, or affiliated with a foreign country, whether or not directly sponsored by the foreign country, to the targeted individual, whether directly or indirectly stated in the arrangement, contract, or other documentation at issue, in exchange for the individual—
   i. engaging in the unauthorized transfer of intellectual property, materials, data products, or other nonpublic information owned by a United States entity or developed with a federal research and development award to the government of a foreign country or an entity based in, funded by, or affiliated with a foreign country regardless of whether that government or entity provided support for the development of the intellectual property, materials, or data products;
   ii. being required to recruit trainees or researchers to enroll in such program, position, or activity;
   iii. establishing a laboratory or company, accepting a faculty position, or undertaking any other employment or appointment in a foreign country or with an entity based in, funded by, or affiliated with a foreign country if such activities are in violation of the standard terms and conditions of a federal research and development award;
   iv. being unable to terminate the foreign talent recruitment program contract or agreement except in extraordinary circumstances;
   v. through funding or effort related to the foreign talent recruitment program, being limited in the capacity to carry out a research and development award or required to engage in work that would result in substantial overlap or duplication with a federal research and development award;
   vi. being required to apply for and successfully receive funding from the sponsoring foreign government's funding agencies with the sponsoring foreign organization as the recipient;
   vii. being required to omit acknowledgment of the recipient institution with which the individual is affiliated, or the federal research agency sponsoring the research and development award, contrary to the institutional policies or standard terms and conditions of the federal research and development award;
   viii. being required to not disclose to the federal research agency or employing institution the participation of such individual in such program, position, or activity; or
   ix. having a conflict of interest or conflict of commitment contrary to the standard terms and conditions of the federal research and development award; and

(B) a program that is sponsored by—
   i. a foreign country of concern or an entity based in a foreign country of concern, whether or not directly sponsored by the foreign country of concern;

ii. an academic institution on the list developed under section 1286(c)(8) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (10 U.S.C. 2358 note; 1 Public Law 115–232); or
iii. a foreign talent recruitment program on the list developed under section 1286(c)(9) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (10 U.S.C. 2358 note; 1 Public Law 115–232).

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**
Buy America Preference for Infrastructure Projects	NOFO Part 1	Applicable to awards made under this NOFO
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.

1. Buy America Preference for Infrastructure Projects

Awards funded through this NOFO that are for, or contain, construction, alteration, maintenance, or repair of public infrastructure in the United States undertaken by applicable recipient types, require that:

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

Please refer to the Standard Terms and Conditions and 2 CFR Part 184 to determine whether the Buy America Preference applies and if they should consider the application of the Buy America Preference in the proposed project's budget and/or schedule. (Note that the Buy America Preference does not apply to prime recipients that are for-profit entities.)

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. eXCHANGE

Register and create an account in the eXCHANGE site identified in the Key Facts section of the NOFO Part 1. This account can be used to apply to open NOFOs in eXCHANGE. To view and submit applications to open opportunities under a specific DOE office(s), you must access the applicable instance of the system. You may need to be registered in more than one instance to submit applications for opportunities managed by different DOE offices.

Each organization or business unit, whether acting as a team or a single entity, should use only one account as the contact point for each submission. Applicants must also designate backup points of contact. **This step is required to apply to this NOFO.**

3. Grants.gov Registration

You must have an active Grants.gov registration to receive automatic updates when modifications to this NOFO are posted. Doing so requires a Login.gov registration as well. Step-by step instructions for applicants at How to Apply for Grants website https://www.grants.gov/applicants/grant-applications/how-to-apply-for -grants.

B. Application Package

1. eXCHANGE

The application package requirements are outlined in the Application Content and Form section above. Several templates for application requirements are included in eXCHANGE. To access these materials, select the appropriate NOFO on the Funding Opportunity page of eXCHANGE.

Note: The maximum file size that can be uploaded to the eXCHANGE 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 eXCHANGE, constitutes the authorized representative's approval and electronic signature.

C. Submission Date and Times

All required submissions must be submitted to the eXCHANGE 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 eXCHANGE 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 applications will be deemed nonresponsive and will not be reviewed or considered:

- Project concepts or approaches identified specifically as NOT of interest (see the Applications Specifically Not of Interest section above).
- Applicant/Applications that do NOT meet the Eligibility Criteria in NOFO Parts 1 and 2.

C. Review Criteria

1. Compliance Criteria

All applicant submissions 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 eXCHANGE site indicated in the Key Facts section above including clicking the "Submit" button; and
- Comply with the submission deadline stated in Key Facts no later than 5:00 P.M. ET (see Submission Dates and Times)

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

2. Technical Review Criteria

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**
Scientific and Technical Merit	30%
Financial and Market Viability	20%
Technical Approach and Understanding	20%
Applicant/Team Capabilities and Facilities	30%

Criterion 1: Scientific and Technical Merit (30%)

1. **Project Objectives and Relevance:** Degree to which the application clearly demonstrates that the proposed technology can meet the technical requirements of the NOFO Topic Area in terms of operational capability, capital costs, operational costs, economic viability, performance, emissions, and/or byproduct recovery as compared to today's commercial technologies.

2. **Technology Prior Performance:** Degree to which the applicant demonstrates that previous technology development and previously completed design work, when supplemented by the proposed design development activities, will provide a sufficient basis to commence work on a preliminary front-end engineering design (pre-FEED).

3. **Readiness of the technology for commercial implementation:** Includes demonstrated success of the proposed technology at meeting relevant performance metrics at pre-commercial scale. Also includes the depth and quality of the applicant's understanding of the remaining challenges associated with commercial demonstration.

4. **Environmental Considerations:** Adequacy of environmental compliance planning and discussion of emissions and fuel impacts consistent with statutory authorities

Criterion 2: Financial and Market Viability (20%)

1. **Cost Share and Financing Commitment**: Availability and credibility of non-federal cost share, financing commitments, and contingency planning. Completeness of financial information and consistency with the funding requirements for this project. This includes the degree of, and strength of, the project team members' business and financial commitment to the project as well as the financial condition and capacity of proposed funding sources to provide their portion of project costs, including development costs.

2. **Cost Estimates**: Completeness of the preliminary cost estimate and validity of the assumptions made in estimating the costs for the design, engineering, implementation, and testing of the proposed system. Adequacy of economic rationale for the proposed approach versus state of the art or commercially available alternatives.

3. **Market Competitiveness**: Degree to which the project demonstrates long-term viability, including potential revenue from capacity, energy, or ancillary services (e.g., by-product revenue stream).

4. **Impact of DOE Funding**: Degree to which DOE support is necessary to advance the project and derisk private investment.

Criterion 3: Technical Approach and Understanding (20%)

1. **Project Schedule:** Adequacy and feasibility of the Applicant's approach to achieving the goal of technical readiness for Phase II by the end of Phase I. Includes: plans and schedule for host site selection; update of preliminary cost estimate and schedule for design, construction, and operation; FEED contractor selection; addressing NEPA and other regulatory/permitting issues; and the level to which Applicant has successfully completed Phase I activities prior to application submittal (if applicable).

2. **Statement of Project Objectives (SOPO):** Feasibility, appropriateness, rationale, and completeness of the proposed SOPO, such that there is a logical progression of work and a clear path forward toward meeting the NOFO goals and objectives. Quality and measurability of proposed technical and financial deliverables.

3. **Project Management Plan (PMP):** Adequacy and completeness of the PMP in establishing baselines (technical scope, budget, schedule) and in managing project performance relative to those baselines; defining the actions that will be taken when these baselines must be revised; and identification of strategies for controlling risks to successful project completion. This includes the completeness and reasonableness of the Milestone Log, Success Criteria at Decision Points, Funding and Costing Profiles, and an appropriate Resource-Loaded Schedule with respect to the SOPO, schedule, NOFO objectives, and NOFO Specific Requirements.

Criterion 4: Applicant/Team Capabilities and Facilities (30%)

1. **Team Qualifications:** Strength of the proposed project team, or the applicant's plan to form a project team, capable of executing a successful commercial demonstration, including the experience and interest level of all relevant stakeholders. Includes depth and clarity of the discussion regarding all existing obstacles (e.g., technical, financial, legal, political) to successful team formation, and evidence of interest from relevant parties including plans to obtain commitments from important stakeholders and/or other team members.

2. **Team Past Performance:** Appropriateness and extent of credentials, capabilities, and experience with respect to the work outlined in the Technical Approach to be performed by the key personnel and partnering organizations (including partners, sub-recipients, consultants, etc.).

3. **Host Site**: Evidence that the applicant will be able to select and secure access to a suitable host site for the proposed implementation. Includes the applicant's understanding of site requirements including technical, regulatory, and environmental issues, appropriateness of proposed sites, and indications of support from owners of any proposed host sites.

4. **Management Structure:** Clarity, logic, and effectiveness of the project organization, including sub-recipients, with respect to roles and responsibilities with regard to task assignments, communication, monitoring and controlling project scope, cost, schedule, and risk, and to successfully complete the project. Extent to which the roles, responsibilities and availability of each team member and key personnel have been delineated. Demonstrated project management expertise on projects of similar size, scope, and complexity.

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 will employ procurement of U.S. iron, steel, manufactured products, and construction materials;
8. The degree to which the proposed project demonstrates the President's policy priorities;
9. All else being equal, preference will be given to institutions with lower indirect cost rates; and
10. The degree to which the applicant contributes to a broad range of recipients likely to produce immediately demonstrable results and recipients with the potential for potentially longer-term breakthrough results, consistent with the objectives of the NOFO.

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; Infrastructure Investment and Jobs Act-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**
Real Property and Equipment	NOFO Part 1
Program Down-Select	NOFO Part 1
Rights in Technical Data	NOFO Part 1
Energy Data eXchange	NOFO Part 1
Invoice Review and Approval	NOFO Part 1
Cost Share Payment	NOFO Part 1
Data Management and Sharing Plan (DMSP)	NOFO Part 2

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. Program Down-Select

If applicable, each Phase I project selected under this NOFO will be subject to a competitive project review referred to as a down-select process.

Upon the completion of a defined decision point (e.g., end of a phase), DOE will conduct a competitive project review (down-selection process). Recipients will present their projects to DOE individually (not to other recipients). Subject matter experts from academia, national laboratories, and industry may be used as reviewers, subject to conflict of interest and non-disclosure considerations.

The down-select technical review criteria will be included in the Phase I awards.

Upon completion of the competitive project review (down-selection process), DOE will select which projects will receive federal funding beyond the specified decision point. Due to the availability of funding and program considerations, only a portion of the recipients may be selected to receive funding for project continuation. As a result of this down-select process, certain projects may not receive federal funding beyond the specified decision point even if the project is meeting the predefined metrics.

3. 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 (5) 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.

4. Cost Share Payment

DOE requires recipients to contribute the cost share amount incrementally over the life of the award. The terms and conditions of the award will specify the recipient's cost share interval, such as by **billing period** or on a budget period basis. The recipient's cost share for each interval must always reflect the overall cost share ratio negotiated by the parties (e.g., 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). When FFRDC funding will be provided directly to the FFRDC(s) by DOE, recipients will be required to provide project cost share at a percentage commensurate with the FFRDC costs, on a budget period basis, resulting in a higher interim invoicing cost share ratio than the total award ratio.

In limited circumstances, and where it is in the government's interest, the DOE Grants Officer may approve a request by the recipient to meet its cost share requirements on a less frequent basis than required by the terms and conditions of the award. Regardless of the interval requested, the recipient must be up to date on cost share at each interval. Such requests must be sent to the Grants Officer during award negotiations and include the following information: (1) a detailed justification for the request; (2) a proposed schedule of payments, including amounts and dates; (3) a written commitment to meet that schedule; and (4) such evidence as necessary to demonstrate that the recipient has complied with its cost share obligations to date. The Grants Officer must approve all such requests before they go into effect.

5. Invoice Review and Approval

DOE employs a risk-based approach to determine the level of supporting documentation required for approving invoice payments. Recipients may be required to provide some or all of the following items with their requests for reimbursement:

- Summary of costs by cost categories;
- Timesheets or personnel hours report;
- If applicable, proof of compliance with the Davis-Bacon Act and electronic submittals of certified payroll reports;
- Invoices/receipts for all travel, equipment, supplies, contractual, and other costs;
- UCC filing proof for equipment acquired with project funds by for-profit recipients and subrecipients;
- Explanation of cost share for invoicing period;
- Analogous information for some subrecipients; and
- Other items as required by DOE

6. Energy Data eXchange (EDX) Requirements

The DOE is required to improve access to federally funded research results, proper archiving of digital data, and expanded discovery and reuse of research datasets per DOE and Executive Orders. The Energy Data eXchange (EDX) is a data laboratory developed and maintained by NETL to find, connect, curate, use, and re-use data to advance fossil energy and environmental research and development (R&D). Data products generated under the resulting award will be required to be submitted in the EDX at https://edx.netl.doe.gov/. Data products include but are not limited to software code, tools, applications, webpages, portfolios, images, videos, and datasets.

EDX uses federation and web services to elevate visibility for publicly approved assets in the system, including connections with DOE's Office of Scientific and Technical Information (OSTI) systems, Data.gov, and Re3Data. This ensures compliance with federal requirements, while raising visibility for researcher's published data products to promote discoverability and reuse.

EDX supports a wide variety of file types and formats including: 1) data, 2) metadata, 3) software/tools, and 4) articles (provided that there is an accompanying Government use license). A partial list of file formats accepted by EDX is provided below, however, EDX is designed for flexibility and accepts all types of file formats.

- Common Data Product Submission Formats: ASC, AmiraMesh, AVI, CAD, CSV, DAT, DBF, DOC, DSV, DWG, GIF, HDF, HTML, JPEG2000, JPG, MOV, MPEG4, MSH/CAS/DAT, NetCDF, PDF, PNG, PostScript, PPT, RTF, Surface, TAB, TIFF, TIFF Stacks, TXT, XLS, SML, Xradio, ZIP, and others.
- Geographic Formats: APR, DBF, DEM, DLG, DRG, DXF, E00, ECW, GDB, GeoPDF, GeoTIFF, GML, GPX, GRID, IMG, KML, KMZ, MOB, MrSID, SHP, and others.

Information provided to EDX will be made publicly available, unless otherwise prohibited under the resulting award. Additional information on EDX is available at https://edx.netl.doe.gov/about.

When data products are submitted to EDX, the data product will need to be registered with a digital object identifier (DOI) through OSTI to ensure more visibility in other search repositories (i.e., osti.gov, data.gov, Google Scholar, etc.). The OSTI DOI can be established through an application programming interface (API) by completing just a few additional fields.

The recipient or subrecipient should coordinate with the Project Manager on an annual basis to assess if there is data that should be submitted to EDX and identify the proper file formats prior to submission. All final data products shall be submitted to EDX by the recipient prior to the completion of the project.

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 to DE-FOA-0003606@netl.doe.gov no 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 eXCHANGE site listed in the Key Facts section above. **You must first select the NOFO Number to view the questions and answers specific to this NOFO**. 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 and use of the eXCHANGE site listed in the Key Facts, should be submitted to NETL-ExchangeSupport@hq.doe.gov

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.

IX. Other Information

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

A. Acronyms

Acronym	Spelled Out	Acronym	Spelled Out
API	Application Programming Interface	**LPM**	Lead Project Manager
ARL	Adoption Readiness Level	**M&O**	Management and Operation
BABA	Build America Buy America	**NERC**	North American Electric Reliability Corporation
C2M2	DOE Cybersecurity Capability Maturity Model	**NETL**	National Energy Technology Laboratory
CFR	Code of Federal Regulations	**NIST**	National Institute of Standards and Technology
CIP	Critical Infrastructure Protection	**NOFO**	Notice of Funding Opportunity
CSF	Cybersecurity Framework	**NSF**	National Science Foundation
CRADA	Cooperative Research and Development Agreement	**NSPM**	National Security Policy Memorandum
DOE	United States Department of Energy	**OMB**	Office of Management and Budget
DOI	Digital Object Identifier	**OSHA**	The Occupational Safety and Health Administration
DMSP	Data Management and Sharing Plan	**OSTI**	DOE's Office of Scientific and Technical Information
EDX	Energy Data eXchange	**OTA**	Other Transaction Authority
FFRDC	Federally Funded Research and Development Center	**PD**	Project Director
GOGO	Government Owned and Operated	**PI**	Principal Investigator
ICS	Industrial Control Systems	**R&D**	Research and Development
IED	Intelligent Electronic Devices	**RMP**	Risk Management Plan
IEEE	Institute of Electrical and Electronics Engineers	**SAM**	System for Award Management
IIJA	Infrastructure Investment and Jobs Act	**SMART**	Specific, Measurable, Achievable, Relevant, and Timely
IPS	Integrated Project Schedule	**SOPO**	Statement of Project Objectives
IRA	Inflation Reduction Act	**SPOC**	Single Point of Contact
ISO	International Organization for Standardization	**TEA**	Techno-Economic Analysis
KPI	Key Performance Indicators	**UEI**	Unique Entity Identifier
LDES	Long-Duration Energy Storage	**WBS**	Work Breakdown Structure