Financial Assistance
Notice of Funding Opportunity
Part 1

U.S. Department of Energy (DOE)
Wind Energies Technologies Office
Bipartisan Infrastructure Law (BIL), Provision 41007(b)(2),
Wind Turbine Technology Recycling
Notice of Funding Opportunity Number: DE-FOA-0003373

Full Application due: February 11, 2025, 5:00 pm ET

Modifications

Mod. No.	Date	Description of Modification
0001	1/16/25	Added information regarding cost share of Tribes and Tribal Nations pursuant to EERE's uniform cost share reduction.

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

Modifications to this NOFO will be posted on eXCHANGE and Grants.gov. Grants.gov will automatically notify applicants when a NOFO modification is processed. Applicants must be registered to this NOFO in Grants.gov to receive email

Table of Contents

Before You Begin

Navigating the Notice of Funding Opportunity

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

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

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

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

I. Basic Information

A. Key Facts

Issuing Agency	Department of Energy, Office of Energy Efficiency and Renewable Energy, Wind Energy Technologies Office
Funding Opportunity Title	Bipartisan Infrastructure Law (BIL), Provision 41007(b)(2), Wind Turbine Technology Recycling
Announcement Type	Initial
Funding Opportunity Number	DE-FOA-0003373
Funding Instrument	Cooperative Agreements
Assistance Listing Number	81.087
Funding Opportunity Description	This program will provide funding in support of BIL section 41007 (b)2), which authorizes funds to carry out the Wind Energy Technology Recycling Research, Development, and Demonstration program defined in section 3003 (b)(4) of the Energy Act of 2020.
Program Goals & Objective(s)	The NOFO objective is to accelerate the acceptance of recycling and reuse of wind energy materials. By increasing the utilization of recycled and reused materials, carbon emissions and other negative resource impacts related to new component manufacturing can be reduced or eliminated. Furthermore, the ability to continuously reuse materials domestically can reduce the dependence of the domestic clean energy economy on internationally sourced materials, including critical materials.

Topic Areas	• Topic Area 1: Enabling Sustainable Wind Turbine Components
	  ○ This topic seeks to accelerate development and adoption of novel materials and component designs that will increase the sustainability and recyclability of wind energy systems
	• Topic Area 2: Enabling Wind Turbine Material Recycling and Reuse Processes
	  ○ This topic seeks to accelerate development and adoption of novel recycling and reuse processes for decommissioned wind components and manufacturing waste
	• Topic Area 3: Recycled and Recyclable Material Qualification

KEY DATES

Notice of Funding Opportunity Issue Date: December 11, 2024

Application Deadline: February 11, 2025

Anticipated Selection Notification Date: May 2025

Anticipated Award Date: Q3 2025

Estimated Period of Performance: 2026-2030

	○ This topic seeks to develop methodologies for characterizing the performance of recycled and recyclable materials which can then be adopted by industry to facilitate use of recycled materials in secondary markets
Eligible Applicants	• Institutions of higher education; • For-profit entities; • Nonprofit entities; • 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
eXCHANGE URL and Helpdesk	*https://eere-exchange.energy.gov* *EERE-eXCHANGESupport@hq.doe.gov*

1. Funding Details

Multiple Topic Areas
Approximate total available funding including all topic areas: $20M over 4 years

Topic Area 1: Enabling Sustainable Wind Turbine Components
Approximate total available funding: $11M
Approximate number of awards: 1-3
Approximate dollar amount of individual awards: $3M - $8M
Minimum cost share required: 20% of the total project costs – Cost share waiver in place, see Cost Share Requirements
Approximate award project period: 24-48 months
Anticipated number of budget periods: 2-3

Topic Area 2: Enabling Wind Turbine Material Recycling and Reuse Processes
Approximate total available funding: $6M
Approximate number of awards: 1-3
Approximate dollar amount of individual awards: $2M - $6M
Minimum cost share required: 20% of the total project costs - Cost share waiver in place, see Cost Share Requirements
Approximate award project period: 24-48 months
Anticipated number of budget periods: 2-3

Topic Area 3: Recycled and Recyclable Material Qualification
Approximate total available funding: $3M
Approximate number of awards: 1
Approximate dollar amount of individual awards: $3M
Minimum cost share required: 20% of the total project costs – Cost share waiver in place, see Cost Share Requirements
Approximate award project period: 36 months

Anticipated number of budget periods: 2-3

2. Period of Performance

DOE anticipates making awards, comprised of multiple budget periods. If applicable, project continuation will be contingent upon DOE's Go/No-Go decision. For a complete list and more information on the Go/No-Go review, see the NOFO Part 2, *Award Administration Information*.

B. Executive Summary

The Wind Turbine Technology Recycling NOFO is a $20M program intended to address various barriers to widespread adoption of recycling for two major materials found in wind energy systems, fiber reinforced composites and rare earth elements. The overall goals are as follows:

- Accelerate development of designs that are more easily recyclable and reusable
- Accelerate development of end-of-life processing technologies to cost effectively, sustainably, and efficiently recycle and recover materials from wind turbines, including manufacturing waste
- Address technological and supply chain challenges limiting recycling of fiber reinforced composites and rare earth element magnets in wind turbines

This NOFO is divided into three Topic Areas largely corresponding to the three goals listed above. Topic 1, titled Enabling Sustainable Wind Turbine Components, seeks to support projects that will de-risk sustainable and recyclable wind turbine component designs and materials and accelerate broad commercial acceptance of these designs. Topic 2, titled Enabling Wind Turbine Material Recycling and Reuse Processes, seeks to support the development of material processing technologies and techniques that can be applied at commercial scale to enhance the recycling and recovery of wind turbine materials. Topic 3, titled Recycled and Recyclable Material Qualification, seeks to develop a research collaborative to provide a key mechanism to qualify and certify recycled materials that are relevant for wind energy technologies.

Topics 1 and 2 are focused on technology development and should move innovative products and processes closer to commercial deployment. It is expected that projects proposed under these topics will be led by a private entity or group of entities capable of commercializing the subject technology. Project teams may also include universities, national labs, and other non-profit organizations with unique expertise and capabilities, as well as state and local government entities and Indian Tribes.

Topic 3 is focused on developing standard methodologies for qualifying and certifying recycled materials and it is expected that proposed projects would be led by a partnership of non-profit entities with relevant expertise and capabilities and supported by for-profit groups interested in participating.

This program should result in various technologies that can be scaled into a cost-effective and sustainable recycling industry for current and future wind materials that have been difficult to recycle. This industry should be supported by the standard certification processes developed by this program.

C. Agency Contact Information

Wind Energy Technologies Office, Office of Energy Efficiency and Renewable Energy
U.S. Department of Energy
1000 Independence Ave SW
Washington, D.C. 20585

For questions relating to this specific NOFO, please send emails to WETOFOA@ee.doe.gov.

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

II. Eligibility

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

A. Eligible Applicants

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

1. Domestic Entities

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

- Institutions of higher education;
- For-profit organization;
- Nonprofit organization;
- State and local governmental entities; and
- Indian Tribes, as defined in section 4 of the Indian Self-Determination and Education Assistance Act, 25 U.S.C. § 5304[1]

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

2. Foreign Entity Participation

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

A foreign entity may submit an application to this NOFO, but the application must be accompanied by an explicit written waiver request. Likewise, if the applicant seeks to include a foreign entity as a

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

subrecipient, the applicant must submit a separate explicit written waiver request in the application for each proposed foreign subrecipient. Please see NOFO Part 2, *Application Content Requirements* for the requirements for submission of a foreign entity waiver request. The applicant does not have the right to appeal DOE's decision concerning a waiver request.

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

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

Foreign Entity Participation
A foreign entity is eligible to apply for funding as a recipient if it designates in the application a subsidiary or affiliate incorporated (or otherwise formed) under the laws of a state or territory of the United States to be the recipient. The application must state the nature of the corporate relationship between the foreign entity and domestic subsidiary or affiliate.

Foreign entities may request a waiver of the requirement to designate a subsidiary in the United States as the recipient in the application (i.e., a foreign entity may request that it be the recipient). To do so, the applicant must submit an explicit written waiver request in the application.

NOFO Part 2, *Application Content Requirements* lists the information that must be included in a request to waive this requirement. The applicant does not have the right to appeal DOE's decision concerning a waiver request.

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

- DOE FFRDCs[2] are eligible to apply for funding as a recipient or subrecipient.
- Non-DOE FFRDCs are eligible to participate as a subrecipient but are not eligible to apply as a recipient.
- Federal agencies and instrumentalities (other than DOE) are eligible to participate as a subrecipient but are typically not eligible to apply as a recipient.

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.

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

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

- 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 only one application for each topic area of this NOFO. If an entity submits more than one application the DOE will only review the last submission. Any other submissions received listing the same entity as the applicant for the same topic area will not be eligible for further consideration. This limitation does not prohibit an applicant from collaborating on other applications (e.g., as a potential subrecipient or partner) so long as the entity is only listed as the applicant on one application for each topic area of this NOFO.

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[3] for research and development projects.[4] Cost sharing is not required for domestic institutions of higher education, domestic nonprofit organizations, national laboratories, FFRDCs, U.S. state and local government entities, and Tribal government entities under Topic Area 3 only as described below.

Topic Area Number	Topic Area Title	Cost Share Requirement
1	Enabling Sustainable Wind Turbine Components	20% *10% for Tribes and Tribal Nations

[3] Total project costs are the sum of the government share, including FFRDC costs if applicable, and the recipient share of project costs.
[4] Energy Policy Act of 2005, Pub. L. 109-58, sec. 988. Also see 2 CFR 200.306 and 2 CFR 910.130 for additional cost sharing requirements.

2	Enabling Wind Turbine Material Recycling and Reuse Processes	20% *10% for Tribes and Tribal Nations
3	Recycled and Recyclable Material Qualification	0% for domestic institutions of higher education, domestic nonprofit organizations, national laboratories, FFRDCs, U.S. state and local government entities, and Tribal government entities.** 20% for all other entities.

*Tribes and Tribal Nation applicants are required to provide only a minimum 10% cost share pursuant to EERE's uniform cost share reduction applicable to NOFOs issued after October 3, 2024, entitled Determination to Reduce Non-Federal Cost Share Requirements for Tribes and Tribal Nations Applying for Funding from the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy.

**A cost share waiver is in place for Topic Area 3 applicants that are domestic institutions of higher education, domestic nonprofit organizations, national laboratories, FFRDCs, U.S. state and local government entities, and Tribal government entities. This waiver is granted per 2 CFR § 910.130(b)(2) upon the determination that it is necessary and appropriate to reduce or eliminate the cost sharing requirement for a research and development activity for such entities. The cost share must come from non-federal sources unless otherwise allowed by law.

Applications that do not meet the minimum required cost share will be deemed ineligible during the initial compliance review and will not be further reviewed. The cost share must come from non-federal sources unless otherwise allowed by law.

The cost share percentage is calculated by dividing the cost share by the total allowable project costs for the award where the total allowable project costs include government share (including FFRDC costs if applicable) and cost share. To help applicants calculate proper cost share amounts, DOE has included a cost share information sheet and sample cost share calculation in the NOFO Part 2, *Eligibility—Cost Sharing, Cost Share Calculation Examples*.

D. FFRDC Eligibility Criteria

1. DOE FFRDCs as the Applicant

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

The following wording is acceptable for the authorization:

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

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

2. DOE and Non-DOE FFRDCs as a Subrecipient

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

Authorization for non-DOE FFRDCs

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

Authorization for DOE FFRDCs

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

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

Funding, Cost Share, and Subaward with FFRDCs

The value of and funding for the FFRDC portion of the work will not normally be included in the award. DOE FFRDCs participating as a subrecipient on a project will be funded directly through the DOE Work Authorization process in accordance with DOE O 412.1A. Non-DOE FFRDCs participating as a subrecipient will be funded through an interagency agreement with the sponsoring agency.

Although the FFRDC portion of the work is excluded from the award, 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.

All DOE FFRDCs are required to enter into a Cooperative Research and Development Agreement[5] (CRADA) or, if the role of the DOE FFRDC is limited to technical assistance and intellectual property is not anticipated to be generated from the DOE FFRDC's work, a Technical Assistance Agreement (TAA), with at least the recipient. A fully executed CRADA or TAA must be in place or be compliant with a Master Scope of Work process prior to the FFRDC starting work directly allocable to the FA award.

A CRADA is used to ensure accountability for project work and provide the appropriate management of IP, e.g., data protection and background IP. A Data Management Plan is not suited for this purpose.

Responsibility

[5] A cooperative research and development agreement is a contractual agreement between a national laboratory contractor and a private company or university to work together on research and development. For more information, see https://www.energy.gov/gc/downloads/doe-cooperative-research-and-development-agreements

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 scope of work to be performed by the FFRDC should not be more significant than the scope of work to be performed by the applicant.

III. Program Description

A. Background and Context

The Wind Energy Technologies Office (WETO) is issuing this Notice of Funding Opportunity (NOFO). Awards made under this NOFO will be funded, in whole or in part, with funds appropriated by the Infrastructure Investment and Jobs Act, more commonly known as the Bipartisan Infrastructure Law (BIL).[6]

BIL is a once-in-a-generation investment in modernizing and upgrading American infrastructure to enhance U.S. competitiveness, drive the creation of good-paying jobs with a free and fair chance to form or join a union, tackle the climate crisis, and ensure strong access to economic, environmental, and other benefits for disadvantaged communities.[7] BIL appropriated more than $62 billion to the U.S. Department of Energy (DOE)[8] to invest in American manufacturing and workers; expand access to energy efficiency and clean energy; deliver reliable, clean, and affordable power to more Americans; and demonstrate and deploy the technologies of tomorrow through clean energy demonstrations.

DOE's BIL investments will support efforts to build a clean and equitable energy economy that achieves a zero-carbon electricity system by 2035, and to put the United States on a path to achieve net-zero emissions economy-wide by no later than 2050[9] to benefit all Americans.

BIL will invest appropriations of $40 million, which will include this NOFO, for the four (4) year period encompassing Fiscal Years (FYs) 2022 through 2025 to create innovative and practical approaches to increase the reuse and recycling of wind energy technologies.

The activities to be funded under this NOFO support BIL sections 41007(b)(2) and the broader government-wide approach to strengthen critical domestic manufacturing and supply chains and to maximize the benefits of the clean energy transition as the nation works to curb the climate crisis, empower workers, and advance environmental justice. This BIL section, through reference to section 3003(b)(4) of the Energy Act of 2020, addresses:

- Research and development projects to create innovative and practical approaches to increase the reuse and recycling of wind energy technologies, including—
    - by increasing the efficiency and cost effectiveness of the recovery of raw materials from wind energy technology components and systems

[6] Infrastructure Investment and Jobs Act, Public Law 117-58 (November 15, 2021). https://www.congress.gov/bill/117th-congress/house-bill/3684. This NOFO uses the more common name Bipartisan Infrastructure Law (BIL).
[7] Pursuant to Executive Order (EO) 14008, "Tackling the Climate Crisis at Home and Abroad," January 27, 2021, and the Office of Management and Budget's Interim Justice40 Implementation Guidance M-21-28 and Addendum M-23-09, DOE recognizes disadvantaged communities as the census tracts identified as disadvantaged by the Climate and Economic Justice Screening Tool (CEJST), located at https://screeningtool.geoplatform.gov/, as well as all Federally Recognized Tribes (whether or not they have land). See https://www.whitehouse.gov/wp-content/uploads/2023/01/M-23-09_Signed_CEQ_CPO.pdf. DOE's Justice40 Implementation Guidance is located at https://www.energy.gov/sites/default/files/2022-07/Final%20DOE%20Justice40%20General%20Guidance%20072522.pdf.
[8] U.S. Department of Energy. November 2021. "DOE Fact Sheet: The Bipartisan Infrastructure Deal Will Deliver for American Workers, Families and Usher in the Clean Energy Future." https://www.energy.gov/articles/doe-fact-sheet-bipartisan-infrastructure-deal-will-deliver-american-workers-families-and-0
[9] EO 14008, "Tackling the Climate Crisis at Home and Abroad," January 27, 2021.

- by minimizing potential environmental impacts from the recovery and disposal processes;
- by advancing technologies and processes for the disassembly and recycling of wind energy devices;
- by developing alternative materials, designs, manufacturing processes, and other aspects of wind energy technologies and the disassembly and resource recovery process that enable efficient, cost effective, and environmentally responsible disassembly of, and resource recovery from, wind energy technologies; and
- strategies to increase consumer acceptance of, and participation in, the recycling of wind energy technologies

This NOFO also supports several broader DOE and government-wide programs, strategies, and initiatives, including:

- Goal of 30 GW of installed Offshore Wind energy capacity by 2030.[10]
- Executive Order 14017 on securing America's supply chains.[11]
- The DOE Critical Minerals and Materials Program[12], including the Critical Materials Collaborative.[13]
- The Plan to Increase Products and Materials Circularity.[14]

The United States may need to deploy a terawatt or more of wind energy capacity by 2035.[15] to meet national energy sector decarbonization goals. With at least 150 GW of wind energy capacity deployed domestically so far, annual wind deployments will need to increase significantly over the current trend of roughly 10 GW/year. This increase in deployment will require a similar increase in the volume of materials needed, including critical materials and certain materials that are difficult to recycle, such as fiber-reinforced composites. The long-term sustainability of the wind energy industry will depend upon efficient, cost effective, and environmentally responsible disassembly of, and resource recovery from, wind energy technologies at the end of life for constituent materials.

Currently, 90% or more of the mass of materials in a wind turbine can be economically recycled, with the remaining unrecycled materials being largely fiber-reinforced composites or metallic components with significant amounts of critical materials, such as rare earth element magnets found in generators. This unrecycled mass represents an opportunity to increase the sustainability and value of wind energy materials, while also reinforcing domestic supply chains. There are several challenges adversely impacting the recyclability of these materials:

- Existing domestic recycling facilities cannot easily process these kinds of composites and magnet materials

[10] Energy Secretary Granholm Announces Ambitious New 30GW Offshore Wind Deployment Target by 2030 | Department of Energy
[11] Executive Order on America's Supply Chains | The White House
[12] Critical Minerals & Materials Program | Department of Energy
[13] Critical Materials Collaborative | Department of Energy
[14] U.S. Department of Energy Solicits Feedback on Its Plan To Increase Products and Materials Circularity
[15] Examining Supply-Side Options to Achieve 100% Clean Electricity by 2035 (nrel.gov)

- Material transportation costs are an important consideration for decision makers when planning the end-of-life treatment of materials. Landfills tend to be closer to wind plants than appropriate recycling facilities, making it simply cheaper to send materials to landfills in most cases
- Some existing recycling pathways may result in higher carbon emissions than landfilling
- Secondary markets that would utilize recycled materials are not yet mature
- Emerging recycling solutions tend to have high operating costs, low processing capacity, or both
- Current disassembly equipment, such as cranes, may be costly and limited in availability leading to sub-optimal decommissioning practices which negatively impact the quality of decommissioned materials
- Sorting of decommissioned materials may be costly and time consuming

To help ensure a secure domestic supply of critical minerals and materials (CMM), the DOE is attempting to accelerate production of CMMs from a diverse set of sources (e.g., recycling, secondary, unconventional, conventional) and working with other government agencies and private entities as part of a government-wide CMM strategy.

As part of this strategy, the DOE has established a Critical Materials Collaborative (CMC) to be a centralized entity for multidisciplinary, collaborative, critical materials applied research, development, and demonstration (RD&D). The Collaborative will coordinate CMM innovation across the DOE, other government agencies, industry, and academia, as well as providing enabling technologies to reduce commercialization time and risk.

All selected projects from this NOFO are invited to participate as a member of the Critical Materials Collaborative (CMC), which is a coalition of DOE offices, federal agencies, and federally funded R&D programs to:

- Align the DOE research portfolio to achieve climate goals and crosscutting science and technology objectives;
- Advance crosscutting applied RD&D related to critical minerals and materials;
- Accelerate the adoption and deployment of innovation;
- Nurture and expand the innovation ecosystem; and
- Facilitate scientific and technical exchange and discussion.

The Recipient's principal investigators or a member of their research team are invited to participate in coordination efforts including, but not limited to, an in-person annual symposium, virtual coordination meetings, and periodic presentations on research progress. There are no membership fees associated with participation in the CMC.

Applicants to this NOFO should take into consideration possible collaboration with the programs supported by other DOE program offices. Projects funded by this NOFO will be encouraged to explore opportunities to coordinate with projects funded by other DOE offices and federal agencies through the CMC in order to maximize the scientific and technological impact.

Recipients are invited to participate in the CMC through the life of the period of performance, and potentially up to one year after contracted work has concluded.

B. Program Purpose

This NOFO supports the administration goals laid out above by supporting and accelerating the acceptance of recycling and reuse of wind energy materials. By increasing the utilization of recycled and reused materials, carbon emissions and other negative resource impacts related to new component manufacturing can be reduced or eliminated. Furthermore, the ability to reuse materials domestically can reduce the dependence of the domestic clean energy economy on internationally sourced materials, in particular critical materials. Recycled materials can also provide additional value to the economy which may be lost by feeding materials into low- or no-value end of life pathways like landfilling.

As part of the whole-of-government approach to advance equity and encourage worker organizing and collective bargaining, [16, 17, 18] and in alignment with BIL sections 41007(b)(2) this NOFO and any related activities will seek to encourage meaningful labor, Tribal, and community engagement and participation of labor unions, as well as underrepresented persons and groups of persons and disadvantaged communities, including Federally Recognized Indian Tribes. Consistent with Executive Order (EO) 14008, [19] this NOFO is designed to help meet the goal that 40% of the overall benefits of certain federal investments flow to disadvantaged communities, [20] and to drive creation of accessible, good-paying jobs with the free and fair chance for workers to join or form a union.

C. Program Goals and Objectives

This NOFO seeks applications to address technological and supply chain challenges currently limiting the adoption of recycling and reuse practices for certain materials commonly found in wind energy technologies, specifically fiber-reinforced composites (fiberglass and carbon fiber) and rare earth elements found in permanent magnet generators. This NOFO will support the development of novel recyclable designs and end-of-life material processing techniques as well as de-risking the adoption of recycled materials into secondary markets. By helping to facilitate an economically self-sustaining recycling industry for all wind materials, this NOFO will reduce negative environmental and social impacts of wind material handling while extending the value of, and strengthening domestic access to, these key clean energy materials. Detailed technical descriptions of the specific Topic Areas are provided in the sections that follow.

[16] EO 13985, "Advancing Racial Equity and Support for Underserved Communities Through the Federal Government," January 20, 2021. EO 14091, "Further Advancing Racial Equity and Support for Underserved Communities Through the Federal Government, February 16, 2023.
[17] EO 14025, "Worker Organizing and Empowerment," April 26, 2021.
[18] EO 14052, "Implementation of the Infrastructure Investment and Jobs Act," November 18, 2021.
[19] EO 14008, "Tackling the Climate Crisis at Home and Abroad," January 27, 2021.
[20] Pursuant to EO 14008, "Tackling the Climate Crisis at Home and Abroad," January 27, 2021, and the Office of Management and Budget's Interim Justice40 Implementation Guidance M-21-28 and Addendum M-23-09, DOE recognizes disadvantaged communities as the census tracts identified as disadvantaged by the Climate and Economic Justice Screening Tool (CEJST), located at https://screeningtool.geoplatform.gov/, as well as all Federally Recognized Tribes (whether or not they have land). See https://www.whitehouse.gov/wp-content/uploads/2023/01/M-23-09_Signed_CEQ_CPO.pdf. DOE's Justice40 Implementation Guidance is located at https://www.energy.gov/sites/default/files/2022-07/Final%20DOE%20Justice40%20General%20Guidance%20072522.pdf.

Rapid growth in wind energy is expected over the coming years. This increasing deployment means an increasing amount of material entering manufacturing processes, and subsequently more manufacturing waste. At the same time, legacy wind plants may be reaching end-of-life and being decommissioned or repowered. Whether these wind energy materials are from the factory or from an installed wind plant, they must be handled responsibly.

A typical wind turbine is composed of many kinds of materials, most of which are economically recycled at scale today. Concrete in the foundation can be turned into recycled concrete aggregate and reused, while low-alloy steel in the tower and some parts of the drivetrain can be profitably recycled through Electric Arc Furnaces or other methods. Large cast iron components such as the bed plate and rotor hub can be similarly recycled for profit. Power electronics components can be recycled using similar methods to other e-waste.

While most wind materials are recyclable, certain materials do not yet have sustainable end-of-life processing options at a scale that can handle the industry's current and projected waste. These difficult to recycle materials are largely fiber-reinforced composites, such as those found in wind turbine blades, and rare earth element (REE) critical materials, such as those found in permanent magnet synchronous generators. Some of the challenges related to the recycling of wind blades and generators can be found below:

Wind Turbine Blades	**Wind Turbine Generators**
• Decommissioning practices can vary greatly, resulting in a range controlled and uncontrolled size reductions to wind blades on site (shattering, segmenting, filleting, shredding, etc.) • Decommissioning policies and agreements vary by region and/or site and may influence decommissioning practices through material removal and site restoration requirements or through funding available for decommissioning • Transportation of decommissioned components is a major cost consideration for EOL pathways, and landfills tend to be the closest processing facilities • Different materials, such as fiberglass and carbon fiber composites, may be challenging to separate both due to a lack of detailed design information and a lack of cost-effective separation technology	• Decommissioning practices may vary for generators similar to wind blades • Sorting of high-value, high-alloy steel is time-consuming if the composition of material components is not known *a priori* • Suboptimal decommissioning practices may damage magnets and limit potential end of life (EOL) pathways • There is no industrial scale recycling option for REE magnets • Certification standards do not exist for direct reuse of magnets • The wind energy industry supply chain for REEs is not large enough on its own to support a recycling industry • There is little domestic production of REE magnets, limiting both manufacturing scrap source material and options for recovered material reprocessing

• Recycling and reuse solutions tend to still need improvements in cost effectiveness, efficiency, and recovered material quality to compete with options like cement kiln co-processing and landfilling • To scale recycling solutions, a large enough material supply and subsequent offtake market must be established • There is no standard recycled material assessment framework, which limits the ability of secondary markets to develop new products which integrate this recycled material • Recycling of emerging separable resin systems has not been demonstrated at scale, and recycling processes have not been well-characterized	

DOE is investing in further assessment of state of domestic wind energy system material recycling. This information will be able to be found on the Wind Energy Technology Office's website as it becomes available. Detailed technical descriptions of the specific Topic Areas are provided in the sections that follow.

D. Expected Performance Goals

Topic 1 Candidate Metrics and Targets: Applicants must identify and justify appropriate target metrics for their technology and specify an appropriate baseline for comparison. Targets should address objectives identified in the technology focus section above and showcase the technical merit of the proposed solution. Applications must clearly identify the starting and ending technology readiness level (TRL) for the project and justify the TRLs assigned. Benchmarks/baselines and targets should be specified for each metric. Applicant-defined metrics are not required to have a minimum and stretch target, a

single target for improvement over the benchmark or baseline is acceptable. Generalized metric categories are provided solely as examples; proposed metrics need not be limited to these examples.

Wind Turbine Blades Example Metrics

Objective/Goal	**Metric**	**Minimum Target**	**Stretch Target**	**Baseline Performance, Cost, or other Considerations**
Recyclability and reusability of blade materials	Estimated amount of material that can be directly reused or recycled	70%	99%	*Applicant should describe recycling or reuse process*
Reduced factory waste	Estimated reduction in factory waste by mass	No change	50%	*Applicant defined*
Adequate performance of sustainable designs	Estimated performance comparison with conventional materials	No improvement	10%	*Applicant defined*
Life cycle cost savings	Estimated reduction in life cycle costs from production to recycling	No change	20%	*Applicant defined*
Life cycle GHG emissions reduction	Estimated reduction in life cycle GHG emissions from production through recycling	10%	50%	*Applicant defined*
Life cycle non-GHG environmental impacts reduction	Estimated reduction in life cycle environmental impacts from production through recycling	10%	50%	*Applicant defined*

Permanent Magnet Generators Example Metrics

Objective/Goal	Metric	Minimum Target	Stretch Target	Baseline Performance or Cost
Increased recyclability and reusability of generator and/or magnet materials	Estimated amount of material that can be directly reused or recycled	95%	99%	*Applicant defined*
Reduced factory waste	Estimated reduction in factory waste by mass	No change	50%	*Applicant defined*
Reduced Rare Earth Element Dependence	Estimated reduction in CM dependence compared to conventional designs	No change	25%	*Applicant defined*
Adequate performance of sustainable designs	Estimated performance comparison with conventional materials	No change	20%	*Applicant defined*
Life cycle cost savings	Estimated reduction in life cycle costs from production to recycling	No change	10%	Applicant defined
Life cycle GHG emissions reduction	Estimated reduction in life cycle GHG emissions from production through recycling	10%	50%	*Applicant defined*
Life cycle non-GHG environmental impacts reduction	Estimated reduction in life cycle environmental impacts from production through recycling	No change	30%	*Applicant defined*

Topic 2 Candidate Metrics and Targets: Applicants must identify and justify appropriate target metrics for their technology and specify an appropriate baseline for comparison. Targets should address objectives identified in the technology focus section above and showcase the technical merit of the proposed solution. Applications must clearly identify the starting and ending TRL for the project and justify the TRLs assigned. Benchmarks/baselines and targets should be specified for each metric. Applicant-defined metrics are not required to have a minimum and stretch target, a single target for

improvement over the benchmark or baseline is acceptable. Generalized metric categories are provided solely as examples; proposed metrics need not be limited to these examples.

Wind Turbine Blade Composites and Waste Example Metrics

Objective/Goal	**Metric**	**Minimum Target**	**Stretch Target**	**Baseline Performance, Cost, or other Considerations**
Mass of material recycled/reused	Estimated amount of material reused or recycled	50%	95%	*Applicant should describe recycling or reuse process*
Cost	Estimated cost reduction of process	No change	50%	*Applicant defined*
Sustainability	Estimated reduction in negative environmental impacts	No improvement	80%	*Applicant defined*
Second Market	Estimated improvement of value of second life material	No change	100%	*Applicant defined*

Permanent Magnet Generator Materials and Factory Waste Example Metrics

Objective/Goal	Metric	Minimum Target	Stretch Target	Baseline Performance, Cost, or other Considerations
Mass of material recycled/reused	Estimated amount of material reused or recycled	90%	99%	*Applicant should describe recycling or reuse process*
Cost	Estimated cost reduction of process	10%	50%	*Applicant defined*
Sustainability	Estimated reduction in negative environmental impacts	No improvement	80%	*Applicant defined*
Second Market	Estimated improvement of value of second life material	No change	100%	*Applicant defined*

E. 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.

F. Topic Areas

This FOA consists of three topic areas. The first topic area focuses on de-risking designs and materials that will make wind energy components more recyclable and reusable. The second topic focuses on accelerating development of material processing technologies to handle end-of-life material and factory waste. The final topic focuses on developing a program to qualify recycled materials for secondary markets.

Topic #	Topic Area
1	Enabling Sustainable Wind Turbine Components
2	Enabling Wind Turbine Material Recycling and Reuse Processes
3	Recycled and Recyclable Material Qualification

The following are applicable to applications under topic areas 1 and 2:

- Applicants must propose to perform techno-economic analysis (TEA) and life cycle assessment (LCA) of their potential projects. These analyses must include a comparison of the current, commercially available state-of-the-art technology with the proposed approach, including comparisons of functionality. The comparison should include an initial TEA and an initial LCA that considers: 1) current, commercially available state-of-the-art technology; 2) relevant preliminary data that demonstrates the current developmental stage of the proposed solution, (whether experimental, literature-based, or both); and 3) the proposed solution's targets that will be achieved by end of project. The preliminary TEA and LCA must be included in the technical volume of the application, should be conducted using credible methodologies and assumptions and will need to be updated throughout the life of selected projects. Proposed technologies/approaches must demonstrate economic feasibility and a net decrease in overall lifecycle energy consumption as compared to the state of the art. See XI "Other Information" for more information, resources, and available tools that can help meet this requirement.
- Applications must include the process improvements required for their proposed solutions to move to the next step in commercialization.
- Applications must also define credible and measurable baselines, supported by prior data from literature and/or experimentation, against which their user defined metrics will be evaluated. The quality and scientific depth of these proposed baselines and metrics will be an important element of the technical evaluation of applications.

The following are applicable to applications under ALL topic areas:

- Letters of commitment from partner organizations, and especially those that pledge cost share (as applicable), will make for stronger applications.
- The role of modeling and simulations, experimentation, lab, bench, and pilot-scale testing should be explained. Anticipated technical barriers should be described, along with a planned approach to overcome them. Applicants should explain the underlying research to date, including any literature review or experimental data to support the proposed R&D approach and justify the R&D needs.

i. Topic 1: Enabling Sustainable Wind Turbine Components

This topic seeks to support projects that will de-risk sustainable and recyclable wind turbine components designs and materials and accelerate broad commercial acceptance of these designs.

Current industry behaviors relating to recycling and sustainability are limited by inherent difficulties with recycling and reusing certain components, especially those composed primarily of fiber-reinforced composites or that use large amounts of critical minerals and critical engineered materials.

In recent years, the wind industry and other advanced materials industries have developed promising alternatives to incumbent product designs and their constituent materials. These innovations may offer several advantages, including but not limited to enhanced recyclability of material in factory and upon decommissioning of the component or turbine, reduced complexity of maintenance and repair activities during operation, enhanced ability to reuse or remanufacture components, and manufacturing processes that are more efficient.

The two primary components of interest for this topic are wind turbine blades and wind turbine generators that use significant amounts of critical materials. A successful project will show the sustainability and recyclability advantages offered by the innovation and de-risk the innovation for

commercialization. De-risking may include, but is not limited to cost reduction, proof of operational reliability, sustainability improvements, and more. The targets of the NOFO differ by the subject component:

Wind Turbine Blades	Permanent Magnet Generators

• Innovations should be applicable to blades of similar or larger scale to those currently domestically available
  ○ Land-based blades >80m
  ○ Offshore blades >110m
• There is no restriction on eligible materials for resin systems, fibers, or core materials
• The innovation may include design for ease of decommissioning, recycling, and reuse regardless of material selection
• Applicable to US market within 5 years of NOFO announcement
	• Innovations should be applicable to generators for offshore wind turbines
	• Proposals should emphasize Rare Earth Elements found in magnets, although proposed designs should not be any more dependent on other critical materials (CMs) than conventional designs
	• Proposals that offer improved recycling or reduced dependence on non-REE CMs in addition to REEs are encouraged but not required
	• The innovation may include design for ease of decommissioning, regardless of material selection
	• Applicable to US market within 2030 timeframe

Topic 1 Specific Requirements:
Proposed projects should:

- Include, in any capacity, wind turbine-original equipment manufacturers (OEMs), Tier 1 suppliers, and/or suppliers of the constituent materials of the subject component.
- Include suitable academic or other qualified testing facilities.
- If the applicant determines that a new or non-standard testing procedure is needed to show improved ability to decommission and/or recycle, that test should be clearly described and should identify how resulting data can be tied to relevant metrics (i.e. cost of decommissioning, percentage of mass recovered, retained performance, etc.).
- Identify all relevant standards for testing and certification of the component for use in the wind energy industry
- Identify relevant testing and validation activities to show how the novel design improves decommissioning and recycling
- Supplement, and specifically delineate the uniqueness of the proposed scope where proposing work related to prior WETO/Advanced Manufacturing Office (AMO)/Advanced Materials and Manufacturing Technologies Office (AMMTO)/Industrial Efficiency and Decarbonization Office

(IEDO)/Institute for Advanced Composites Manufacturing Innovation (IACMI)/Critical Materials Institute (CMI)sponsored R&D projects.

ii. Topic 2: Enabling Wind Turbine Material Recycling and Reuse Processes

This topic seeks to support the development of material processing technologies and techniques that can be applied at commercial scale to wind turbine materials or factory waste at the end of life. This may include technologies which enhance decommissioning (e.g. on site component size reduction technologies, material sorting, material separation), material recycling and reuse processes, or some combination of these. The secondary market for recovered materials should be an integral consideration for proposals within this topic.

Currently, most wind turbine materials are recycled upon decommissioning. The current rate of recycling is enabled by existing commercial scale processes that are understood and cost-effective for responsible parties. However, certain wind turbine materials, such as fiber-reinforced composites and rare earth elements found in permanent magnets and related materials are lacking domestic commercial scale recycling processes and supply chains.

With an increasing number of turbines expected to be decommissioned in coming years, paired with an expected increase in manufacturing waste with increased new production, there is a significant opportunity to advance novel processing technologies and techniques to enhance the recyclability, reusability, and sustainability of the wind energy industry.

Several entities have been working to develop innovative recycling and reuse processes for wind turbine materials and components but additional support is needed to accelerate the commercial viability of these technologies so they may have a positive impact on wind energy sustainability in the near-term.

Successful projects in this topic should demonstrate the ability to economically and sustainably recycle wind turbine materials at a scale relevant to the domestic wind energy industry. The innovation should address end of life products, factory waste, or both.

Topic 2 Specific Requirements:
Proposed projects should:

- Describe the source of material for the project.
- Include, in any capacity, suitable academic or other qualified testing facilities.
- Include project partners or letters of support from potential customers of recycled/reused materials and components.
- Demonstrate an understanding of the relevant supply chain, including supply source and offtake volume, which would support an economically viable business based on the proposed innovation.
- Supplement, and specifically delineate the uniqueness of the proposed scope where proposing work related to prior WETO/AMO/AMMTO/IEDO/IACMI/CMI sponsored R&D projects.

iii. Topic 3: Recycled and Recyclable Material Qualification

Recent assessments of industry behaviors suggest an important obstacle to acceptance of novel sustainable materials and recycled materials is the qualification and certification of new materials and recycled materials. This topic seeks to develop a research collaborative that will provide a key mechanism to qualify and certify new recycled materials that are relevant for wind energy technologies.

Through the capabilities and expertise of collaborative partners, the collaborative should develop certification standards and characterization methodologies that are informed by industry requirements for secondary market adoption of recycled materials. The collaborative should also examine the possibility of acting as a certification body for recycled materials.

This research collaborative should be led by an impartial research organization, such as a national lab, university, research institute, or standards organization. Members should include other research organizations with distinct capabilities and expertise, owners of innovative recycling processes and recycled materials which are facing technical and financial barriers to deployment, component manufacturers, wind plant developers, and potential secondary market stakeholders.

Topic 3 Specific Requirements:
Proposed projects should:

- Describe the source of recycled and recyclable materials for the project.
- Include suitable academic or other qualified testing facilities.
- Demonstrate interest in involvement from recycled and/or recyclable material suppliers as well as potential customers for those materials.
- Identify how the collaborative will engage with relevant industry stakeholders to increase acceptance of any standards that are developed.
- Supplement, and specifically delineate the uniqueness of the proposed scope where proposing work related to prior WETO/AMO/AMMTO/IEDO/IACMI/CMI sponsored R&D projects.

G. Applications Specifically Not of Interest

The following types of applications will be deemed nonresponsive and will not be reviewed or considered (Please see NOFO Part 2, Responsiveness Criteria and Review):

- Applications that fall outside the technical parameters specified in Background and Context and Topic Areas of the NOFO Part 1.
- Applications for proposed technologies that are not based on sound scientific principles (e.g., violates the laws of thermodynamics).

Technologies specifically not of interest:

- Material systems, such as bio-based materials, that may have certain potential sustainability advantages over conventional materials, but that do not offer any advantage for recyclability or reusability of components and materials.

H. Statement of Substantial Involvement

DOE anticipates awarding cooperative agreements under this NOFO, which include a statement of DOE's "substantial involvement" in the work performed under the resulting awards. For cooperative agreements, DOE does not limit its involvement to the administrative requirements of the award.

Instead, DOE has substantial involvement in the direction and redirection of the technical aspects of the project. DOE's substantial involvement in resulting awards may include the following:

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

I. Statutory Authority

The programmatic authorizing statute is § 3003(b)(2) of the Energy Act of 2020 (42 U.S.C. 16237(b)(4)) and § 41007(b)(1) of the BIL.

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

J.Research & Development (R&D) Community Benefits Plan

DOE is committed to investing in research and development (R&D) of innovations that deliver benefits to the American public and lead to commercialization of technologies and products that foster sustainable, resilient, and equitable access to clean energy. Further, DOE is committed to supporting the development of more diverse, equitable, inclusive, and accessible workplaces to help maintain the nation's leadership in science and technology.

To support the goal of building a clean and equitable energy economy, projects funded under this BIL NOFO are expected to (1) advance diversity, equity, inclusion, and accessibility (DEIA); (2) contribute to the Justice40 Initiative[21] and other considerations linked with energy and environmental justice; and (3) invest in quality jobs. To ensure these objectives are met, applications must include a Research and Development Community Benefits Plan (R&D Community Benefits Plan) that addresses the three objectives stated above. See NOFO Part 2, *Application Content and Form*—Application Content Requirements for more information on the R&D Community Benefits Plan content requirements.

[21] The Justice40 Initiative, established by EO 14008, sets a goal that 40% of the overall benefits of certain federal investments flow to disadvantaged communities. Consistent with Justice40 guidance, DOE recognizes disadvantaged communities as the census tracts identified as disadvantaged by the Climate and Economic Justice Screening Tool (CEJST), located at https://screeningtool.geoplatform.gov/, as well as all Federally Recognized Tribes (whether or not they have land). See https://www.whitehouse.gov/wp-content/uploads/2023/01/M-23-09_Signed_CEQ_CPO.pdf.

IV. Application Content and Form

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

A. Summary

The application process includes multiple submission phases: application and reply to reviewer comments.

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

B. Application Content Requirements

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

1. Covered Individual Definition, Designation, and Responsibility

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

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

DOE designates as covered individuals any principal investigator (PI); project director (PD); co-principal investigator (Co-PI); co-project director (Co-PD); project manager; and any individual regardless of title that is functionally performing as a PI, PD, Co-PI, Co-PD, or project manager. Status as a consultant, graduate (master's or PhD) student, or postdoctoral associate does not automatically disqualify a person from being designated as a "covered individual" if they meet the definition in (a) above.

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

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

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

2. Summary of Application Requirements

Component	File Format	Page Limit	File Name
SF-424: Application for Federal Assistance	PDF	n/a	ControlNumber_LeadOrganization_424
Technical Volume	PDF	15	ControlNumber_LeadOrganization TechnicalVolume
Letters of Commitment	PDF	1 page each	ControlNumber_LeadOrganization_LOCs
Impacted Indian Tribes Documentation	PDF	n/a	ControlNumber_LeadOrganization_ ImpactedTribes
Statement of Project Objectives	MS Word	10	ControlNumber_LeadOrganization SOPO
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_FFRDCAuth
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
Community Benefits Plan for Research and Development (R&D)	PDF	5	ControlNumber_LeadOrganization_CBP
Community Partnership Documentation	PDF	10	ControlNumber_LeadOrganization PartnerDocs
Resumes (Research and Development (R&D))	PDF	3 pages each	ControlNumber_LeadOrganization_Resumes
Resumes (Non-Research and Development (R&D))	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
Data Management Plan	PDF	n/a	ControlNumber_LeadOrganization _DMP
Location(s) of Work	Excel	n/a	ControlNumber_LeadOrganization LOW
Environmental Considerations Summary	PDF	n/a	ControlNumber_LeadOrganization EnvSum
SF-LLL Disclosure of Lobbying Activities , if applicable	PDF	n/a	ControlNumber_LeadOrganization _SF-LLL
OMB 4040-0013 Form Certification Regarding Lobbying Form	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 15 pages, including the cover page, table of contents, and all citations, charts, graphs, maps, photos, or other graphics, and must include all information below. The applicant should consider the weighting of each of the technical review criteria (see Technical Review Criteria) when preparing the Technical Volume.

Technical Volume Content Requirements Overview	
SECTION	**Approximate Percent Content of the Technical Volume**
Cover Page	N/A
Project Overview	10%
Technical Description, Innovation, and Impact	30%
Workplan in Statement of Project Objectives	40%

Technical Qualifications and Resources	20%

Cover Page:
The cover page must include all of the following:

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

Project Overview (Approximately 10% of the Technical Volume)
The Project Overview should contain the following information:

- **Background:** The applicant should discuss the background of its organization, including the history, successes, and current research and development status (i.e., the technical baseline) relevant to the technical topic being addressed in the application.
- **Project Goal:** The applicant should explicitly identify the targeted improvements to the baseline technology and the critical success factors in achieving that goal.
- **DOE Impact:** The applicant should discuss the impact that DOE funding would have on the proposed project. Applicants should specifically explain how DOE funding, relative to prior, current, or anticipated funding from other public and private sources, is necessary to achieve the project objectives.
- **Supply Chain Description:** (For topic areas 1 and 2 only) The applicant should identify how they anticipate ensuring sufficient material or product supply and subsequently sufficient material or product offtake.

Technical Description, Innovation, and Impact (Approximately 30% of the Technical Volume)
The Technical Description should contain the following information:

- **Relevance and Outcomes:** The applicant should provide a detailed description of the technology or focus area, including the scientific and other principles and objectives that will be pursued during the project. This section should describe the relevance of the proposed project to the goals and objectives of the NOFO, including the potential to meet specific DOE technical targets or other relevant performance targets. The applicant should clearly specify the expected outcomes of the project.
- **Feasibility:** The applicant should demonstrate the technical feasibility of the proposed technology and capability of achieving the anticipated performance targets, including a description of previous work done and prior results. This section should also address the project's access to necessary infrastructure (e.g., transportation, water, electricity transmission), including any use of existing infrastructure, as well as to a skilled workforce.
- **Innovation and Impacts:** The applicant should describe the current state-of-the-art in the applicable field, the specific innovation of the proposed technology or focus area, the advantages of proposed technology over current and emerging technologies, the current state of testing and certification of the product, and the overall impact on advancing the state-of-the-art/technical baseline if the project is successful.

Workplan (Approximately 40% of the Technical Volume)

The Workplan should include a summary of the Project Objectives, Technical Scope, Work Breakdown Structure (WBS), Project Tasks, Milestones, Go/No-Go decision points, and project schedule. A detailed statement of project objectives (SOPO) is separately requested as part of the application. The Workplan should contain the following information:

- **Project Objectives:** The applicant should provide a clear and concise (high-level) statement of the goals and objectives of the project as well as the expected outcomes.
- **Technical Scope Summary:** The applicant should provide a summary description of the overall work scope and approach to achieve the objective(s). The overall work scope is to be divided by performance periods that are separated by discrete, approximately annual decision points (see below for more information on Go/No-Go decision points). The applicant should describe the specific expected end result of each performance period, including milestones in the Community Benefits Plan.
- **WBS and Task Description Summary:** The Workplan should describe the work to be accomplished and how the applicant will achieve the milestones, will accomplish the final project goal(s), and will produce all deliverables. The Workplan is to be structured with a hierarchy of performance period (approximately annual), task and subtasks, which is typical of a standard WBS for any project. The Workplan shall contain a concise description of the specific activities to be conducted over the life of the project. The description shall be a full explanation and disclosure of the project being proposed (i.e., a statement such as "we will then complete a proprietary process" is unacceptable). It is the applicant's responsibility to prepare an adequately detailed task plan to describe the proposed project and the plan for addressing the objectives of this NOFO. The summary provided should be consistent with the SOPO. The SOPO will contain a more detailed description of the WBS and tasks.
- **Milestone Summary:** The SOPO should provide a summary of appropriate milestones throughout the project to demonstrate progress and success. A milestone may be either a progress measure (which can be activity based) or a SMART technical milestone. SMART milestones should be Specific, Measurable, Achievable, Relevant, and Timely, and must demonstrate a technical achievement rather than simply completing a task. Unless otherwise specified in the NOFO, the minimum requirement is that each project must have at least one milestone per quarter for the duration of the project with at least one SMART technical milestone per year (depending on the project, more milestones may be necessary to comprehensively demonstrate progress). The applicant should also provide the means by which the milestone will be verified. The summary provided should be consistent with the Milestone Summary Table in the SOPO.
- **Go/No-Go Decision Points:** The applicant should provide a summary of project-wide Go/No-Go decision points at appropriate points in the Workplan. At a minimum, each project must have at least one project-wide Go/No-Go decision point for each budget period (12 to 18-month period) of the project. See Key Facts for Go/No-Go and budget period information. The applicant should also provide the specific technical and community benefits plan criteria to be used to evaluate the project at the Go/No-Go decision point. The summary provided should be consistent with the SOPO. Go/No-Go decision points are considered "SMART" and can fulfill the requirement for an annual SMART milestone.
- **End of Project Goal:** The Workplan should include a summary of the end of project goal(s). At a minimum, each project must have one SMART end of project goal. The summary provided should be consistent with the SOPO.

- **Project Schedule (Gantt Chart or similar):** The applicant should provide a schedule for the entire project, including task and subtask durations, any milestones, and any Go/No-Go decision points.
- **Build America Buy America (BABA) Requirements for Infrastructure Projects:** Within the first two pages of the Workplan, include a short statement on whether the project will involve the construction, alteration, maintenance and/or repair of infrastructure in the United States. See Build America, Buy America | Department of Energy and 2 CFR 184 for applicable definitions and other information regarding Infrastructure Projects and the Buy America Requirement.
- **Project Management:** The applicant should discuss the team's proposed management plan, including the following:
    - The overall approach to and organization for managing the work;
    - The roles of each project team member;
    - Any critical handoffs/interdependencies among project team members;
    - The technical and management aspects of the management plan, including systems and practices, such as financial and project management practices;
    - The approach to project risk management, including a plan for securing a qualified workforce and mitigating risks to project performance including but not limited to community or labor disputes or conflicts related to siting;
    - Approach to addressing permits and tory approvals, including compliance with any current permits, and any permits and natural or cultural resource issues that could require discretionary permits or approvals
    - A description of how project changes will be handled;
    - If applicable, the approach to Quality Assurance/Control;
    - How communications will be maintained among project team members.
- **Market Transformation Plan:** The applicant should provide a market transformation plan, including the following:
    - Identification of target market, competitors, and distribution channels for proposed technology, data, and/or new testing methodologies along with known or perceived barriers to market penetration and acceptance among relevant industry stakeholders, including a mitigation plan.
    - For topic areas 1 and 2, Identification of a product development and/or service plan, commercialization timeline, financing, product marketing, legal/regulatory considerations including intellectual property, infrastructure requirements, data dissemination, and product distribution.
    - Identification of current industry interest, commitments for adoption if the project is successful, and impact of those commitments across the industry.

Technical Qualifications and Resources (Approximately 20% of the Technical Volume)

The Technical Qualifications and Resources should contain the following information:

- A description of the project team's unique qualifications and expertise, including those of key subrecipients;
- A description of the project team's existing equipment and facilities, or equipment or facilities already in place on the proposed project site, that will facilitate the successful completion of the proposed project; include a justification of any new equipment or facilities requested as part of the project;
- Relevant, previous work efforts, demonstrated innovations, and how these enable the applicant to achieve the project objectives;

- The time commitment of the key team members to support the project;
- A description of the technical services to be provided by DOE FFRDCs, if applicable;
- The skills, certifications, or other credentials of the construction and ongoing operations workforce;
- For multi-organizational projects, describe succinctly:
    - The roles and the work to be performed by the project manager and Senior/Key Personnel at the recipient and sub levels;
    - Business agreements between the applicant and sub;
    - How the various efforts will be integrated and managed;
    - Process for making decisions on technical direction;
    - Publication arrangements;
- Strategy to address known resource, including intellectual property and real property, constraints or challenges; and
- Communication plans.

C. Funding Restrictions

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

Applicable Funding Restrictions		
Title	**Location**	**Additional Information**
Allowable Costs	NOFO Part 2	Applicable to awards made under this NOFO
Pre-Award Costs	NOFO Part 2	Applicable to awards made under this NOFO
Performance of Work in the United States (Foreign Work Waiver Requirement)	NOFO Part 2	Applicable to awards made under this NOFO
Foreign Travel	NOFO Part 2	Foreign Travel is allowed for awards made under this NOFO only with the written prior approval of the Contracting Officer assigned to the award
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.
Davis-Bacon Act Requirements	NOFO Part 2	Applicable to awards made under this NOFO
Construction Signage	NOFO Part 2	Applicable to awards with construction activities made under this NOFO
Build America Buy America Requirements for Infrastructure Projects	NOFO Part 1	Applicable to awards made under this NOFO

1. Build America Requirement 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 NOFO Part 2, *Buy America Requirements for Infrastructure Projects; Required Use of American Iron, Steel, Manufactured Products, and Construction Materials* and 2 CFR Part 184 to determine whether the Buy America Requirement applies and if they should consider the application of the Buy America Requirement in the proposed project's budget and/or schedule. (Note that the Buy America Requirement 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.**

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.

In addition to eXCHANGE, the application forms and instructions are available at EERE Funding Application and Management Forms.

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, by the standards set forth in EERE's Notice of Objective Merit Review Procedure (76 Fed. Reg. 17846, March 31, 2011) 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 not based on established scientific principles.
- Project concepts or approaches identified specifically as NOT of interest (See Applications Specifically Not of Interest).

C. Review Criteria

1. Compliance Criteria

All applicant submissions for applications must:

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

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

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

2. Technical Review Criteria

Applications

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

Review Criterion Overview	
Criterion	**Weight**
Technical Merit, Innovation, and Impact	40%
Project Demonstration and Market Transformation Plan	30%
Team and Resources	15%
Community Benefits Plan: R&D	15%

Criterion 1: Technical Merit, Innovation, and Impact (40%)

This criterion involves consideration of the following factors:

Technical Merit and Innovation

1. Extent to which the proposed technology, process, or project is innovative or replicable;
2. Degree to which the current state of the technology and the proposed advancement are clearly described;
3. Extent to which the application specifically and convincingly demonstrates how the applicant will move the state of the art to the proposed advancement;
4. Sufficiency of technical detail in the application to assess whether the proposed work is scientifically meritorious and revolutionary, including relevant data, calculations, and discussion of prior work with analyses that support the viability of the proposed work;
5. Extent to which project has buy-in from needed stakeholders to ensure success;
6. Degree to which key manufacturing and supply chain challenges are considered, as applicable, for viable scale-up in this and future demonstrations;
7. Degree to which siting and environmental constraints are considered for deployment;
8. Extent to which project has the potential to reduce emissions and provide clean energy acceleration benefits for a community or region; and
9. Sufficiency of existing infrastructure to support addition of proposed demonstration.

Impact of Technology Advancement

1. Ability of the project to advance industry adoption;
2. Extent to which the project supports the topic area objectives and target specifications and metrics;
3. Potential impact of the project on advancing the state of the art;
4. Extent to which demonstration/deployment is replicable and may lead to future demonstrations; and
5. Extent to which the project facilitates stakeholder relationships across new or existing stakeholders to gain technical buy-in and increase potential for future deployments.

Project Management

1. Adequacy of proposed project management systems including the ability to track scope, cost, and schedule progress and changes;
2. Reasonableness of budget and spend plan as detailed in the budget justification workbook for proposed project and objectives;
3. Adequacy of contingency funding based on quality of cost estimate and identified risks;
4. Adequacy, reasonableness, and soundness of the project schedule, as well as periodic Go/No-Go decisions prior to further funds disbursement, interim milestones, and metrics to track process;
5. Adequacy, reasonableness, and soundness of the project schedule, as well as annual Go/No-Go decisions prior to a budget period continuation application, interim milestones, and metrics to track process;
6. Adequacy of the identification of risks, including labor and community opposition or disputes, and "timely" and appropriate strategies for mitigation and resolution; and
7. Soundness of a plan to expeditiously address environmental, siting, and other regulatory requirements for the project, including evaluation of resilience to climate change.
8. Completeness, comprehensiveness, accuracy, and strength of the application deliverables, such that DOE and independent experts will be able to identify project risk.

Criterion 2: Project Demonstration and Market Transformation Plan (30%)

This criterion involves consideration of the following factors:

Research [and/or Demonstration] Approach, Workplan, and SOPO

1. Degree to which the approach and critical path have been clearly described and thoughtfully considered; and
2. Degree to which the task descriptions are clear, detailed, timely, and reasonable, resulting in a high likelihood that the proposed Workplan and SOPO will succeed in meeting the project goals.

Identification of Technical Risks

1. Discussion and demonstrated understanding of the key technical risk areas involved in the proposed work and the quality of the mitigation strategies to address them.

Baseline, Metrics, and Deliverables

1. Level of clarity in the definition of the baseline, metrics, and milestones; and
2. Relative to a clearly defined project baseline, the strength of the quantifiable metrics, milestones, and mid-point deliverables defined in the application, such that meaningful interim progress will be made.

Market Transformation Plan

1. Identification of target market, competitors, and distribution channels for proposed technology along with known or perceived barriers to market penetration, including mitigation plan; and
2. Comprehensiveness of market transformation plan including but not limited to product development and/or service plan, commercialization timeline, financing, product marketing, legal/regulatory considerations including intellectual property, infrastructure requirements, Open-Source Software Distribution Plan, etc., and product distribution.
3. Extent of industry adoption, commitments, and interest of the technology/processes.

Criterion 3: Team and Resources (15%)

This criterion involves consideration of the following factors:

1. Capability of the project manager(s) and the proposed team to address all aspects of the proposed work with a high probability of success. The qualifications, relevant expertise, and time commitment of the individuals on the team;
2. Diversity of expertise and perspectives of the team and the inclusion of industry partners that will amplify impact;
3. Sufficiency of the facilities to support the work;
4. Degree to which the proposed consortia/team demonstrates the ability to facilitate and expedite further demonstration, development, and commercial deployment of the proposed technologies;
5. Level of participation by project participants as evidenced by letter(s) of commitment and how well they are integrated into the Workplan; and
6. Reasonableness of the budget and spend plan for the proposed project and objectives.

Criterion 4: Community Benefits Plan (R&D) (15%)

This criterion involves consideration of the following factors:

Diversity, Equity, Inclusion, and Accessibility

1. Clear articulation of the project's goals related to diversity, equity, inclusion, and accessibility;
2. Quality of the project's DEIA goals, as measured by the goals' depth, breadth, likelihood of success, inclusion of appropriate and relevant SMART milestones, and overall project integration;
3. Degree of commitment and ability to track progress toward meeting each of the DEIA goals; and
4. Extent of engagement of organizations that represent disadvantaged communities or underrepresented populations as a core element of their mission, including Minority Serving Institutions (MSIs), underrepresented businesses, and Tribal, nonprofit, or community-based organizations.

The Justice40 Initiative and other considerations linked with energy and environmental justice

1. Clear workplan tasks, staffing, research, and timeline for advancing energy justice and engaging communities with environmental justice concerns and/or evaluating the possible near- and long-term implications of the project for the benefit of the American public, including but not limited to public health and public prosperity benefits;
2. Approach, methodology, and expertise articulated in the plan for addressing energy and environmental justice questions or concerns associated with the technology innovation;
3. Description of how the project will advance the Justice40 Initiative's goal of having 40% of the overall benefits of covered investments flow to disadvantaged communities; and
4. Likelihood that the plan will result in improved understanding of distributional public benefits and costs related to the innovation if successful.

Quality Jobs

1. Clear and comprehensive workplan tasks, staffing, research, and timeline for engaging workforce stakeholders and/or evaluating the possible near- and long-term implications of the project for the U.S. workforce;
2. Approach to document the knowledge, skills, and abilities of the workforce required for successful commercial deployment of innovations resulting from this research; and
3. Likelihood that the plan will result in improved understanding of the workforce implications related to the innovation if successful.

3. Criteria for Replies to Reviewer Comments

DOE has not established separate criteria to evaluate Replies to Reviewer Comments. Instead, Replies to Reviewer Comments are attached to the original applications and evaluated as an extension of the application.

D. Other Selection Factors

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

1. The degree to which the proposed project exhibits technological diversity when compared to the existing DOE project portfolio and other projects selected from the subject NOFO;
2. The degree to which the proposed project, including proposed cost share, optimizes the use of available DOE funding to achieve programmatic objectives;
3. The level of industry involvement and demonstrated ability to accelerate demonstration and commercialization and overcome key market barriers;
4. The degree to which the proposed project is likely to lead to increased high-quality employment and manufacturing in the United States;
5. The degree to which the proposed project will accelerate transformational technological advances in areas that industry by itself is not likely to undertake because of technical and financial uncertainty;
6. The degree to which the proposed project, or group of projects, represent a desired geographic distribution (considering past awards and current applications);
7. The degree to which the proposed project incorporates applicant or team members from Minority Serving Institutions; and partnerships with businesses majority owned or controlled by underrepresented persons or groups of underrepresented persons or Indian Tribes;
8. The degree to which the proposed project, when compared to the existing DOE project portfolio and other projects to be selected from the subject NOFO, contributes to the total portfolio meeting the goals reflected in the Community Benefits Plan criteria; and
9. The degree to which the proposed project will employ procurement of U.S. iron, steel, manufactured products, and construction materials.
10. The degree to which the proposed project contributes to the diversity of organizations and organization types and sizes selected from the subject NOFO when compared to the existing DOE project portfolio.
11. The degree to which the proposed project has broad public support from the communities most directly impacted by the project.
12. The degree to which the proposed project avoids duplication/overlap with other publicly or privately funded work.
13. The degree to which the proposed project supports complementary efforts or projects, which, when taken together, will best achieve the research goals and objectives.
14. The degree to which the proposed project enables new and expanding market segments.
15. The degree to which the project's solution or strategy will maximize deployment or replication.
16. The degree to which the project promotes increased coordination with nongovernmental entities for demonstration of technologies and research applications to facilitate technology transfer.

VII. Selection and Award Notices

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

VIII. Award Administration Information

A. Post-Award Requirements and Administration

DOE requires all award recipients to follow and accept requirements governed by laws and policies – both federal government-wide and DOE or program specific. These post-award requirements include all National and Administrative Policy Requirements; financial assistance general Certifications and Representations; Build America, Buy America requirements; Davis-Bacon Act requirements; Bipartisan Infrastructure Law-Specific Requirements; Fraud, Waste and Abuse requirements; and Safety, Security, and Regulatory requirements. In addition, before DOE finalizes a conditional commitment, DOE must complete Environmental Review in Accordance with National Environmental Policy Act requirements.

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

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

Notice of Bipartisan Infrastructure Law OR Inflation Reduction Act Specific Requirements	NOFO Part 2
Implementation of Executive Order 13798, Promoting Free Speech and Religious Liberty	NOFO Part 2
Affirmative Action and Pay Transparency Requirements	NOFO Part 2
Construction Signage	NOFO Part 2
Real Property and Equipment	NOFO Part 1
Cybersecurity Plan	NOFO Part 1
Rights in Technical Data	NOFO Part 1

1. Real Property and Equipment

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

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

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

2. Cybersecurity Plan

In accordance with BIL section 40126, applicants selected for award negotiations must submit a cybersecurity plan to DOE prior to receiving funding.[22] These plans are intended to foster a cybersecurity-by-design approach for BIL efforts. The Department will use these plans to ensure effective integration and coordination across its research, development, and demonstration programs. A cybersecurity plan is **not** required as part of the application submission for this NOFO, but all projects selected under this NOFO will be required to submit a cybersecurity plan during the award negotiation phase.

DOE recommends using open guidance and standards, such as the National Institute of Standards and Technology's (NIST) Cybersecurity Framework (CSF) and the DOE Cybersecurity Capability Maturity

[22] 42 U.S.C. § 18725

Model (C2M2).[23] The cybersecurity plan created pursuant to BIL section 40126 should document any deviation from open standards, as well as the utilization of proprietary standards where the awardee determines that such deviation is necessary.

Please note:

- Cybersecurity plans should be commensurate to the threats and vulnerabilities associated with the proposed efforts and demonstrate the cybersecurity maturity of the project.
- Cybersecurity plans may cover a range of topics relevant to the proposed project—e.g., software development lifecycle, third-party risks, and incident reporting.
- At a minimum, cybersecurity plans should address questions noted in BIL section 40126 (b), Contents of Cybersecurity Plan.[24]

Supplementary guidance on the cybersecurity plan requirement is available at https://www.energy.gov/ceser/bipartisan-infrastructure-law-implementation.

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.

Topic Areas 1 and 2 Only:
Government Rights in Technical Data Produced Under Awards: The U.S. government normally retains unlimited rights in technical data produced under government financial assistance awards, including the right to distribute to the public. However, pursuant to special statutory authority, certain categories of data generated under DOE awards under this NOFO may be protected from public disclosure for up to five years after the data is generated ("Protected Data"). For awards permitting Protected Data, the protected data must be marked as set forth in the award's intellectual property terms and conditions and a listing of unlimited rights data (i.e., non-protected data) must be inserted into the data clause in the award. In addition, invention disclosures may be protected from public disclosure for a reasonable time in order to allow for filing a patent application.

Topic Area 3 Only:

[23] NERC critical infrastructure protection (CIP) standards for entities responsible for the availability and reliability of the bulk electric system. NIST IR 7628: 2 Smart grid cyber security strategy and requirements. NIST SP800-53, Recommended Security Controls for Federal Information Systems and Organizations: Catalog of security controls in 18 categories, along with profiles for low-, moderate-, and high-impact systems. NIST SP800-82, Guide to Industrial Control Systems (ICS) Security. NIST SP800-39, Integrated Enterprise-Wide Risk Management: Organization, mission, and information system view. AMI System Security Requirements: Security requirements for advanced metering infrastructure. ISO (International Organization for Standardization) 27001, Information Security Management Systems: Guidance on establishing governance and control over security activities (this document must be purchased). IEEE (Institute of Electrical and Electronics Engineers) 1686-2007, Standard for Substation Intelligent Electronic Devices (IEDs) Cyber Security Capabilities (this document must be purchased). DOE Cybersecurity Capability Maturity Model (C2M2).
[24] 42 U.S.C. § 18725

Government Rights in Technical Data Produced Under Awards: The U.S. government retains unlimited rights in technical data produced under government financial assistance awards, including the right to distribute to the public. One exception to the foregoing is that invention disclosures may be protected from public disclosure for a reasonable time in order to allow for filing a patent application.

3. Cost Share Payment

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

B. Helpful Websites

Office of Energy Efficiency & Renewable Energy | Department of Energy EERE Application Process

Clean Energy Infrastructure- Community Benefits Plans

C. 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 WETOFOA@ee.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. **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 *EERE-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.

1. TEA/LCA Resource

The following resource provides basic information on life cycle assessment (LCA) and techno-economic assessment (TEA).

Life cycle analysis and techno-economic analysis training [USDOE]
This series of short videos provide trainings on best practices for conducting LCA and TEA analysis. Produced by the Advanced Materials and Manufacturing Technologies Office (AMMTO) and Industrial Efficiency and Decarbonization Office (IEDO) at USDOE.
Life Cycle Assessment and Techno-Economic Analysis Training | Department of Energy